

Scenario Worksheet

Practice and Scenario Description:

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|---------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Environmental Engineering |
| Practice Code/Name | 359 - Waste Treatment Lagoon |
| Scenario ID | 1 |
| Scenario Name | Waste Treatment Lagoon |
| Scenario Description | <p>A waste treatment lagoon is a component of a waste management system that provides biological treatment of manure and other byproducts of agricultural operations by reducing the pollution potential. Resource concern addressed is water quality by reducing the pollution potential to surface and groundwater by treating and storing liquid waste. Earthen lagoon liners are addressed with another standard.</p> <p>Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), and Solid/Liquid Waste Separation Facility (632).</p> |
| Before Practice Situation | Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and/or other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. |
| After Practice Situation | A waste treatment lagoon constructed from on-site material provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing and treating waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical design size : Design Volume 439,440 ft ³ ; 260' X 208' (top); 3:1 inside and outside side slopes; cut/fill ratio = 1.25; total depth = 13'; 1' freeboard (not included in design volume) |
| Scenario Feature Measure | Design Storage Volume |
| Scenario Unit | Cubic Foot |
| Scenario Typical Size | 439,440 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$26.80 | \$0.00 |
| Equipment/Installation | \$67,384.63 | \$0.15 |
| Labor | \$0.00 | \$0.00 |
| Mobilization | \$1,519.12 | \$0.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$68,930.55 | \$0.16 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|--|------------|-----------------|----------|-------------|
| Materials | 1120 | "Structural steel tubing, 2"" diameter" | "Structural steel tubing, 2"" diameter, 1/8"" wall thickness, materials only" | Foot | \$3.35 | 8 | \$26.80 |
| Equipment/Installation | 1223 | Excavation, common earth, large equipment, 150 ft | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yard | \$3.26 | 9125 | \$29,747.50 |
| Equipment/Installation | 1199 | Stripping and stockpiling, topsoil | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | \$0.77 | 1389 | \$1,069.53 |
| Equipment/Installation | 51 | Earthfill, Dumped and Spread | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic yard | \$3.18 | 8101 | \$25,761.18 |
| Equipment/Installation | 49 | Earthfill, Roller Compacted | Earthfill, roller or machine compacted, includes equipment and labor | Cubic yard | \$3.89 | 2778 | \$10,806.42 |
| Mobilization | 1140 | Mobilization, large equipment | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | \$379.78 | 4 | \$1,519.12 |

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Practice and Scenario Description:

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|---------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agricultural Engineering |
| Practice Code/Name | 362 - Diversion |
| Scenario ID | 4 |
| Scenario Name | Diversion |
| Scenario Description | Typical scenario is for the construction of a diversion or the rebuild of an existing diversion to function as an earthen channel constructed across long slopes with supporting ridge on lower side, to divert runoff away from farmsteads, agricultural waste systems, gullies, critical erosion areas, construction areas or other sensitive areas. Outlet may be waterway, underground outlet, or other suitable outlet. Channel may be level or gradient and ridge may be vegetated or farmed. The quantity of excavation and fill is balanced. |
| Before Practice Situation | Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated. |
| After Practice Situation | Diversion is installed using a dozer. Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Underground Outlet (620), Mulching (484), and Subsurface Drainage (606). |
| Scenario Feature Measure | Diversion Fill Volume |
| Scenario Unit | Cubic Yard |
| Scenario Typical Size | 1000 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|-------------------|--------------------|
| Materials | \$0.00 | \$0.00 |
| Equipment/Installation | \$2,980.00 | \$2.98 |
| Labor | \$112.88 | \$0.11 |
| Mobilization | \$406.10 | \$0.41 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$3,498.98 | \$3.50 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|--|--|------------|-----------------|----------|------------|
| Equipment/Installation | 1199 | Stripping and stockpiling, topsoil | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | \$0.77 | 1000 | \$770.00 |
| Equipment/Installation | 1220 | Excavation, common earth, small equipment, 50 ft | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yard | \$2.21 | 1000 | \$2,210.00 |
| Labor | 234 | Supervisor or Manager | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | \$36.52 | 2 | \$73.04 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 2 | \$39.84 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 2 | \$406.10 |

Scenario Worksheet

Practice and Scenario Description:

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| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agricultural Engineering |
| Practice Code/Name | 362 - Diversion |
| Scenario ID | 3 |
| Scenario Name | Diversion - Large (≥3 CY/FT) |
| Scenario Description | An earthen channel constructed across long slopes with supporting ridge on lower side, to divert runoff away from farmsteads, agricultural waste systems, gullies, critical erosion areas, construction areas or other sensitive areas. Outlet may be waterway, underground outlet, or other suitable outlet. Scenario is for diversions requiring greater than or equal to 3 CY of excavation per foot of diversion. Channel may be level or gradient and ridge may be vegetated or farmed. The quantity of excavation and fill is balanced. |
| Before Practice Situation | Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated. |
| After Practice Situation | Diversion is 1000 feet long installed using a dozer. Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Underground Outlet (620), Mulching (484), and Subsurface Drainage (606). |
| Scenario Feature Measure | Length of Diversion |
| Scenario Unit | Linear Foot |
| Scenario Typical Size | 1000 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$0.00 | \$0.00 |
| Equipment/Installation | \$8,505.00 | \$8.51 |
| Labor | \$112.88 | \$0.11 |
| Mobilization | \$406.10 | \$0.41 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$9,023.98 | \$9.02 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|--|--|------------|-----------------|----------|------------|
| Equipment/Installation | 1199 | Stripping and stockpiling, topsoil | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | \$0.77 | 1000 | \$770.00 |
| Equipment/Installation | 1220 | Excavation, common earth, small equipment, 50 ft | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yard | \$2.21 | 3500 | \$7,735.00 |
| Labor | 234 | Supervisor or Manager | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | \$36.52 | 2 | \$73.04 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 2 | \$39.84 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 2 | \$406.10 |

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Practice and Scenario Description:

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| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agricultural Engineering |
| Practice Code/Name | 362 - Diversion |
| Scenario ID | 2 |
| Scenario Name | Diversion - Medium (2-2.9 CY/FT) |
| Scenario Description | An earthen channel constructed across long slopes with supporting ridge on lower side, to divert runoff away from farmsteads, agricultural waste systems, gullies, critical erosion areas, construction areas or other sensitive areas. Outlet may be waterway, underground outlet. or other suitable outlet. Scenario is for diversions requiring 2 CY to 2.9 CY of excavation per foot of diversion. Channel may be level or gradient and ridge may be vegetated or farmed. The quantity of excavation and fill is balanced. |
| Before Practice Situation | Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated. |
| After Practice Situation | Diversion is 1000 feet long installed using a dozer. Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Underground Outlet (620), Mulching (484), and Subsurface Drainage (606). |
| Scenario Feature Measure | Length of Diversion |
| Scenario Unit | Linear Foot |
| Scenario Typical Size | 1000 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|-------------------|--------------------|
| Materials | \$0.00 | \$0.00 |
| Equipment/Installation | \$6,295.00 | \$6.30 |
| Labor | \$112.88 | \$0.11 |
| Mobilization | \$406.10 | \$0.41 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$6,813.98 | \$6.81 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|--|--|------------|-----------------|----------|------------|
| Equipment/Installation | 1199 | Stripping and stockpiling, topsoil | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | \$0.77 | 1000 | \$770.00 |
| Equipment/Installation | 1220 | Excavation, common earth, small equipment, 50 ft | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yard | \$2.21 | 2500 | \$5,525.00 |
| Labor | 234 | Supervisor or Manager | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | \$36.52 | 2 | \$73.04 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 2 | \$39.84 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 2 | \$406.10 |

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Practice and Scenario Description:

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|---------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agricultural Engineering |
| Practice Code/Name | 362 - Diversion |
| Scenario ID | 1 |
| Scenario Name | Diversion - Small (<2CY/FT) |
| Scenario Description | An earthen channel constructed across long slopes with supporting ridge on lower side, to divert runoff away from farmsteads, agricultural waste systems, gullies, critical erosion areas, construction areas or other sensitive areas. Outlet may be waterway, underground outlet. or other suitable outlet. Scenario is for diversions requiring less than 2 CY of excavation per foot of diversion. Channel may be level or gradient and ridge may be vegetated or farmed. The quantity of excavation and fill is balanced. |
| Before Practice Situation | Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated. |
| After Practice Situation | Diversion is 1000 feet long installed using a dozer. Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Underground Outlet (620), Mulching (484), and Subsurface Drainage (606). |
| Scenario Feature Measure | Length of Diversion |
| Scenario Unit | Linear Feet |
| Scenario Typical Size | 1000 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|-------------------|--------------------|
| Materials | \$0.00 | \$0.00 |
| Equipment/Installation | \$2,595.00 | \$2.60 |
| Labor | \$112.88 | \$0.11 |
| Mobilization | \$406.10 | \$0.41 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$3,113.98 | \$3.11 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|--|--|------------|-----------------|----------|------------|
| Equipment/Installation | 1199 | Stripping and stockpiling, topsoil | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | \$0.77 | 500 | \$385.00 |
| Equipment/Installation | 1220 | Excavation, common earth, small equipment, 50 ft | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yard | \$2.21 | 1000 | \$2,210.00 |
| Labor | 234 | Supervisor or Manager | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | \$36.52 | 2 | \$73.04 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 2 | \$39.84 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 2 | \$406.10 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Environmental Engineering |
| Practice Code/Name | 366 - Anaerobic Digester |
| Scenario ID | 4 |
| Scenario Name | Small Complete Mix <1000 AU |
| Scenario Description | A complete mix anaerobic digester that is part of a waste management system for the biological treatment of the waste in the absence of oxygen. This process for manure and other byproducts of animal agricultural operations will manage odors, reduce the net effect of greenhouse gas emissions, and/or reduce pathogens. This scenario is for complete mix systems with less than 1,000 animal units. Energy generation is not included with this scenario. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313). |
| Before Practice Situation | Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters, in addition to the use of excessive amounts of fertilizers. The treatment of manure and other agricultural by-products is desired in order to manage odors, and/or reduce pathogens. |
| After Practice Situation | Manure and other agricultural by-products are being treated such that odors are managed and/or pathogens are reduced. Effluent from the digester is disposed of or utilized in a proper manner in accordance with a nutrient management plan. A complete mix digester is typically a round above ground structure constructed of concrete or steel. The typical scenario also includes items necessary to maintain mesophilic or thermophilic temperatures for bacterial activity (i.e. piping and boiler or other heat source). Typical Design Scenario: 910 animal units (650 - 1,400 lbs dairy cows). |
| Scenario Feature Measure | Animals Units Contributing to Digester |
| Scenario Unit | Animal Unit |
| Scenario Typical Size | 910 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$695,990.00 | \$764.82 |
| Equipment/Installation | \$0.00 | \$0.00 |
| Labor | \$0.00 | \$0.00 |
| Mobilization | \$1,278.10 | \$1.40 |
| Acquisition of Technical Knowledge | \$233.34 | \$0.26 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$697,501.44 | \$766.49 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------------------|--------------|---|--|------|-----------------|----------|--------------|
| Materials | 1649 | Complete Mix Digester, small | A complete mix flow anaerobic digester includes the containment facility, agitation or stirring equipment, and any necessary reception and mixing tanks (<1000 AU). Sized for smaller livestock operations (<1000 AU). Includes labor and equipment. | Each | \$393,903.00 | 1 | \$393,903.00 |
| Materials | 1650 | Complete Mix Heat Piping System, small | Piping installed in and/or around the digester for circulating heated liquid to maintain the necessary temperatures for efficient digester operation (<1000 AU). Includes labor and equipment. | Each | \$138,494.00 | 1 | \$138,494.00 |
| Materials | 1651 | Complete Mix Gas Collection System, small | Piping and collection system for biogas (<1000 AU). Includes labor and equipment. | Each | \$38,221.00 | 1 | \$38,221.00 |
| Materials | 2019 | Boiler | Typical boiler needed to maintain digester temperature. | Each | \$21,900.00 | 1 | \$21,900.00 |
| Materials | 1653 | Complete Mix Flare, small | Flare excess gas to convert from methane to carbon dioxide (<1000 AU). Includes labor and equipment. | Each | \$12,313.00 | 1 | \$12,313.00 |
| Materials | 1652 | Complete Mix Control Building, small | Controls for operating digester and boiler system (<1000 AU). Includes labor and equipment. | Each | \$91,159.00 | 1 | \$91,159.00 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 2 | \$406.10 |
| Mobilization | 1140 | Mobilization, large equipment | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | \$379.78 | 2 | \$759.56 |
| Mobilization | 1137 | Mobilization, very small equipment | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | \$56.22 | 2 | \$112.44 |
| Acquisition of Technical Knowledge | 294 | Training, Workshops | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | \$116.67 | 2 | \$233.34 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Environmental Engineering |
| Practice Code/Name | 366 - Anaerobic Digester |
| Scenario ID | 5 |
| Scenario Name | Medium Complete Mix 1000-2500 AU |
| Scenario Description | <p>A complete mix anaerobic digester that is part of a waste management system for the biological treatment of the waste in the absence of oxygen. This process for manure and other byproducts of animal agricultural operations will manage odors, reduce the net effect of greenhouse gas emissions, and/or reduce pathogens. This scenario is for complete mix systems between 1,000 and 2,500 animal units. Energy generation is not included with this scenario.</p> <p>Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).</p> |
| Before Practice Situation | Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters, in addition to the use of excessive amounts of fertilizers. The treatment of manure and other agricultural by-products is desired in order to manage odors, and/or reduce pathogens. |
| After Practice Situation | Manure and other agricultural by-products are being treated such that odors are managed and/or pathogens are reduced. Effluent from the digester is disposed of or utilized in a proper manner in accordance with a nutrient management plan. A complete mix digester is typically a round above ground structure constructed of concrete or steel. The typical scenario also includes items necessary to maintain mesophilic or thermophilic temperatures for bacterial activity (i.e. piping and boiler or other heat source). Typical Design Scenario: 1,890 animal units (1,350 - 1,400 lbs dairy cows). |
| Scenario Feature Measure | Animals Units Contributing to Digester |
| Scenario Unit | Animal Unit |
| Scenario Typical Size | 1,890 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$801,389.00 | \$424.02 |
| Equipment/Installation | \$0.00 | \$0.00 |
| Labor | \$0.00 | \$0.00 |
| Mobilization | \$1,684.20 | \$0.89 |
| Acquisition of Technical Knowledge | \$233.34 | \$0.12 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$803,306.54 | \$425.03 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------------------|--------------|--|---|------|-----------------|----------|--------------|
| Materials | 1658 | Complete Mix Flare, medium | Flare excess gas to convert from methane to carbon dioxide (1000-2000 AU). Includes labor and equipment. | Each | \$12,313.00 | 1 | \$12,313.00 |
| Materials | 1657 | Complete Mix Control Building, medium | Controls for operating digester and boiler system (1000-2000 AU). Includes labor and equipment. | Each | \$91,159.00 | 1 | \$91,159.00 |
| Materials | 2019 | Boiler | Typical boiler needed to maintain digester temperature. | Each | \$21,900.00 | 1 | \$21,900.00 |
| Materials | 1656 | Complete Mix Gas Collection System, medium | Piping and collection system for biogas. Includes labor and equipment (1000-2000 AU). | Each | \$40,273.00 | 1 | \$40,273.00 |
| Materials | 1655 | Complete Mix Heat Piping System, medium | Piping installed in and/or around the digester for circulating heated liquid to maintain the necessary temperatures for efficient digester operation (1000-2000 AU). Includes labor and equipment. | Each | \$191,680.00 | 1 | \$191,680.00 |
| Materials | 1654 | Complete Mix Digester, medium | A complete mix flow anaerobic digester includes the containment facility, agitation or stirring equipment, and any necessary reception and mixing tanks (1000-2000 AU). Sized for medium sized livestock operations (1000-2500 AU). Includes labor and equipment. | Each | \$444,064.00 | 1 | \$444,064.00 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 4 | \$812.20 |
| Mobilization | 1140 | Mobilization, large equipment | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | \$379.78 | 2 | \$759.56 |
| Mobilization | 1137 | Mobilization, very small equipment | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | \$56.22 | 2 | \$112.44 |
| Acquisition of Technical Knowledge | 294 | Training, Workshops | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | \$116.67 | 2 | \$233.34 |

Scenario Worksheet

Practice and Scenario Description:

| Information Type | Data |
|---------------------------|--|
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Environmental Engineering |
| Practice Code/Name | 366 - Anaerobic Digester |
| Scenario ID | 6 |
| Scenario Name | Large Complete Mix >2,500 AU |
| Scenario Description | <p>A complete mix anaerobic digester that is part of a waste management system for the biological treatment of the waste in the absence of oxygen. This process for manure and other byproducts of animal agricultural operations will manage odors, reduce the net effect of greenhouse gas emissions, and/or reduce pathogens. This scenario is for complete mix systems with more than 2,500 animal units. Energy generation is not included with this scenario.</p> <p>Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).</p> |
| Before Practice Situation | Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters, in addition to the use of excessive amounts of fertilizers. The treatment of manure and other agricultural by-products is desired in order to manage odors, and/or reduce pathogens. |
| After Practice Situation | Manure and other agricultural by-products are being treated such that odors are managed and/or pathogens are reduced. Effluent from the digester is disposed or utilized in a proper manner in accordance with a nutrient management plan. A complete mix digester is typically a round above ground structure constructed of concrete or steel. The typical scenario also includes items necessary to maintain mesophilic or thermophilic temperatures for bacterial activity (i.e. piping and boiler or other heat source). Typical Design Scenario: 3,220 animal units (2,300 - 1,400 lbs dairy cows). |
| Scenario Feature Measure | Animals Units Contributing to Digester |
| Scenario Unit | Animal Unit |
| Scenario Typical Size | 3,220 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|----------------|--------------------|
| Materials | \$1,047,190.00 | \$325.21 |
| Equipment/Installation | \$0.00 | \$0.00 |
| Labor | \$0.00 | \$0.00 |
| Mobilization | \$2,090.30 | \$0.65 |
| Acquisition of Technical Knowledge | \$233.34 | \$0.07 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$1,049,513.64 | \$325.94 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------------------|--------------|---|--|------|-----------------|----------|--------------|
| Materials | 1663 | Complete Mix Flare, large | Flare excess gas to convert from methane to carbon dioxide (>2000 AU). Includes labor and equipment. | Each | \$19,495.00 | 1 | \$19,495.00 |
| Materials | 1659 | Complete Mix Digester, large | A complete mix flow anaerobic digester includes the containment facility, agitation or stirring equipment, and any necessary reception and mixing tanks (>2000 AU). Sized for large livestock operations (>2500 AU). Includes labor and equipment. | Each | \$536,018.00 | 1 | \$536,018.00 |
| Materials | 1662 | Complete Mix Control Building, large | Controls for operating digester and boiler system (>2000 AU). Includes labor and equipment. | Each | \$157,853.00 | 1 | \$157,853.00 |
| Materials | 1660 | Complete Mix Heat Piping System, large | Piping installed in and/or around the digester for circulating heated liquid to maintain the necessary temperatures for efficient digester operation (>2000 AU). Includes labor and equipment. | Each | \$236,764.00 | 1 | \$236,764.00 |
| Materials | 2019 | Boiler | Typical boiler needed to maintain digester temperature. | Each | \$21,900.00 | 1 | \$21,900.00 |
| Materials | 1661 | Complete Mix Gas Collection System, large | Piping and collection system for biogas (>2000 AU). Includes labor and equipment. | Each | \$75,160.00 | 1 | \$75,160.00 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 6 | \$1,218.30 |
| Mobilization | 1140 | Mobilization, large equipment | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | \$379.78 | 2 | \$759.56 |
| Mobilization | 1137 | Mobilization, very small equipment | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | \$56.22 | 2 | \$112.44 |
| Acquisition of Technical Knowledge | 294 | Training, Workshops | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | \$116.67 | 2 | \$233.34 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Environmental Engineering |
| Practice Code/Name | 366 - Anaerobic Digester |
| Scenario ID | 7 |
| Scenario Name | Covered Lagoon/Holding Pond |
| Scenario Description | A covered lagoon that is part of a waste management system to provide biological treatment of the waste in the absence of oxygen. This process for manure and other byproducts of animal agricultural operations will manage odors, reduce the net effect of greenhouse gas emissions, and/or reduce pathogens. This scenario is for all livestock operation sizes. The application can be to retrofit an existing anaerobic lagoon, or as an addition to a new construction using waste treatment lagoon (359) or waste storage facility (313), and roofs and covers (367). Costs for this scenario are only for system controls, gas collection, and flaring system. Energy generation is not included with this scenario. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313). |
| Before Practice Situation | Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters, in addition to the use of excessive amounts of fertilizers. The treatment of manure and other agricultural by-products is desired in order to manage odors, and/or reduce pathogens. |
| After Practice Situation | Manure and other agricultural by-products are being treated such that odors are managed and/or pathogens are reduced. Effluent from the digester is disposed of or utilized in a proper manner in accordance with a nutrient management plan. A covered lagoon/holding pond typically has a flexible top installed over an earthen storage/treatment facility for the purpose of capturing the biogas. Typical Design Scenario: 1,000 animal units (715 - 1,400 lbs dairy cows). |
| Scenario Feature Measure | Animals Units Contributing to Digester |
| Scenario Unit | Animal Unit |
| Scenario Typical Size | 1,000 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|--------------------|--------------------|
| Materials | \$88,755.00 | \$88.76 |
| Equipment/Installation | \$0.00 | \$0.00 |
| Labor | \$0.00 | \$0.00 |
| Mobilization | \$518.54 | \$0.52 |
| Acquisition of Technical Knowledge | \$116.67 | \$0.12 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$89,390.21 | \$89.39 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------------------|--------------|--------------------------------------|--|------|-----------------|----------|-------------|
| Materials | 1666 | Covered Lagoon Flare | Flare excess gas to convert from methane to carbon dioxide. Includes labor and equipment. | Each | \$12,313.00 | 1 | \$12,313.00 |
| Materials | 1665 | Covered Lagoon Control Building | Controls for operating the digester system. Includes labor and equipment. | Each | \$38,221.00 | 1 | \$38,221.00 |
| Materials | 1664 | Covered Lagoon Gas Collection System | Piping and collection system for biogas. Includes labor and equipment. | Each | \$38,221.00 | 1 | \$38,221.00 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 2 | \$406.10 |
| Mobilization | 1137 | Mobilization, very small equipment | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | \$56.22 | 2 | \$112.44 |
| Acquisition of Technical Knowledge | 294 | Training, Workshops | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | \$116.67 | 1 | \$116.67 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Environmental Engineering |
| Practice Code/Name | 366 - Anaerobic Digester |
| Scenario ID | 1 |
| Scenario Name | Small Plug Flow <1000 AU |
| Scenario Description | <p>A plug flow anaerobic digester that is part of a waste management system for the biological treatment of the waste in the absence of oxygen. This process for manure and other byproducts of animal agricultural operations will manage odors, reduce the net effect of greenhouse gas emissions, and/or reduce pathogens. This scenario is for a plug flow digester with less than 1,000 animal units. Energy generation is not included with this scenario.</p> <p>Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).</p> |
| Before Practice Situation | Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters, in addition to the use of excessive amounts of fertilizers. The treatment of manure and other agricultural by-products is desired in order to manage odors, and/or reduce pathogens. |
| After Practice Situation | Manure and other agricultural by-products are being treated such that odors are managed and/or pathogens are reduced. Effluent from the digester is disposed or utilized in a proper manner in accordance with a nutrient management plan. A plug flow digester is typically constructed of concrete with vertical side walls and solid or flexible top. The typical scenario also includes items necessary to maintain mesophilic or thermophilic temperatures for bacterial activity (i.e. piping and boiler or other heat source). Typical Design Scenario: 910 animal units (650 - 1,400 lbs dairy cows). |
| Scenario Feature Measure | Animals Units Contributing to Digester |
| Scenario Unit | Animal Unit |
| Scenario Typical Size | 910 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$302,087.00 | \$331.96 |
| Equipment/Installation | \$316,874.00 | \$348.21 |
| Labor | \$0.00 | \$0.00 |
| Mobilization | \$1,278.10 | \$1.40 |
| Acquisition of Technical Knowledge | \$233.34 | \$0.26 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$620,472.44 | \$681.84 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------------------|--------------|--|--|------|-----------------|----------|--------------|
| Materials | 1635 | Plug Flow Heat Piping System, small | Piping installed in and/or around the digester for circulating heated liquid to maintain the necessary temperatures for efficient digester operation (<1000 AU). Includes labor and equipment. | Each | \$138,494.00 | 1 | \$138,494.00 |
| Materials | 1638 | Plug Flow Flare, small | Flare excess gas to convert from methane to carbon dioxide (<1000 AU). Includes labor and equipment. | Each | \$12,313.00 | 1 | \$12,313.00 |
| Materials | 1637 | Plug Flow Control Building, small | Controls for operating digester and boiler system (<1000 AU). Includes labor and equipment. | Each | \$91,159.00 | 1 | \$91,159.00 |
| Materials | 1636 | Plug Flow Gas Collection System, small | Piping and collection system for biogas (<1000 AU). Includes labor and equipment. | Each | \$38,221.00 | 1 | \$38,221.00 |
| Materials | 2019 | Boiler | Typical boiler needed to maintain digester temperature. | Each | \$21,900.00 | 1 | \$21,900.00 |
| Equipment/Installation | 1634 | Small Plug Flow Digester | Concrete plug flow anaerobic digester which includes poured walls, floor and top. Sized for smaller livestock operations (<1000 AU). Also included are any necessary reception and mixing tanks. Includes labor and equipment. | Each | \$316,874.00 | 1 | \$316,874.00 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 2 | \$406.10 |
| Mobilization | 1140 | Mobilization, large equipment | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | \$379.78 | 2 | \$759.56 |
| Mobilization | 1137 | Mobilization, very small equipment | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | \$56.22 | 2 | \$112.44 |
| Acquisition of Technical Knowledge | 294 | Training, Workshops | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | \$116.67 | 2 | \$233.34 |

Scenario Worksheet

Practice and Scenario Description:

| Information Type | Data |
|---------------------------|---|
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Environmental Engineering |
| Practice Code/Name | 366 - Anaerobic Digester |
| Scenario ID | 2 |
| Scenario Name | Medium Plug Flow 1000-2000 AU |
| Scenario Description | <p>A plug flow anaerobic digester that is part of a waste management system for the biological treatment of the waste in the absence of oxygen. This process for manure and other byproducts of animal agricultural operations will manage odors, reduce the net effect of greenhouse gas emissions, and/or reduce pathogens. This scenario is for plug flow digesters with livestock operations between 1,000 and 2,000 animal units. Energy generation is not included with this scenario.</p> <p>Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).</p> |
| Before Practice Situation | Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters, in addition to the use of excessive amounts of fertilizers. The treatment of manure and other agricultural by-products is desired in order to manage odors, and/or reduce pathogens. |
| After Practice Situation | Manure and other agricultural by-products are being treated such that odors are managed and/or pathogens are reduced. Effluent from the digester is disposed or utilized in a proper manner in accordance with a nutrient management plan. A plug flow digester is typically constructed of concrete with vertical side walls and solid or flexible top. The typical scenario also includes items necessary to maintain mesophilic or thermophilic temperatures for bacterial activity (i.e. piping and boiler or other heat source). Typical design scenario: 1,750 animal units (1,250 - 1,400 lbs dairy cows). |
| Scenario Feature Measure | Animals Units Contributing to Digester |
| Scenario Unit | Animal Unit |
| Scenario Typical Size | 1,750 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$847,374.00 | \$484.21 |
| Equipment/Installation | \$0.00 | \$0.00 |
| Labor | \$0.00 | \$0.00 |
| Mobilization | \$1,684.20 | \$0.96 |
| Acquisition of Technical Knowledge | \$233.34 | \$0.13 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$849,291.54 | \$485.31 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------------------|--------------|---|---|------|-----------------|----------|--------------|
| Materials | 1643 | Plug Flow Flare, medium | Flare excess gas to convert from methane to carbon dioxide (1000-2000 AU). Includes labor and equipment. | Each | \$12,313.00 | 1 | \$12,313.00 |
| Materials | 1642 | Plug Flow Control Building, medium | Controls for operating digester and boiler system (1000-2000 AU). Includes labor and equipment. | Each | \$91,159.00 | 1 | \$91,159.00 |
| Materials | 1641 | Plug Flow Gas Collection System, medium | Piping and collection system for biogas (1000-2000 AU). Includes labor and equipment. | Each | \$40,273.00 | 1 | \$40,273.00 |
| Materials | 1640 | Plug Flow Heat Piping System, medium | Piping installed in and/or around the digester for circulating heated liquid to maintain the necessary temperatures for efficient digester operation (1000-2000 AU). Includes labor and equipment. | Each | \$191,680.00 | 1 | \$191,680.00 |
| Materials | 1639 | Plug Flow Digester, medium | Concrete plug flow anaerobic digester which includes poured walls, floor and top. Sized for medium sized livestock operations (1000-2000 AU). Also included are any necessary reception and mixing tanks. Includes labor and equipment. | Each | \$490,049.00 | 1 | \$490,049.00 |
| Materials | 2019 | Boiler | Typical boiler needed to maintain digester temperature. | Each | \$21,900.00 | 1 | \$21,900.00 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 4 | \$812.20 |
| Mobilization | 1140 | Mobilization, large equipment | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | \$379.78 | 2 | \$759.56 |
| Mobilization | 1137 | Mobilization, very small equipment | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | \$56.22 | 2 | \$112.44 |
| Acquisition of Technical Knowledge | 294 | Training, Workshops | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | \$116.67 | 2 | \$233.34 |

Scenario Worksheet

Practice and Scenario Description:

| Information Type | Data |
|---------------------------|--|
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Environmental Engineering |
| Practice Code/Name | 366 - Anaerobic Digester |
| Scenario ID | 3 |
| Scenario Name | Large Plug Flow >2000 AU |
| Scenario Description | <p>A plug flow anaerobic digester that is part of a waste management system for the biological treatment of the waste in the absence of oxygen. This process for manure and other byproducts of animal agricultural operations will manage odors, reduce the net effect of greenhouse gas emissions, and/or reduce pathogens. This scenario is for plug flow digesters with more than 2,000 animal units. Energy generation is not included with this scenario.</p> <p>Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).</p> |
| Before Practice Situation | Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters, in addition to the use of excessive amounts of fertilizers. The treatment of manure and other agricultural by-products is desired in order to manage odors, and/or reduce pathogens. |
| After Practice Situation | Manure and other agricultural by-products are being treated such that odors are managed and/or pathogens are reduced. Effluent from the digester is disposed or utilized in a proper manner in accordance with a nutrient management plan. A plug flow digester is typically constructed of concrete with vertical side walls and solid or flexible top. The typical scenario also includes items necessary to maintain mesophilic or thermophilic temperatures for bacterial activity (i.e. piping and boiler or other heat source). Typical Design Scenario: 3,920 animal units (2,800 - 1,400 lbs dairy cows). |
| Scenario Feature Measure | Animals Units Contributing to Digester |
| Scenario Unit | Animal Unit |
| Scenario Typical Size | 3,920 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|----------------|--------------------|
| Materials | \$1,074,815.00 | \$274.19 |
| Equipment/Installation | \$0.00 | \$0.00 |
| Labor | \$0.00 | \$0.00 |
| Mobilization | \$2,090.30 | \$0.53 |
| Acquisition of Technical Knowledge | \$233.34 | \$0.06 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$1,077,138.64 | \$274.78 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------------------|--------------|--|--|------|-----------------|----------|--------------|
| Materials | 1648 | Plug Flow Flare, large | Flare excess gas to convert from methane to carbon dioxide (>2000 AU). Includes labor and equipment. | Each | \$22,943.00 | 1 | \$22,943.00 |
| Materials | 1647 | Plug Flow Control Building, large | Controls for operating digester and boiler system (>2000 AU). Includes labor and equipment. | Each | \$181,896.00 | 1 | \$181,896.00 |
| Materials | 1646 | Plug Flow Gas Collection System, large | Piping and collection system for biogas (>2000 AU). Includes labor and equipment. | Each | \$88,450.00 | 1 | \$88,450.00 |
| Materials | 1645 | Plug Flow Heat Piping System, large | Piping installed in and/or around the digester for circulating heated liquid to maintain the necessary temperatures for efficient digester operation (>2000 AU). Includes labor and equipment. | Each | \$269,577.00 | 1 | \$269,577.00 |
| Materials | 1644 | Plug Flow Digester, large | Concrete plug flow anaerobic digester which includes poured walls, floor and top. Sized for large livestock operations (>2000 AU). Also included are any necessary reception and mixing tanks. Includes labor and equipment. | Each | \$490,049.00 | 1 | \$490,049.00 |
| Materials | 2019 | Boiler | Typical boiler needed to maintain digester temperature. | Each | \$21,900.00 | 1 | \$21,900.00 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 6 | \$1,218.30 |
| Mobilization | 1140 | Mobilization, large equipment | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | \$379.78 | 2 | \$759.56 |
| Mobilization | 1137 | Mobilization, very small equipment | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | \$56.22 | 2 | \$112.44 |
| Acquisition of Technical Knowledge | 294 | Training, Workshops | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | \$116.67 | 2 | \$233.34 |

Scenario Worksheet

Practice and Scenario Description:

| Information Type | Data |
|---------------------------|--|
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Environmental Engineering |
| Practice Code/Name | 367 - Roofs and Covers |
| Scenario ID | 6 |
| Scenario Name | Flexible Membrane Cover |
| Scenario Description | A fabricated rigid, semi-rigid, or flexible membrane over a waste storage or treatment facility. The membrane will cover the entire surface of a waste storage or treatment facility (e.g. waste treatment lagoon or anaerobic digester). Cover will exclude precipitation and/or capture biogas for controlled release for flaring or anaerobic digestion. Associated practices include Waste Storage Facility (313), Waste Treatment Lagoon (359), Anaerobic Digester (366), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), Pumping Plant (533), and Waste Treatment (629). |
| Before Practice Situation | Applicable where the exclusion of precipitation from an animal waste storage or treatment lagoon will improve the management of an existing or planned system, capture and controlled release or flaring of emissions from an existing or planned agricultural waste storage to improve air quality, and/or biogas production and capture for energy use are part of the existing or planned animal waste management system. |
| After Practice Situation | A fabricated rigid, semi-rigid, or flexible membrane over a waste storage or treatment facility. The membrane will cover the entire surface of a waste storage or treatment facility (e.g. waste treatment lagoon or anaerobic digester). Typical size is 3000 square feet. |
| Scenario Feature Measure | Surface of Membrane |
| Scenario Unit | Square Foot |
| Scenario Typical Size | 3,000 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$3,168.00 | \$1.06 |
| Equipment/Installation | \$0.00 | \$0.00 |
| Labor | \$1,819.84 | \$0.61 |
| Mobilization | \$315.49 | \$0.11 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$5,303.33 | \$1.77 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|---------------|--------------|------------------------------------|--|-------------|-----------------|----------|------------|
| Materials | 1387 | Synthetic Liner, 40 mil | Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Materials only. | Square Foot | \$0.72 | 4400 | \$3,168.00 |
| Labor | 232 | Equipment Operators, Light | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | \$22.67 | 16 | \$362.72 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 48 | \$956.16 |
| Labor | 230 | Skilled Labor | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | \$31.31 | 16 | \$500.96 |
| Mobilization | 1137 | Mobilization, very small equipment | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | \$56.22 | 2 | \$112.44 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 1 | \$203.05 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Environmental Engineering |
| Practice Code/Name | 367 - Roofs and Covers |
| Scenario ID | 2 |
| Scenario Name | Hoop Building, >30 Ft Wide |
| Scenario Description | A flexible membrane or fabric-like roof placed on a steel truss hoop-like supports and supporting foundation. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Associated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), and Waste Treatment (629). |
| Before Practice Situation | Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. |
| After Practice Situation | A flexible membrane or fabric-like roof placed on a steel truss hoop-like supports and supporting foundation. Roof or cover will be engineered and installed in accordance with appropriate building codes and permits. Typical size is 7,500 square feet and is over an approved animal waste management facility as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation". |
| Scenario Feature Measure | Footprint of the building |
| Scenario Unit | Square Foot |
| Scenario Typical Size | 7500 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$51,750.00 | \$6.90 |
| Equipment/Installation | \$0.00 | \$0.00 |
| Labor | \$0.00 | \$0.00 |
| Mobilization | \$518.54 | \$0.07 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$52,268.54 | \$6.97 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|---------------|--------------|--|--|-------------|-----------------|----------|-------------|
| Materials | 1668 | Roof, Hoop Truss Arch Structure, 30-60' wide | Hoop Truss Arch Structure with fabric cover - 30' to 60' width, includes materials, equipment, and installation. Does not include foundation preparation. | Square Foot | \$6.90 | 7500 | \$51,750.00 |
| Mobilization | 1137 | Mobilization, very small equipment | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | \$56.22 | 2 | \$112.44 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 2 | \$406.10 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Environmental Engineering |
| Practice Code/Name | 367 - Roofs and Covers |
| Scenario ID | 1 |
| Scenario Name | Hoop Building, <30 ft Wide |
| Scenario Description | A flexible membrane or fabric-like roof placed on a steel truss hoop-like supports and supporting foundation. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Associated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), and Waste Treatment (629). |
| Before Practice Situation | Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. |
| After Practice Situation | A flexible membrane or fabric-like roof placed on a steel truss hoop-like supports and supporting foundation. Roof or cover will be engineered and installed in accordance with appropriate building codes and permits. Typical size is 1,800 square feet and is over an approved animal waste management facility as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation". |
| Scenario Feature Measure | Footprint of the building |
| Scenario Unit | Square Foot |
| Scenario Typical Size | 1,800 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$13,878.00 | \$7.71 |
| Equipment/Installation | \$0.00 | \$0.00 |
| Labor | \$0.00 | \$0.00 |
| Mobilization | \$518.54 | \$0.29 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$14,396.54 | \$8.00 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|---------------|--------------|---|--|-------------|-----------------|----------|-------------|
| Materials | 1667 | Roof, Hoop Truss Arch Structure, less than 30' wide | Hoop Truss Arch Structure with fabric cover - less than 30' width, includes materials, equipment, and installation. Does not include foundation preparation. | Square Foot | \$7.71 | 1800 | \$13,878.00 |
| Mobilization | 1137 | Mobilization, very small equipment | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | \$56.22 | 2 | \$112.44 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 2 | \$406.10 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Environmental Engineering |
| Practice Code/Name | 367 - Roofs and Covers |
| Scenario ID | 7 |
| Scenario Name | Modular Floating Cover |
| Scenario Description | A permeable floating composite cover is deployed on the liquid surface of a 70 foot diameter waste storage facility. The permeable composite cover utilizes fabricated shapes or tiles that fit together to cover a minimum of 90% of the liquid surface of a waste storage facility. The waste storage volume must be documented in the CNMP as adequate to store the waste product and rainfall on the surface of the facility for the intended period without any credit for evaporative loss. Installation of the practice will address air quality by reducing emissions of odors and ammonia. Associated practices include Waste Storage Facility (313), and Waste Treatment Lagoon (359) |
| Before Practice Situation | Applicable where an existing or planned animal waste storage or treatment lagoon is creating significant air quality concerns due to odor problems and the release of ammonia as a fine particulate matter precursor. Installation will improve the management of an existing or planned system to control the release of odors as well as ammonia to improve air quality as part of the existing or planned animal waste management system. |
| After Practice Situation | A permeable modular cover over an animal waste storage or treatment facility. Installation of the modular floating tiles will improve air quality by reducing emissions of odors and ammonia. The typical waste storage structure treated has a liquid surface area of 70 foot diameter, or 3,848 square feet. Associated practices include Waste Storage Facility (313) and Waste Treatment Lagoon (359). |
| Scenario Feature Measure | Surface Area of Liquid Manure Storage Tank |
| Scenario Unit | Square Foot |
| Scenario Typical Size | 3848 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$32,477.12 | \$8.44 |
| Equipment/Installation | \$94.12 | \$0.02 |
| Labor | \$45.34 | \$0.01 |
| Mobilization | \$0.00 | \$0.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$32,616.58 | \$8.48 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|---|-------------|-----------------|----------|-------------|
| Materials | 1683 | Composite Cover, floating tile, ≤ 5,000 square foot | Composite material that is used to cover open storages with an area less than 5,000 sf. Example, Hexa-Cover. Materials only. | Square Foot | \$8.44 | 3848 | \$32,477.12 |
| Equipment/Installation | 962 | Tractor, agricultural, 120 HP | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hour | \$47.06 | 2 | \$94.12 |
| Labor | 232 | Equipment Operators, Light | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | \$22.67 | 2 | \$45.34 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Environmental Engineering |
| Practice Code/Name | 367 - Roofs and Covers |
| Scenario ID | 5 |
| Scenario Name | Steel Frame Building |
| Scenario Description | A steel framed building with steel "sheet" roof and supporting foundation. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Associated practices includes Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), and Waste Treatment (629). |
| Before Practice Situation | Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. |
| After Practice Situation | A steel framed building with steel "sheet" roof and supporting foundation. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 24,000 square feet and is over an approved animal waste management facility as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation". |
| Scenario Feature Measure | Footprint of building |
| Scenario Unit | Square Foot |
| Scenario Typical Size | 24,000 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$152,160.00 | \$6.34 |
| Equipment/Installation | \$0.00 | \$0.00 |
| Labor | \$0.00 | \$0.00 |
| Mobilization | \$518.54 | \$0.02 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$152,678.54 | \$6.36 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|---------------|--------------|---|--|-------------|-----------------|----------|--------------|
| Materials | 1677 | Roof, Steel Frame Monoslope Building, greater than 60' wide | Steel Frame Monoslope Building, greater than 60' width, includes materials, equipment, and installation. Does not include foundation preparation. | Square Foot | \$6.34 | 24000 | \$152,160.00 |
| Mobilization | 1137 | Mobilization, very small equipment | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | \$56.22 | 2 | \$112.44 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 2 | \$406.10 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Environmental Engineering |
| Practice Code/Name | 367 - Roofs and Covers |
| Scenario ID | 4 |
| Scenario Name | Timber or Steel Sheet Roof, >30 Ftwide |
| Scenario Description | A timber framed building with a timber or steel "sheet" roof and supporting foundation. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Associated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Agrichemical Handling Facility (309), Roof Runoff Structure (558), and Waste Treatment (629). |
| Before Practice Situation | Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. |
| After Practice Situation | A timber framed building with a timber or steel "sheet" roof and supporting foundation. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 7,500 square feet and is over an approved animal waste management facility as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation". |
| Scenario Feature Measure | Footprint of building |
| Scenario Unit | Square Foot |
| Scenario Typical Size | 7500 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$54,450.00 | \$7.26 |
| Equipment/Installation | \$0.00 | \$0.00 |
| Labor | \$0.00 | \$0.00 |
| Mobilization | \$315.49 | \$0.04 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$54,765.49 | \$7.30 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|---------------|--------------|--|--|-------------|-----------------|----------|-------------|
| Materials | 1676 | Roof, Post Frame Building, 30' to 60' wide | Post Frame Building, no sides, - 30' to 60' width, includes materials, equipment, and installation. Does not include foundation preparation. | Square Foot | \$7.26 | 7500 | \$54,450.00 |
| Mobilization | 1137 | Mobilization, very small equipment | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | \$56.22 | 2 | \$112.44 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 1 | \$203.05 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | |
| Practice Code/Name | 371 - Air Filtration and Scrubbing |
| Scenario ID | 1 |
| Scenario Name | Biofilter |
| Scenario Description | Establishment of a biofilter used to treat the air flow from a waste pit ventilation fan. Exhaust from a 24" waste pit ventilation fan is piped to a 16' wide by 20' long by 4' high horizontal biofilter constructed of a formed concrete bin that is filled with wood chip media, capable of handling 5,500 cubic feet per minute of airflow. Adequate moisture in the wood chip media is maintained for proper growth of bacteria. Each waste pit ventilation fan servicing a waste storage facility is provided with a separate biofilter. Payment includes materials, equipment, and labor costs for installing the biofilter. A stabilized area around the biofilter is not included and must be addressed through the associated practice of Heavy Use Area Protection (561), if needed. |
| Before Practice Situation | The pit ventilation fans of a manure storage facility on a Headquarters site are exhausting odorous, particulate laden air into the atmosphere. |
| After Practice Situation | Air Quality resource concerns are addressed through installation of the practice by reducing odors and particulate matter emissions. The loading of odor and particulates into the air at the production facility has been significantly reduced, resulting in a substantial improvement in air quality. Ammonia emissions have been reduced approximately 60%; hydrogen sulfide about 80% and odor 60 to 80%. |
| Scenario Feature Measure | Number of Biofilters Installed |
| Scenario Unit | Each |
| Scenario Typical Size | 1 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$3,815.15 | \$3,815.15 |
| Equipment/Installation | \$11,427.51 | \$11,427.51 |
| Labor | \$182.14 | \$182.14 |
| Mobilization | \$355.84 | \$355.84 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$15,780.64 | \$15,780.64 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|--|---|-------------|-----------------|----------|------------|
| Equipment/Installation | 37 | Concrete, CIP, slab on grade, reinforced | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic yard | \$255.77 | 11 | \$2,813.47 |
| Equipment/Installation | 38 | Concrete, CIP, formed reinforced | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic yard | \$406.16 | 19.5 | \$7,920.12 |
| Equipment/Installation | 48 | Excavation, Common Earth, side cast, small equipment | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic yard | \$2.12 | 12 | \$25.44 |
| Materials | 46 | Aggregate, Gravel, Graded | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic yard | \$26.70 | 5 | \$133.50 |
| Equipment/Installation | 1098 | Aggregate, Wood Chips | Includes materials, equipment and labor | Cubic yard | \$19.35 | 24 | \$464.40 |
| Materials | 1906 | Articulated block | Articulated precast concrete blocks with a typical thickness of 4.5 inches. Includes materials only. | Square Foot | \$5.25 | 320 | \$1,680.00 |
| Materials | 1209 | Geotextile, non-woven, light weight | Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials only. | Square Yard | \$1.87 | 36 | \$67.32 |
| Materials | 2046 | Pipe, PVC, 24", SCH 40 | Materials: - 24" - PVC - SCH 40 - ASTM D1785 | Foot | \$36.20 | 40 | \$1,448.00 |
| Materials | 1044 | Dimension Lumber, Treated | Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners | Board Foot | \$0.71 | 80 | \$56.80 |
| Materials | 1488 | Micro Irrigation, surface drip tubing or tape | Tubing or Tape is installed above ground for surface drip irrigation, includes installation, and connections to the supply and flushing laterals. Tubing has emitters built in. | Foot | \$0.28 | 100 | \$28.00 |
| Materials | 996 | Pipe, PE, 3/4", DR 9 | Materials: - 3/4" - PE - 160 psi - ASTM D3035 DR 9 | Foot | \$0.39 | 50 | \$19.50 |
| Materials | 1193 | Switches and Controls, programmable controller | Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems | Each | \$149.00 | 1 | \$149.00 |

| | | | | | | | |
|------------------------|------|--|--|------------|----------|------|----------|
| Materials | 1009 | Pump, < 5 HP - Pump and motor, fixed cost portion | Fixed cost portion of the Pump: < 5 HP - Pump and motor. This portion is a base cost for all Pump: < 5 HP and is not dependant on horsepower. The total cost of any Pump: < 5 HP will include this fixed cost plus a variable cost portion. The completed Pum | Each | \$175.60 | 1 | \$175.60 |
| Materials | 1010 | Pump, < 5 HP - Pump and motor, variable cost portion | Variable cost portion of the Pump: < 5 HP - Pump and motor. This portion IS dependent on the total horsepower for the Pump: < 5 HP. The total cost of any Pump: < 5 HP will include this variable cost plus the fixed cost portion. The completed Pump: < 5 HP | Horsepower | \$229.73 | 0.25 | \$57.43 |
| Equipment/Installation | 939 | Truck, Pickup | Equipment and power unit costs. Labor not included. | Hour | \$25.51 | 8 | \$204.08 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 6 | \$119.52 |
| Labor | 230 | Skilled Labor | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | \$31.31 | 2 | \$62.62 |
| Mobilization | 1143 | Mobilization, Light Equipment Operator | Mobilization of light equipment operators: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | \$22.46 | 1 | \$22.46 |
| Mobilization | 1137 | Mobilization, very small equipment | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | \$56.22 | 1 | \$56.22 |
| Mobilization | 1138 | Mobilization, small equipment | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | \$138.58 | 2 | \$277.16 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agricultural Engineering |
| Practice Code/Name | 374 - Farmstead Energy Improvement |
| Scenario ID | 19 |
| Scenario Name | Greenhouse |
| Scenario Description | A mechanical automated system consisting of a drive motor, support cables, controls, and shade material, or thermal blanket which may be woven, knitted, or non-woven strips of aluminum fiber, polyethylene, nylon or other synthetic material. |
| Before Practice Situation | Heating and cooling of an existing greenhouse is inefficient due to excessive heat loss and/or heat gain and the fact that a greater volume of air is being heated or cooled than is necessary. |
| After Practice Situation | The greenhouse is fitted with a mechanical automated controlled energy screen installed truss-to-truss or gutter-to-gutter, with side screens as necessary, reducing heat loss and/or gain in the greenhouse. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612. |
| Scenario Feature Measure | Square Feet of Blanket |
| Scenario Unit | Square Foot |
| Scenario Typical Size | 25000 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$50,000.00 | \$2.00 |
| Equipment/Installation | \$0.00 | \$0.00 |
| Labor | \$500.96 | \$0.02 |
| Mobilization | \$30.48 | \$0.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$50,531.44 | \$2.02 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|---------------|--------------|---|---|-------------|-----------------|----------|-------------|
| Materials | 1148 | Thermal blanket 10,001 - 50,000 square foot | Thermal blanket greenhouse screens: mechanical energy screen system consists of a drive motor, support cables, controls, and shade material, which may be woven, knitted, or non-woven. Size Range is 10,001 to 50,000 square feet. Materials only. | Square Foot | \$2.00 | 25000 | \$50,000.00 |
| Labor | 230 | Skilled Labor | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | \$31.31 | 16 | \$500.96 |
| Mobilization | 1141 | Mobilization, Skilled labor | Mobilization of skilled labor: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | \$30.48 | 1 | \$30.48 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agricultural Engineering |
| Practice Code/Name | 374 - Farmstead Energy Improvement |
| Scenario ID | 18 |
| Scenario Name | Sealant |
| Scenario Description | A typical scenario is sealing the gaps between walls, gables, ceiling, etc. in a poultry house or greenhouse. Sealing is performed by a professional contractor, not merely use of spray foam from a can. The unit basis of payment in this scenario is each house based on 2400 linear feet of gap. |
| Before Practice Situation | An agricultural facility with an inefficient building envelope with gaps between walls, ceiling, etc. for a total of 2400 linear feet. |
| After Practice Situation | A more effective and efficient building envelope can be created through interior sealing of the exterior walls at the footer plate, eaves, ridge cap, and gable ends. The sealant reduces seasonal heat loss and heat gain due to infiltration which reduces the respective need for heating and cooling equipment to operate. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612. |
| Scenario Feature Measure | Each house with estimated 2400 lf of gap |
| Scenario Unit | Foot |
| Scenario Typical Size | 2400 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$7,800.00 | \$3.25 |
| Equipment/Installation | \$0.00 | \$0.00 |
| Labor | \$0.00 | \$0.00 |
| Mobilization | \$0.00 | \$0.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$7,800.00 | \$3.25 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|---------------|--------------|----------------|--|------|-----------------|----------|------------|
| Materials | 1150 | Sealant | Greenhouse and building gap sealant. Performed by a professional contractor spraying the areas with an approved sealant for poultry production facilities. Includes materials, equipment and labor to install. | Foot | \$3.25 | 2400 | \$7,800.00 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agricultural Engineering |
| Practice Code/Name | 374 - Farmstead Energy Improvement |
| Scenario ID | 17 |
| Scenario Name | Wall Insulation |
| Scenario Description | Enclose both sidewalls and endwalls from ceiling to floor in one of two manners: 1) metal exterior, 3.5" fiberglass batts (R-11), vapor barrier, & interior plywood or OSB sheathing, or 2) closed-cell polyurethane foam application (minimum 1" thickness (R-7) of 2.5 lbs/cu.ft. or higher density, (3.0 or higher density preferred) with a form of physical protective barrier on lower 2' (may be 6 lbs/cu.ft. or higher density 1/8" thick foam, or treated lumber). Based on a 40' x 500' poultry house. |
| Before Practice Situation | A poultry house with an inefficient building envelope with limited wall insulation. |
| After Practice Situation | A more effective and efficient building envelope can be created through addition of, or increased, insulation. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612. |
| Scenario Feature Measure | Square Feet of Wall Insulated |
| Scenario Unit | Square Foot |
| Scenario Typical Size | 20000 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$53,000.00 | \$2.65 |
| Equipment/Installation | \$0.00 | \$0.00 |
| Labor | \$0.00 | \$0.00 |
| Mobilization | \$0.00 | \$0.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$53,000.00 | \$2.65 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|---------------|--------------|---|--|-------------|-----------------|----------|-------------|
| Materials | 1198 | Insulation, polyurethane, R-7, with sheathing skirt | "Closed-cell polyurethane foam insulation (minimum 1" thickness (R-7) with a protective sheathing barrier on lower 2 feet of wall height. Includes materials, equipment and labor to install." | Square Foot | \$0.97 | 10000 | \$9,700.00 |
| Materials | 1197 | Insulation, Panel, R-11 with sheathing | "Insulated wall panel typically 3.5" fiberglass batts (R-11), vapor barrier and OSB sheathing, or equal, includes materials, equipment and labor to install." | Square Foot | \$4.33 | 10000 | \$43,300.00 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|----------------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agricultural Engineering |
| Practice Code/Name | 374 - Farmstead Energy Improvement |
| Scenario ID | 1 |
| Scenario Name | Lighting - CFL |
| Scenario Description | To install dimmable CFLs to replace incandescent lamps on a one-for-one basis. Light fixtures do not have to be replaced. A typical poultry house has 48 fixtures. CFL requirements: minimum 8 Watt, 4100 Kelvin, dimmable, grow-out bulb; industrial grade; suitably protected from dirt accumulation. In high humidity environments or areas subject to wash down, gasketed or weatherproof housings are required to prevent corrosion and premature failure. |
| Before Practice Situation | An inefficient lighting system such as one using incandescent lamps has been identified by an on-farm energy audit. |
| After Practice Situation | More efficient lighting is provided by Compact Fluorescent Lamps (CFLs) in order to reduce energy use as evidenced by the energy audit. Associated practices/activities: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612. |
| Scenario Feature Measure | Each lamp replaced |
| Scenario Unit | Each |
| Scenario Typical Size | 1 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|----------------|--------------------|
| Materials | \$15.31 | \$15.31 |
| Equipment/Installation | \$0.00 | \$0.00 |
| Labor | \$3.33 | \$3.33 |
| Mobilization | \$0.00 | \$0.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$18.64 | \$18.64 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|---------------|--------------|-----------------------------|--|------|-----------------|----------|---------|
| Materials | 1166 | Lighting, bulb, CFL, 8 watt | 8 watt compact fluorescent lamp (CFL), typically 4100 Kelvin, dimmable, grow-out bulb, industrial grade, suitably protected from dirt accumulation. Materials only. | Each | \$15.31 | 1 | \$15.31 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 0.167 | \$3.33 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agricultural Engineering |
| Practice Code/Name | 374 - Farmstead Energy Improvement |
| Scenario ID | 2 |
| Scenario Name | Lighting - LED |
| Scenario Description | To install dimmable LEDs to replace incandescent lamps on a one-for-one basis. Light fixtures do not have to be replaced. A typical poultry house has 48 fixtures. LED requirements: minimum 6 Watt, 3700 Kelvin, dimmable, grow-out bulb; industrial grade; suitably protected from dirt accumulation. In high humidity environments or areas subject to wash down, gasketed or weatherproof housings are required to prevent corrosion and premature failure. |
| Before Practice Situation | An inefficient lighting system such as one using incandescent lamps has been identified by an on-farm energy audit. |
| After Practice Situation | More efficient lighting is provided by Light-Emitting Diode (LED) lamps in order to reduce energy use as evidenced by the energy audit. Associated practices/activities: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612. |
| Scenario Feature Measure | Each lamp replaced |
| Scenario Unit | Each |
| Scenario Typical Size | 1 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$18.51 | \$18.51 |
| Equipment/Installation | \$0.00 | \$0.00 |
| Labor | \$3.33 | \$3.33 |
| Mobilization | \$0.00 | \$0.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$21.84 | \$21.84 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|---------------|--------------|-----------------------------|--|------|-----------------|----------|---------|
| Materials | 1167 | Lighting, bulb, LED, 6 watt | 6 watt light emitting diode (LED), typically 3700 Kelvin, dimmable, grow-out bulb; industrial grade; suitably protected from dirt accumulation. Materials only. | Each | \$18.51 | 1 | \$18.51 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 0.167 | \$3.33 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agricultural Engineering |
| Practice Code/Name | 374 - Farmstead Energy Improvement |
| Scenario ID | 3 |
| Scenario Name | Lighting - Linear Fluorescent |
| Scenario Description | The lighting system consists of a four-foot, three-lamp fixture with a single electronic ballast. The high-efficiency lighting system uses high-efficiency T8 fluorescent lamps. Associated materials for installation of replacement fixtures are included. Appropriate disposal of existing lamps, ballasts and other materials is required. |
| Before Practice Situation | Inefficient lighting (such as incandescent or T12 fluorescent tubes driven by magnetic ballasts) as evidenced by an on-farm energy audit. |
| After Practice Situation | High-efficiency lighting system which reduces energy use. The new lighting equipment will provide suitable light levels and reduce overall power requirements (kW) compared to the existing lighting system as evidenced by the energy audit. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612. |
| Scenario Feature Measure | Each fixture replaced |
| Scenario Unit | Each |
| Scenario Typical Size | 1 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|-----------------|--------------------|
| Materials | \$372.35 | \$372.35 |
| Equipment/Installation | \$0.00 | \$0.00 |
| Labor | \$31.31 | \$31.31 |
| Mobilization | \$30.48 | \$30.48 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$434.14 | \$434.14 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|---------------|--------------|---|---|------|-----------------|----------|----------|
| Materials | 1168 | Lighting, fixture, Fluorescent, 75 watt | 75 watt fluorescent lamp fixture with T5 or T8 lamps and ballast. Materials only. | Each | \$372.35 | 1 | \$372.35 |
| Labor | 230 | Skilled Labor | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | \$31.31 | 1 | \$31.31 |
| Mobilization | 1141 | Mobilization, Skilled labor | Mobilization of skilled labor: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | \$30.48 | 1 | \$30.48 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agricultural Engineering |
| Practice Code/Name | 374 - Farmstead Energy Improvement |
| Scenario ID | 4 |
| Scenario Name | Ventilation - Exhaust |
| Scenario Description | Replacement of a conventional exhaust fan with high volume, low speed, efficient exhaust fan. Fans being installed should be models previously tested by BESS Lab or the Air Movement and Control Association and be in top 20 percentile of fans tested. Practice certification will be through receipts and pictures from the applicant. Typical scenario includes the replacement of a 48" fan. |
| Before Practice Situation | Inefficient ventilation in an agricultural building. |
| After Practice Situation | High-efficiency ventilation system which reduces energy use. The new ventilation equipment will provide suitable air quality and reduce overall power requirements (kW) compared to the existing ventilation system as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612. |
| Scenario Feature Measure | Each |
| Scenario Unit | Each |
| Scenario Typical Size | 1 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|-------------------|--------------------|
| Materials | \$1,268.57 | \$1,268.57 |
| Equipment/Installation | \$0.00 | \$0.00 |
| Labor | \$93.93 | \$93.93 |
| Mobilization | \$30.48 | \$30.48 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$1,392.98 | \$1,392.98 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|---------------|--------------|--------------------------------------|---|------|-----------------|----------|------------|
| Materials | 1187 | "Fan, exhaust, 48"" High Efficiency" | 48 inch high efficiency exhaust fan, controls, wiring, and associated appurtenances. Materials only. | Each | \$1,268.57 | 1 | \$1,268.57 |
| Labor | 230 | Skilled Labor | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | \$31.31 | 3 | \$93.93 |
| Mobilization | 1141 | Mobilization, Skilled labor | Mobilization of skilled labor: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | \$30.48 | 1 | \$30.48 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agricultural Engineering |
| Practice Code/Name | 374 - Farmstead Energy Improvement |
| Scenario ID | 5 |
| Scenario Name | Ventilation - Horizontal Air Flow |
| Scenario Description | A system of fans are installed to create a horizontal air circulation pattern; the new system promotes efficient heat and moisture distribution. In a typical 10,000 square foot greenhouse, 10 HAF fans are needed. Fan performance meets Energy Audit efficiency criteria as tested by AMCA or BESS Labs. |
| Before Practice Situation | Inefficient air circulation system in a greenhouse. |
| After Practice Situation | High-efficiency air circulation system which reduces energy use. The new equipment will provide suitable air quality and reduce overall power requirements (kW) compared to the existing system as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612. |
| Scenario Feature Measure | Each |
| Scenario Unit | Each |
| Scenario Typical Size | 1 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$195.45 | \$195.45 |
| Equipment/Installation | \$0.00 | \$0.00 |
| Labor | \$62.62 | \$62.62 |
| Mobilization | \$30.48 | \$30.48 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$288.55 | \$288.55 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|---------------|--------------|-----------------------------|---|------|-----------------|----------|----------|
| Materials | 1189 | Fan, HAF, 1/10 to 1/15 HP | High efficiency Horizontal Air Flow (HAF) fan, controls, wiring, and associated appurtenances. Materials only. | Each | \$195.45 | 1 | \$195.45 |
| Labor | 230 | Skilled Labor | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | \$31.31 | 2 | \$62.62 |
| Mobilization | 1141 | Mobilization, Skilled labor | Mobilization of skilled labor: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | \$30.48 | 1 | \$30.48 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Engineering General |
| Practice Code/Name | 378 - Pond |
| Scenario ID | 2 |
| Scenario Name | Embankment, 4-6 Pipe |
| Scenario Description | A low-hazard water impoundment structure on agricultural land to improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard irrigation, and other related uses. An earthen embankment will be constructed with a principle spillway conduit and earthen auxiliary spillway, as designed. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. |
| Before Practice Situation | Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or irrigation. Failure of the embankment will not result in loss of life or damages of any kind. |
| After Practice Situation | The typical low hazard pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 5000 cubic yards to create an embankment. The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The principle spillway is installed using an approved conduit material. The earthen auxiliary spillway will be constructed as designed. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396. |
| Scenario Feature Measure | Embankment Volume |
| Scenario Unit | Cubic Yard |
| Scenario Typical Size | 5000 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$523.00 | \$0.10 |
| Equipment/Installation | \$13,738.64 | \$2.75 |
| Labor | \$2,503.14 | \$0.50 |
| Mobilization | \$609.15 | \$0.12 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$17,373.93 | \$3.47 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|--------------------------------|--|------------|-----------------|----------|-------------|
| Materials | 980 | Pipe, PVC, 6", SCH 40 | Materials: - 6" - PVC - SCH 40 - ASTM D1785 | Foot | \$5.23 | 100 | \$523.00 |
| Equipment/Installation | 1206 | Scraper, pull, 7 CY | Pull type earthmoving scraper with 7 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 160 HP typically required for single scraper. | Hour | \$14.39 | 78 | \$1,122.42 |
| Equipment/Installation | 50 | Earthfill, Manually Compacted | Earthfill, manually compacted, includes equipment and labor | Cubic yard | \$5.23 | 20 | \$104.60 |
| Equipment/Installation | 927 | Dozer, 140 HP | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hour | \$98.82 | 8 | \$790.56 |
| Equipment/Installation | 928 | Dozer, 200 HP | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hour | \$150.27 | 78 | \$11,721.06 |
| Labor | 233 | Equipment Operators, Heavy | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.79 | 86 | \$2,303.94 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 10 | \$199.20 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 3 | \$609.15 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Engineering General |
| Practice Code/Name | 378 - Pond |
| Scenario ID | 1 |
| Scenario Name | Embankment, Tile Conduit |
| Scenario Description | A low-hazard water impoundment structure on agricultural land to improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard irrigation, and other related uses. An earthen embankment will be constructed with a principle spillway conduit and earthen auxiliary spillway, as designed. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. |
| Before Practice Situation | Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or irrigation. Failure of the embankment will not result in loss of life or damages of any kind. |
| After Practice Situation | The typical low hazard pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 3100 cubic yards to create an embankment. The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The principle spillway is 6" corrugated plastic tubing. The earthen auxiliary spillway will be constructed as designed. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396. |
| Scenario Feature Measure | Embankment Volume |
| Scenario Unit | Cubic Yard |
| Scenario Typical Size | 3100 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|-------------------|--------------------|
| Materials | \$191.00 | \$0.06 |
| Equipment/Installation | \$6,000.52 | \$1.94 |
| Labor | \$1,766.76 | \$0.57 |
| Mobilization | \$406.10 | \$0.13 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$8,364.38 | \$2.70 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|----------------------------------|--|------------|-----------------|----------|------------|
| Materials | 1242 | Pipe, HDPE, 6", CPT, Single Wall | Pipe, Corrugated Plastic Tubing, Single Wall, 6" diameter - ASTM F405. Material cost only. | Foot | \$1.08 | 80 | \$86.40 |
| Materials | 980 | Pipe, PVC, 6", SCH 40 | Materials: - 6" - PVC - SCH 40 - ASTM D1785 | Foot | \$5.23 | 20 | \$104.60 |
| Equipment/Installation | 50 | Earthfill, Manually Compacted | Earthfill, manually compacted, includes equipment and labor | Cubic yard | \$5.23 | 20 | \$104.60 |
| Equipment/Installation | 931 | Hydraulic Excavator, 1 CY | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hour | \$90.50 | 4 | \$362.00 |
| Equipment/Installation | 927 | Dozer, 140 HP | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hour | \$98.82 | 56 | \$5,533.92 |
| Labor | 233 | Equipment Operators, Heavy | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.79 | 60 | \$1,607.40 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 8 | \$159.36 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 2 | \$406.10 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Engineering General |
| Practice Code/Name | 378 - Pond |
| Scenario ID | 4 |
| Scenario Name | Embankment, >12 Pipe |
| Scenario Description | A low-hazard water impoundment structure on agricultural land to improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard irrigation, and other related uses. An earthen embankment will be constructed with a principle spillway conduit and earthen auxiliary spillway, as designed. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. |
| Before Practice Situation | Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or irrigation. Failure of the embankment will not result in loss of life or damages of any kind. |
| After Practice Situation | The typical low hazard pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 11,000 cubic yards to create an embankment. The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The principle spillway is installed using an approved conduit material. The earthen auxiliary spillway will be constructed as designed. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396. |
| Scenario Feature Measure | Embankment Volume |
| Scenario Unit | Cubic Yard |
| Scenario Typical Size | 11000 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$5,194.40 | \$0.47 |
| Equipment/Installation | \$31,239.55 | \$2.84 |
| Labor | \$6,169.92 | \$0.56 |
| Mobilization | \$868.42 | \$0.08 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$43,472.29 | \$3.95 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|------------------------------------|--|------------|-----------------|----------|-------------|
| Materials | 45 | Aggregate, Sand, Graded, Washed | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic yard | \$25.70 | 16 | \$411.20 |
| Materials | 1358 | Pipe, Steel, 18", Std Wt, USED | Materials: - USED - 18" - Steel Std Wt | Foot | \$39.86 | 120 | \$4,783.20 |
| Equipment/Installation | 1206 | Scraper, pull, 7 CY | Pull type earthmoving scraper with 7 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 160 HP typically required for single scraper. | Hour | \$14.39 | 170 | \$2,446.30 |
| Equipment/Installation | 50 | Earthfill, Manually Compacted | Earthfill, manually compacted, includes equipment and labor | Cubic yard | \$5.23 | 29 | \$151.67 |
| Equipment/Installation | 931 | Hydraulic Excavator, 1 CY | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hour | \$90.50 | 8 | \$724.00 |
| Equipment/Installation | 927 | Dozer, 140 HP | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hour | \$98.82 | 24 | \$2,371.68 |
| Equipment/Installation | 928 | Dozer, 200 HP | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hour | \$150.27 | 170 | \$25,545.90 |
| Labor | 233 | Equipment Operators, Heavy | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.79 | 208 | \$5,572.32 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 30 | \$597.60 |
| Mobilization | 1137 | Mobilization, very small equipment | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | \$56.22 | 1 | \$56.22 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 4 | \$812.20 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Engineering General |
| Practice Code/Name | 378 - Pond |
| Scenario ID | 3 |
| Scenario Name | Embankment, 8-12 Pipe |
| Scenario Description | A low-hazard water impoundment structure on agricultural land to improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard irrigation, and other related uses. An earthen embankment will be constructed with a principle spillway conduit and earthen auxiliary spillway, as designed. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. |
| Before Practice Situation | Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or irrigation. Failure of the embankment will not result in loss of life or damages of any kind. |
| After Practice Situation | The typical low hazard pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 5000 cubic yards to create an embankment. The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The principle spillway is installed using an approved conduit material. The earthen auxiliary spillway will be constructed as designed. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396. |
| Scenario Feature Measure | Embankment Volume |
| Scenario Unit | Cubic Yard |
| Scenario Typical Size | 8000 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$1,669.00 | \$0.21 |
| Equipment/Installation | \$22,479.35 | \$2.81 |
| Labor | \$4,176.48 | \$0.52 |
| Mobilization | \$868.42 | \$0.11 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$29,193.25 | \$3.65 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|------------------------------------|--|------------|-----------------|----------|-------------|
| Materials | 1351 | Pipe, PVC, 10", SCH 80 | Materials: - 10" - PVC - SCH 80 - ASTM D1785 | Foot | \$16.69 | 100 | \$1,669.00 |
| Equipment/Installation | 1206 | Scraper, pull, 7 CY | Pull type earthmoving scraper with 7 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 160 HP typically required for single scraper. | Hour | \$14.39 | 124 | \$1,784.36 |
| Equipment/Installation | 50 | Earthfill, Manually Compacted | Earthfill, manually compacted, includes equipment and labor | Cubic yard | \$5.23 | 29 | \$151.67 |
| Equipment/Installation | 931 | Hydraulic Excavator, 1 CY | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hour | \$90.50 | 8 | \$724.00 |
| Equipment/Installation | 927 | Dozer, 140 HP | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hour | \$98.82 | 12 | \$1,185.84 |
| Equipment/Installation | 928 | Dozer, 200 HP | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hour | \$150.27 | 124 | \$18,633.48 |
| Labor | 233 | Equipment Operators, Heavy | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.79 | 144 | \$3,857.76 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 16 | \$318.72 |
| Mobilization | 1137 | Mobilization, very small equipment | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | \$56.22 | 1 | \$56.22 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 4 | \$812.20 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Forestry |
| Practice Code/Name | 380 - Windbreak/Shelterbelt Est. |
| Scenario ID | 6 |
| Scenario Name | 1 row windbreak - bare-root shrub seedling planting stock |
| Scenario Description | One row of bare-root shrubs planted for wind protection, odor management, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. This practice is typically applied on cropland at field edges, around homesteads or around confinement facilities. Payment includes materials, labor and equipment needed to machine the stock and foregone income for land removed from crop production where windbreak is installed. Site preparation is not included and must be implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching |
| Before Practice Situation | Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screening or management of snow deposition |
| After Practice Situation | A windbreak of bare-root shrubs is installed by machine planting shrubs 5 ft apart. Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening. |
| Scenario Feature Measure | length of windbreak row(s) |
| Scenario Unit | Feet |
| Scenario Typical Size | 500 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$78.00 | \$0.16 |
| Equipment/Installation | \$49.17 | \$0.10 |
| Labor | \$56.44 | \$0.11 |
| Mobilization | \$0.00 | \$0.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$89.48 | \$0.18 |
| Total | \$273.09 | \$0.55 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|--|------|-----------------|----------|---------|
| Materials | 1586 | Wire flags | Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows | Each | \$0.08 | 100 | \$8.00 |
| Materials | 1506 | Shrub, seedling or transplant, bare root, 6-18" | Bare root hardwood trees 6-18" tall. Materials only. | Each | \$0.70 | 100 | \$70.00 |
| Equipment/Installation | 1600 | Mechanical tree planter | Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor. | Hour | \$4.38 | 1 | \$4.38 |
| Equipment/Installation | 939 | Truck, Pickup | Equipment and power unit costs. Labor not included. | Hour | \$25.51 | 1 | \$25.51 |
| Equipment/Installation | 963 | Tractor, agricultural, 60 HP | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | \$19.28 | 1 | \$19.28 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 1 | \$19.92 |
| Labor | 234 | Supervisor or Manager | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | \$36.52 | 1 | \$36.52 |
| Foregone Income | 1961 | FI, Soybeans Dryland | Dryland Soybeans is Primary Crop | Acre | \$385.53 | 0.115 | \$44.34 |
| Foregone Income | 1959 | FI, Corn Dryland | Dryland Corn is Primary Crop | Acre | \$392.59 | 0.115 | \$45.15 |

Scenario Worksheet

Practice and Scenario Description:

| Information Type | Data |
|---------------------------|---|
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Forestry |
| Practice Code/Name | 380 - Windbreak/Shelterbelt Est. |
| Scenario ID | 5 |
| Scenario Name | 1 row windbreak - bare-root tree seedling planting stock |
| Scenario Description | One row of bare-root trees planted for wind protection, odor management, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. This practice is typically applied on cropland at field edges, around homesteads or around confinement facilities. Payment includes materials, labor and equipment needed to machine the stock and foregone income for land removed from crop production where windbreak is installed. Site preparation is not included and must be implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching |
| Before Practice Situation | Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screening or management of snow deposition |
| After Practice Situation | A windbreak of bare-root trees is installed by machine planting trees 10 ft apart. Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening. |
| Scenario Feature Measure | length of windbreak row(s) |
| Scenario Unit | Feet |
| Scenario Typical Size | 500 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$44.00 | \$0.09 |
| Equipment/Installation | \$24.59 | \$0.05 |
| Labor | \$28.22 | \$0.06 |
| Mobilization | \$0.00 | \$0.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$89.48 | \$0.18 |
| Total | \$186.29 | \$0.37 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|--|------|-----------------|----------|---------|
| Materials | 1586 | Wire flags | Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows | Each | \$0.08 | 50 | \$4.00 |
| Materials | 1510 | Tree, hardwood, seedling or transplant, bare root, 16-36" | Bare root hardwood trees 18-36" tall. Materials only. | Each | \$0.80 | 50 | \$40.00 |
| Equipment/Installation | 1600 | Mechanical tree planter | Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor. | Hour | \$4.38 | 0.5 | \$2.19 |
| Equipment/Installation | 939 | Truck, Pickup | Equipment and power unit costs. Labor not included. | Hour | \$25.51 | 0.5 | \$12.76 |
| Equipment/Installation | 963 | Tractor, agricultural, 60 HP | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | \$19.28 | 0.5 | \$9.64 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 0.5 | \$9.96 |
| Labor | 234 | Supervisor or Manager | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | \$36.52 | 0.5 | \$18.26 |
| Foregone Income | 1961 | FI, Soybeans Dryland | Dryland Soybeans is Primary Crop | Acre | \$385.53 | 0.115 | \$44.34 |
| Foregone Income | 1959 | FI, Corn Dryland | Dryland Corn is Primary Crop | Acre | \$392.59 | 0.115 | \$45.15 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Forestry |
| Practice Code/Name | 380 - Windbreak/Shelterbelt Est. |
| Scenario ID | 3 |
| Scenario Name | 1 row windbreak - containerized shrub planting stock |
| Scenario Description | One row of containerized shrubs planted for wind protection, odor management, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. This practice is typically applied on cropland at field edges, around homesteads or around confinement facilities. Payment includes materials, labor and equipment needed to hand plant the stock and foregone income for land removed from crop production where windbreak is installed. Site preparation is not included and must be implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching |
| Before Practice Situation | Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screening or management of snow deposition |
| After Practice Situation | A windbreak of containerized shrubs is installed by hand planting shrubs 6 ft apart. Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening. |
| Scenario Feature Measure | length of windbreak row(s) |
| Scenario Unit | Feet |
| Scenario Typical Size | 500 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|-------------------|--------------------|
| Materials | \$1,259.16 | \$2.52 |
| Equipment/Installation | \$47.20 | \$0.09 |
| Labor | \$282.20 | \$0.56 |
| Mobilization | \$0.00 | \$0.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$89.48 | \$0.18 |
| Total | \$1,678.04 | \$3.36 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|--|--|------|-----------------|----------|------------|
| Materials | 1594 | Fertilizer, tree, slow release, premix packet or spike | Slow release fertilizer to gradually apply nutrients over time for tree establishment. 2.0 Oz Packet (Premixed: 16-16-16 or 16-8-8) or Fertilizer Spike | Each | \$0.75 | 84 | \$63.00 |
| Materials | 1586 | Wire flags | Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows | Each | \$0.08 | 84 | \$6.72 |
| Materials | 1527 | Shrub, seedling or transplant, potted or B&B, 2-3 gal. | Potted or balled and burlapped shrub, 2-3 gal. Materials only. | Each | \$14.16 | 84 | \$1,189.44 |
| Equipment/Installation | 1590 | Hand tools, tree planting | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. | Hour | \$9.44 | 5 | \$47.20 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 5 | \$99.60 |
| Labor | 234 | Supervisor or Manager | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | \$36.52 | 5 | \$182.60 |
| Foregone Income | 1961 | FI, Soybeans Dryland | Dryland Soybeans is Primary Crop | Acre | \$385.53 | 0.115 | \$44.34 |
| Foregone Income | 1959 | FI, Corn Dryland | Dryland Corn is Primary Crop | Acre | \$392.59 | 0.115 | \$45.15 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Forestry |
| Practice Code/Name | 380 - Windbreak/Shelterbelt Est. |
| Scenario ID | 2 |
| Scenario Name | 1 row windbreak - containerized tree planting stock |
| Scenario Description | One row of containerized hardwood and/or conifer trees planted for wind protection, odor management, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. This practice is typically applied on cropland at field edges, around homesteads or around confinement facilities. Payment includes materials, labor and equipment needed to hand plant the stock and foregone income for land removed from crop production where windbreak is installed. Site preparation is not included and must be implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching |
| Before Practice Situation | Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screening or management of snow deposition |
| After Practice Situation | A windbreak of containerized trees is installed by hand planting trees 20 ft apart. Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening. |
| Scenario Feature Measure | length of windbreak row(s) |
| Scenario Unit | Feet |
| Scenario Typical Size | 500 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$358.05 | \$0.72 |
| Equipment/Installation | \$14.16 | \$0.03 |
| Labor | \$84.66 | \$0.17 |
| Mobilization | \$0.00 | \$0.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$89.48 | \$0.18 |
| Total | \$546.35 | \$1.09 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|--|------|-----------------|----------|----------|
| Materials | 1594 | Fertilizer, tree, slow release, premix packet or spike | Slow release fertilizer to gradually apply nutrients over time for tree establishment. 2.0 Oz Packet (Premixed: 16-16-16 or 16-8-8) or Fertilizer Spike | Each | \$0.75 | 25 | \$18.75 |
| Materials | 1586 | Wire flags | Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows | Each | \$0.08 | 25 | \$2.00 |
| Materials | 1532 | Tree, hardwood, seedling or transplant, potted or B&B, 2-3 gal. | Potted or balled and burlapped hardwood tree, 2-3 gal. Materials only. | Each | \$13.42 | 13 | \$174.46 |
| Materials | 1537 | Tree, conifer, seedling or transplant, potted or B&B, 2-3 gal. | Potted or balled and burlapped conifer tree, 2-3 gal. Materials only. | Each | \$13.57 | 12 | \$162.84 |
| Equipment/Installation | 1590 | Hand tools, tree planting | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. | Hour | \$9.44 | 1.5 | \$14.16 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 1.5 | \$29.88 |
| Labor | 234 | Supervisor or Manager | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | \$36.52 | 1.5 | \$54.78 |
| Foregone Income | 1961 | FI, Soybeans Dryland | Dryland Soybeans is Primary Crop | Acre | \$385.53 | 0.115 | \$44.34 |
| Foregone Income | 1959 | FI, Corn Dryland | Dryland Corn is Primary Crop | Acre | \$392.59 | 0.115 | \$45.15 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Range/Pasture Grazing |
| Practice Code/Name | 382 - Fence |
| Scenario ID | 1 |
| Scenario Name | Confinement |
| Scenario Description | Installation of fence reduces resource concerns associated with livestock feeding operations and/or wildlife access to prevent conflicts between humans and livestock or wildlife species. |
| Before Practice Situation | Wildlife negatively impacting sensitive areas such as riparian areas, windbreaks and shelterbelts or feed storage. Disease transmission from wildlife poses a significant health risk to domestic animals. |
| After Practice Situation | Installation of fence reduces resource concerns associated with livestock and/or wildlife access and prevents conflicts between humans and threatened, endangered or sensitive species. Fence includes posts, wire, fasteners, gates, etc. Associated Practices: Prescribed Grazing, Pipeline, Water Well, Spring Development, Heavy Use Area, Pumping Plant, Watering Facility, Forage and Biomass Planting, Critical Area Planting, Access Control |
| Scenario Feature Measure | Length of Fence |
| Scenario Unit | Feet |
| Scenario Typical Size | 1320 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$6,283.61 | \$4.76 |
| Equipment/Installation | \$1,687.70 | \$1.28 |
| Labor | \$2,074.50 | \$1.57 |
| Mobilization | \$322.08 | \$0.24 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$10,367.89 | \$7.85 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|--|------|-----------------|----------|------------|
| Mobilization | 1143 | Mobilization, Light Equipment Operator | Mobilization of light equipment operators: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | \$22.46 | 2 | \$44.92 |
| Mobilization | 1138 | Mobilization, small equipment | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | \$138.58 | 2 | \$277.16 |
| Materials | 6 | "Wire, Woven, Wildlife, 96"" | "High Tensile 12.5 gauge, 96"" - 330' roll" | Each | \$437.50 | 4 | \$1,750.00 |
| Materials | 12 | "Post, Wood, CCA treated, 6"" x 8"" | "Wood Post, End 6"" X 8', CCA Treated" | Each | \$20.58 | 8 | \$164.64 |
| Materials | 13 | "Post, Wood, CCA treated, 6"" x 12-14"" | "Wood Post, Line/End 6"" X 12-14', CCA Treated" | Each | \$41.18 | 76 | \$3,129.68 |
| Materials | 17 | Post, Steel T, 1.33 lbs, 10' | Steel Post, Studded 10' - 1.33 lb | Each | \$12.44 | 66 | \$821.04 |
| Materials | 1086 | Gate, Game, 8' High X 16' | 16' Wide Game Gate (8' Tall) | Each | \$418.25 | 1 | \$418.25 |
| Equipment/Installation | 963 | Tractor, agricultural, 60 HP | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | \$19.28 | 40 | \$771.20 |
| Equipment/Installation | 939 | Truck, Pickup | Equipment and power unit costs. Labor not included. | Hour | \$25.51 | 30 | \$765.30 |
| Equipment/Installation | 934 | Auger, Post driver attachment | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hour | \$7.20 | 21 | \$151.20 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 70 | \$1,394.40 |
| Labor | 232 | Equipment Operators, Light | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | \$22.67 | 30 | \$680.10 |

Scenario Worksheet

Practice and Scenario Description:

| Information Type | Data |
|---------------------------|---|
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Range/Pasture Grazing |
| Practice Code/Name | 382 - Fence |
| Scenario ID | 5 |
| Scenario Name | Permanent High Tensile, Minimum 4 Strand, Posts 16 Ft Centers, Double H |
| Scenario Description | Establishment of permanent electric or non-electric high tensile fence for livestock. Fence is designed using minimum of 4 strands with posts on 16 foot centers using double H bracing. |
| Before Practice Situation | This practice will be installed on grazing land. The resource concerns to be addressed by this practice are poor grazing distribution, inadequate water supply, and degraded site conditions leading to poor animal health. |
| After Practice Situation | This scenario consists of installing a permanent high tensile fence with with a minimum of 4 wires with wooden posts on 16' centers, double H brace assemblies and all appurtenances. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated Practices: Prescribed Grazing, Pipeline, Water Well, Spring Development, Heavy Use Area, Pumping Plant, Watering Facility, Forage and Biomass Planting, Critical Area Planting, Access Control |
| Scenario Feature Measure | Length of fence |
| Scenario Unit | Foot |
| Scenario Typical Size | 1320 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$1,757.54 | \$1.33 |
| Equipment/Installation | \$652.30 | \$0.49 |
| Labor | \$498.00 | \$0.38 |
| Mobilization | \$277.16 | \$0.21 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$3,185.00 | \$2.41 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|--|--|------|-----------------|----------|----------|
| Mobilization | 1138 | Mobilization, small equipment | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | \$138.58 | 2 | \$277.16 |
| Materials | 2 | Wire, High Tensile, 12.5 Gauge, 4,000' roll | High Tensile 12.5 gauge, 4,000' roll | Each | \$116.48 | 2 | \$232.96 |
| Materials | 9 | "Post, Wood, CCA treated, 3-4" x 7" | "Wood Post, Line 3-4" X 7", CCA Treated" | Each | \$9.04 | 87 | \$786.48 |
| Materials | 33 | Fence, Wire Assembly, High Tensile, Electric, 2 Strand | Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves | Foot | \$0.07 | 1320 | \$92.40 |
| Materials | 1059 | Gate, Pipe, 16' | 6 rail tube gate, 16 gauge | Each | \$219.68 | 1 | \$219.68 |
| Materials | 11 | "Post, Wood, CCA treated, 5" x 8" | "Wood Post, End 5" X 8", CCA Treated" | Each | \$15.72 | 6 | \$94.32 |
| Materials | 29 | Electric, Energizer, 6 joule | Electric, Energizer, 6 joule for electric fence | Each | \$331.70 | 1 | \$331.70 |
| Equipment/Installation | 963 | Tractor, agricultural, 60 HP | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | \$19.28 | 15 | \$289.20 |
| Equipment/Installation | 939 | Truck, Pickup | Equipment and power unit costs. Labor not included. | Hour | \$25.51 | 10 | \$255.10 |
| Equipment/Installation | 934 | Auger, Post driver attachment | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hour | \$7.20 | 15 | \$108.00 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 25 | \$498.00 |

Scenario Worksheet

Practice and Scenario Description:

| Information Type | Data |
|---------------------------|--|
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Range/Pasture Grazing |
| Practice Code/Name | 382 - Fence |
| Scenario ID | 3 |
| Scenario Name | Permanent High Tensile Electric 2-3 Strand |
| Scenario Description | Scenario is for the installation of a permanent high tensile electric fence of either 2 or 3 strands. Fence will allow for implementation of a grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Constructed using fencing materials rather than a pre-manufactured gate. |
| Before Practice Situation | On grazing lands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, livestock access to water bodies is uncontrolled. Reduced vegetative cover increases opportunity for encroachment of noxious and invasive weeds. |
| After Practice Situation | Installation of fence will allow for implementation of a rotational grazing plan that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. This scenario consists of installing a permanent high tensile electric fence with 2-3 wires with wooden post of 50' centers, battens between the post, single H brace assemblies, energizer, and all apputenances. Associated Practices: Prescribed Grazing, Pipeline, Water Well, Spring Development, Heavy Use Area, Pumping Plant, Watering Facility, Forage and Biomass Planting, Critical Area Planting, Access Control |
| Scenario Feature Measure | Length of Fence |
| Scenario Unit | Feet |
| Scenario Typical Size | 1320 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$1,201.78 | \$0.91 |
| Equipment/Installation | \$311.94 | \$0.24 |
| Labor | \$239.04 | \$0.18 |
| Mobilization | \$277.16 | \$0.21 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$2,029.92 | \$1.54 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|--|--|------|-----------------|----------|----------|
| Mobilization | 1138 | Mobilization, small equipment | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | \$138.58 | 2 | \$277.16 |
| Materials | 2 | Wire, High Tensile, 12.5 Gauge, 4,000' roll | High Tensile 12.5 gauge, 4,000' roll | Each | \$116.48 | 2 | \$232.96 |
| Materials | 9 | "Post, Wood, CCA treated, 3-4" x 7" | "Wood Post, Line 3-4" X 7', CCA Treated" | Each | \$9.04 | 29 | \$262.16 |
| Materials | 33 | Fence, Wire Assembly, High Tensile, Electric, 2 Strand | Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves | Foot | \$0.07 | 1320 | \$92.40 |
| Materials | 1059 | Gate, Pipe, 16' | 6 rail tube gate, 16 gauge | Each | \$219.68 | 1 | \$219.68 |
| Materials | 11 | "Post, Wood, CCA treated, 5" x 8" | "Wood Post, End 5" X 8', CCA Treated" | Each | \$15.72 | 4 | \$62.88 |
| Materials | 29 | Electric, Energizer, 6 joule | Electric, Energizer, 6 joule for electric fence | Each | \$331.70 | 1 | \$331.70 |
| Equipment/Installation | 963 | Tractor, agricultural, 60 HP | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | \$19.28 | 6 | \$115.68 |
| Equipment/Installation | 939 | Truck, Pickup | Equipment and power unit costs. Labor not included. | Hour | \$25.51 | 6 | \$153.06 |
| Equipment/Installation | 934 | Auger, Post driver attachment | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hour | \$7.20 | 6 | \$43.20 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 12 | \$239.04 |

Scenario Worksheet

Practice and Scenario Description:

| Information Type | Data |
|---------------------------|---|
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Range/Pasture Grazing |
| Practice Code/Name | 382 - Fence |
| Scenario ID | 4 |
| Scenario Name | Permanent High Tensile Electric Single Strand |
| Scenario Description | Scenario is for the installation of a permanent high tensile electric single strand fence. Installation of fence will allow for implementation of a grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. |
| Before Practice Situation | On grazing lands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, cattle access to water bodies is uncontrolled. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds. |
| After Practice Situation | Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Fence includes posts, wire, fasteners, gates, fence charger, etc. Fence will be installed with wildlife friendly considerations. Associated Practices: Prescribed Grazing, Pipeline, Water Well, Spring Development, Heavy Use Area, Pumping Plant, Watering Facility, Forage and Biomass Planting, Critical Area Planting, Access Control |
| Scenario Feature Measure | Length of Fence |
| Scenario Unit | Feet |
| Scenario Typical Size | 1320 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$754.42 | \$0.57 |
| Equipment/Installation | \$155.97 | \$0.12 |
| Labor | \$119.52 | \$0.09 |
| Mobilization | \$277.16 | \$0.21 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$1,307.07 | \$0.99 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|--|--|------|-----------------|----------|----------|
| Mobilization | 1138 | Mobilization, small equipment | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | \$138.58 | 2 | \$277.16 |
| Materials | 2 | Wire, High Tensile, 12.5 Gauge, 4,000' roll | High Tensile 12.5 gauge, 4,000' roll | Each | \$116.48 | 1 | \$116.48 |
| Materials | 9 | "Post, Wood, CCA treated, 3-4" x 7" | "Wood Post, Line 3-4" X 7', CCA Treated" | Each | \$9.04 | 24 | \$216.96 |
| Materials | 32 | Fence, Wire Assembly, High Tensile, Electric, 1 Strand | Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves | Foot | \$0.02 | 1320 | \$26.40 |
| Materials | 11 | "Post, Wood, CCA treated, 5" x 8" | "Wood Post, End 5" X 8', CCA Treated" | Each | \$15.72 | 4 | \$62.88 |
| Materials | 29 | Electric, Energizer, 6 joule | Electric, Energizer, 6 joule for electric fence | Each | \$331.70 | 1 | \$331.70 |
| Equipment/Installation | 963 | Tractor, agricultural, 60 HP | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | \$19.28 | 3 | \$57.84 |
| Equipment/Installation | 939 | Truck, Pickup | Equipment and power unit costs. Labor not included. | Hour | \$25.51 | 3 | \$76.53 |
| Equipment/Installation | 934 | Auger, Post driver attachment | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hour | \$7.20 | 3 | \$21.60 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 6 | \$119.52 |

Scenario Worksheet

Practice and Scenario Description:

| Information Type | Data |
|---------------------------|--|
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Range/Pasture Grazing |
| Practice Code/Name | 382 - Fence |
| Scenario ID | 2 |
| Scenario Name | Permanent Barbed Wire Multi Strand |
| Scenario Description | Scenario is for the establishment of permanent multi strand barbed wire fence for livestock. |
| Before Practice Situation | On grazing lands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, cattle access to water bodies is uncontrolled. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds. Fence installation conditions are for difficult sites such as poor access, steep slopes, rocky sites, dense brush, wet conditions etc. |
| After Practice Situation | Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Fence includes posts, wire, fasteners, gates, brace posts, etc... Fence will be installed with wildlife friendly considerations. Associated Practices: Prescribed Grazing, Pipeline, Water Well, Spring Development, Heavy Use Area, Pumping Plant, Watering Facility, Forage and Biomass Planting, Critical Area Planting, Access Control |
| Scenario Feature Measure | Length of Fence |
| Scenario Unit | Feet |
| Scenario Typical Size | 1320 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$1,426.08 | \$1.08 |
| Equipment/Installation | \$623.88 | \$0.47 |
| Labor | \$478.08 | \$0.36 |
| Mobilization | \$277.16 | \$0.21 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$2,805.20 | \$2.13 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|--|------|-----------------|----------|----------|
| Mobilization | 1138 | Mobilization, small equipment | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | \$138.58 | 2 | \$277.16 |
| Materials | 1 | Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll | Galvanized 12.5 gauge, 1,320' roll | Each | \$63.52 | 5 | \$317.60 |
| Materials | 9 | "Post, Wood, CCA treated, 3-4" x 7" | "Wood Post, Line 3-4" X 7', CCA Treated" | Each | \$9.04 | 68 | \$614.72 |
| Materials | 1059 | Gate, Pipe, 16' | 6 rail tube gate, 16 gauge | Each | \$219.68 | 1 | \$219.68 |
| Materials | 11 | "Post, Wood, CCA treated, 5" x 8" | "Wood Post, End 5" X 8', CCA Treated" | Each | \$15.72 | 4 | \$62.88 |
| Materials | 30 | Fence, Wire Assembly, Barbed Wire, 3 Strand | Brace pins, battens, clips, staples | Foot | \$0.16 | 1320 | \$211.20 |
| Equipment/Installation | 963 | Tractor, agricultural, 60 HP | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | \$19.28 | 12 | \$231.36 |
| Equipment/Installation | 939 | Truck, Pickup | Equipment and power unit costs. Labor not included. | Hour | \$25.51 | 12 | \$306.12 |
| Equipment/Installation | 934 | Auger, Post driver attachment | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hour | \$7.20 | 12 | \$86.40 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 24 | \$478.08 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Range/Pasture Grazing |
| Practice Code/Name | 382 - Fence |
| Scenario ID | 7 |
| Scenario Name | Permanent Woven Wire |
| Scenario Description | Establishment of woven wire fence for livestock. |
| Before Practice Situation | This practice will be installed on grazing land. The resource concerns to be addressed by this practice are poor grazing distribution, inadequate water supply, and degraded site conditions leading to poor animal health. |
| After Practice Situation | Typical size for this scenario is 1320 feet. This scenario consists of installing a permanent woven wire fence with wooden posts of 20' centers and single H brace assemblies. Also includes one strand barbed top wire, and all appurtenances. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated Practices: Prescribed Grazing, Pipeline, Water Well, Spring Development, Heavy Use Area, Pumping Plant, Watering Facility, Forage and Biomass Planting, Critical |
| Scenario Feature Measure | Length of Fence |
| Scenario Unit | Foot |
| Scenario Typical Size | 1320 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$1,929.60 | \$1.46 |
| Equipment/Installation | \$521.84 | \$0.40 |
| Labor | \$478.08 | \$0.36 |
| Mobilization | \$277.16 | \$0.21 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$3,206.68 | \$2.43 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|--|------|-----------------|----------|----------|
| Mobilization | 1138 | Mobilization, small equipment | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | \$138.58 | 2 | \$277.16 |
| Materials | 1 | Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll | Galvanized 12.5 gauge, 1,320' roll | Each | \$63.52 | 1 | \$63.52 |
| Materials | 4 | "Wire, Woven, Galvanized, 12.5 Gauge, 48"" | "Galvanized 12.5 gauge, 48"" - 330' roll" | Each | \$201.52 | 4 | \$806.08 |
| Materials | 9 | "Post, Wood, CCA treated, 3-4"" x 7"" | "Wood Post, Line 3-4"" X 7', CCA Treated" | Each | \$9.04 | 65 | \$587.60 |
| Materials | 35 | Fence, Wire Assembly, Woven Wire | Brace pins, twist sticks, staples | Foot | \$0.12 | 1320 | \$158.40 |
| Materials | 1059 | Gate, Pipe, 16' | 6 rail tube gate, 16 gauge | Each | \$219.68 | 1 | \$219.68 |
| Materials | 11 | "Post, Wood, CCA treated, 5"" x 8"" | "Wood Post, End 5"" X 8', CCA Treated" | Each | \$15.72 | 6 | \$94.32 |
| Equipment/Installation | 963 | Tractor, agricultural, 60 HP | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | \$19.28 | 12 | \$231.36 |
| Equipment/Installation | 939 | Truck, Pickup | Equipment and power unit costs. Labor not included. | Hour | \$25.51 | 8 | \$204.08 |
| Equipment/Installation | 934 | Auger, Post driver attachment | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hour | \$7.20 | 12 | \$86.40 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 24 | \$478.08 |

Scenario Worksheet

Practice and Scenario Description:

| Information Type | Data |
|---------------------------|---|
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Range/Pasture Grazing |
| Practice Code/Name | 382 - Fence |
| Scenario ID | 9 |
| Scenario Name | Safety |
| Scenario Description | A barrier (fence) implemented on an NRCS constructed waste storage system according to engineering design to exclude human access. Permanently installed fence built to (1) keep humans away from waste ponds & lagoons, or (2) to protect sensitive areas (riparian areas, wetlands, springs, etc.) from heavy livestock pressure. Heavy grade fence materials and close post spacing required. |
| Before Practice Situation | Where a NRCS designed and constructed waste storage pond is planned whereby significant risk to human safety is determined to be evident. Livestock has access to sensitive areas that may cause detrimental effect to animal/human health and wildlife habitat. Resource concerns affected are plant health and vigor, wildlife habitat, compaction of soils, runoff of sediment or water quality due to turbidity. |
| After Practice Situation | Humans and livestock are excluded from the waste storage pond for safety purposes by installing a fence around a waste holding pond. The fence would typically be 100 wide x 175 long with one gate and installed by a fencing contractor. Woven wire fence with one strand of barb wire on top with a gate. Improved livestock control and access to water or other sensitive areas will promote safety for livestock/humans improve health, vigor of sensitive species, limiting soil erosion, and condition. |
| Scenario Feature Measure | Length of Fence |
| Scenario Unit | Feet |
| Scenario Typical Size | 450 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$1,282.25 | \$2.85 |
| Equipment/Installation | \$259.95 | \$0.58 |
| Labor | \$570.84 | \$1.27 |
| Mobilization | \$277.16 | \$0.62 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$2,390.20 | \$5.31 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|--|------|-----------------|----------|----------|
| Mobilization | 1138 | Mobilization, small equipment | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | \$138.58 | 2 | \$277.16 |
| Materials | 1 | Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll | Galvanized 12.5 gauge, 1,320' roll | Each | \$63.52 | 1 | \$63.52 |
| Materials | 9 | "Post, Wood, CCA treated, 3-4" x 7" | "Wood Post, Line 3-4" X 7", CCA Treated" | Each | \$9.04 | 8 | \$72.32 |
| Materials | 3 | "Wire, Woven, Galvanized, 12.5 Gauge, 32'" | "Galvanized 12.5 gauge, 32'" - 330' roll" | Each | \$166.41 | 2 | \$332.82 |
| Materials | 1059 | Gate, Pipe, 16' | 6 rail tube gate, 16 gauge | Each | \$219.68 | 1 | \$219.68 |
| Materials | 12 | "Post, Wood, CCA treated, 6" x 8" | "Wood Post, End 6" X 8", CCA Treated" | Each | \$20.58 | 13 | \$267.54 |
| Materials | 15 | Post, Steel T, 1.33 lbs, 6' | Steel Post, Studded 6' - 1.33 lb | Each | \$7.59 | 43 | \$326.37 |
| Equipment/Installation | 963 | Tractor, agricultural, 60 HP | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | \$19.28 | 5 | \$96.40 |
| Equipment/Installation | 939 | Truck, Pickup | Equipment and power unit costs. Labor not included. | Hour | \$25.51 | 5 | \$127.55 |
| Equipment/Installation | 934 | Auger, Post driver attachment | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hour | \$7.20 | 5 | \$36.00 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 15 | \$298.80 |
| Labor | 232 | Equipment Operators, Light | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | \$22.67 | 12 | \$272.04 |

Scenario Worksheet

Practice and Scenario Description:

| Information Type | Data |
|---------------------------|--|
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agronomy |
| Practice Code/Name | 386 - Field Border |
| Scenario ID | 1 |
| Scenario Name | Introduced Grass |
| Scenario Description | A strip of permanent vegetation established at the edge or around the perimeter of a field. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of introduced species (scenario includes non-native grass/legume species) and the area of the field border is taken out of production. |
| Before Practice Situation | Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns. |
| After Practice Situation | This practice when applied around a field will support and connect other buffer practices within and between fields. Introduced grasses and legumes will be established around the field edges to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Introduced species of grasses, legumes, forbs or shrubs shall be selected that are adapted to site, will not function as a host for diseases of a field crop and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area. |
| Scenario Feature Measure | Number of acres |
| Scenario Unit | Acre |
| Scenario Typical Size | 1 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$130.42 | \$130.42 |
| Equipment/Installation | \$31.47 | \$31.47 |
| Labor | \$0.00 | \$0.00 |
| Mobilization | \$0.00 | \$0.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$389.06 | \$389.06 |
| Total | \$550.95 | \$550.95 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|--|--|-------|-----------------|----------|----------|
| Materials | 97 | Timothy (Phleum pratense) | Introduced Perennial Grasses and shipping. | Pound | \$2.46 | 2 | \$4.92 |
| Materials | 95 | Smooth Bromegrass (Bromus inermis) | Introduced Perennial Grasses and shipping. | Pound | \$3.15 | 4 | \$12.60 |
| Materials | 92 | Orchard Grass (Dactylis glomerata) | Introduced Perennial Grasses and shipping. | Pound | \$2.04 | 4 | \$8.16 |
| Materials | 74 | Potassium, K2O | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | \$0.52 | 40 | \$20.80 |
| Materials | 73 | Phosphorus, P2O5 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | \$0.65 | 50 | \$32.50 |
| Materials | 71 | Nitrogen (N), Urea | Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed. | Pound | \$0.60 | 50 | \$30.00 |
| Materials | 334 | Herbicide, Glyphosate | A broad-spectrum, non-selective systemic herbicide. Product is typically used in these practices 340, 645, 314, 666, and 512. Refer to WIN-PST for product names and active ingredients. Materials only. | Acre | \$11.04 | 1 | \$11.04 |
| Materials | 112 | Red Clover (Trifolium pratense) | Introduced Legumes and shipping. | Pound | \$2.60 | 4 | \$10.40 |
| Equipment/Installation | 948 | Chemical, ground application | Chemical application performed by ground equipment. Equipment and labor costs included. | Acre | \$6.50 | 1 | \$6.50 |
| Equipment/Installation | 950 | Fertilizer, ground application, dry bulk | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | \$5.89 | 1 | \$5.89 |
| Equipment/Installation | 960 | Seeding Operation, No Till/Grass Drill | No Till drill or grass drill for seeding. Includes all costs for equipment, power unit, and labor. | Acre | \$19.08 | 1 | \$19.08 |
| Foregone Income | 1961 | FI, Soybeans Dryland | Dryland Soybeans is Primary Crop | Acre | \$385.53 | 0.5 | \$192.77 |
| Foregone Income | 1959 | FI, Corn Dryland | Dryland Corn is Primary Crop | Acre | \$392.59 | 0.5 | \$196.30 |

Scenario Worksheet

Practice and Scenario Description:

| Information Type | Data |
|---------------------------|--|
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agronomy |
| Practice Code/Name | 386 - Field Border |
| Scenario ID | 3 |
| Scenario Name | Organic Introduced Grass |
| Scenario Description | A strip of permanent vegetation established at the edge or around the perimeter of a field. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of introduced species (scenario includes non-native grass/legume species) and the area of the field border is taken out of production. |
| Before Practice Situation | Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns. |
| After Practice Situation | This practice when applied around a field will support and connect other buffer practices within and between fields. Introduced grasses and legumes will be established around the field edges to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Introduced species of grasses, legumes, forbs or shrubs shall be selected that are adapted to site, will not function as a host for diseases of a field crop and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area. |
| Scenario Feature Measure | Number of acres |
| Scenario Unit | Acre |
| Scenario Typical Size | 1 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$385.64 | \$385.64 |
| Equipment/Installation | \$44.23 | \$44.23 |
| Labor | \$0.00 | \$0.00 |
| Mobilization | \$0.00 | \$0.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$389.06 | \$389.06 |
| Total | \$818.93 | \$818.93 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|--|-------|-----------------|----------|----------|
| Materials | 266 | Nitrogen, Organic | ORGANIC Nitrogen | Pound | \$2.43 | 50 | \$121.50 |
| Materials | 267 | Phosphorus, Organic | ORGANIC Phosphorus | Pound | \$2.92 | 50 | \$146.00 |
| Materials | 117 | Certified Organic, Red Clover (Trifolium pratense) | Introduced Legumes and shipping. | Pound | \$8.46 | 3 | \$25.38 |
| Materials | 114 | Certified Organic, Alfalfa (Medicago sativa) | Introduced Legumes and shipping. | Pound | \$4.38 | 4 | \$17.52 |
| Materials | 268 | Potassium, Organic | ORGANIC Potassium | Pound | \$1.29 | 40 | \$51.60 |
| Materials | 103 | Certified Organic, Timothy (Phleum pratense) | Introduced Perennial Grasses and shipping. | Pound | \$3.00 | 2 | \$6.00 |
| Materials | 102 | Certified Organic, Smooth Bromegrass (Bromus inermis) | Introduced Perennial Grasses and shipping. | Pound | \$4.41 | 4 | \$17.64 |
| Equipment/Installation | 945 | Tillage, Light | Includes light disking (tandem) or field cultivator. Equipment and power unit costs. Labor is included. | Acre | \$9.63 | 2 | \$19.26 |
| Equipment/Installation | 950 | Fertilizer, ground application, dry bulk | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | \$5.89 | 1 | \$5.89 |
| Equipment/Installation | 960 | Seeding Operation, No Till/Grass Drill | No Till drill or grass drill for seeding. Includes all costs for equipment, power unit, and labor. | Acre | \$19.08 | 1 | \$19.08 |
| Foregone Income | 1961 | FI, Soybeans Dryland | Dryland Soybeans is Primary Crop | Acre | \$385.53 | 0.5 | \$192.77 |
| Foregone Income | 1959 | FI, Corn Dryland | Dryland Corn is Primary Crop | Acre | \$392.59 | 0.5 | \$196.30 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agronomy |
| Practice Code/Name | 386 - Field Border |
| Scenario ID | 2 |
| Scenario Name | Native Grass |
| Scenario Description | A strip of permanent vegetation established at the edge or around the perimeter of a field. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of native species (scenario includes native grass/legume/forbs species) and the area of the field border is taken out of production. |
| Before Practice Situation | Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns. |
| After Practice Situation | This practice when applied around a field will support and connect other buffer practices within and between fields. Native grasses, legumes and forbs will be established around the field edges to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Native species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area. |
| Scenario Feature Measure | number of acres |
| Scenario Unit | Acre |
| Scenario Typical Size | 1 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$174.42 | \$174.42 |
| Equipment/Installation | \$32.08 | \$32.08 |
| Labor | \$0.00 | \$0.00 |
| Mobilization | \$0.00 | \$0.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$389.06 | \$389.06 |
| Total | \$595.56 | \$595.56 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|--|--|-------|-----------------|----------|----------|
| Materials | 84 | Wild Rye, Virginia (Elymus virginicus) | Native Grasses and shipping. | Pound | \$9.81 | 2 | \$19.62 |
| Materials | 79 | Little Blue Stem (Schizachyrium scoparium) | Native Grasses and shipping. | Pound | \$15.43 | 4 | \$61.72 |
| Materials | 334 | Herbicide, Glyphosate | A broad-spectrum, non-selective systemic herbicide. Product is typically used in these practices 340, 645, 314, 666, and 512. Refer to WIN-PST for product names and active ingredients. Materials only. | Acre | \$11.04 | 2 | \$22.08 |
| Materials | 136 | Purple Coneflower (Echinacea purpurea) | Native Forbs and shipping. | Pound | \$32.78 | 0.25 | \$8.20 |
| Materials | 125 | Partidge Pea (Chamaecrista fasciculata) | Native Legumes and shipping. | Pound | \$15.70 | 4 | \$62.80 |
| Equipment/Installation | 948 | Chemical, ground application | Chemical application performed by ground equipment. Equipment and labor costs included. | Acre | \$6.50 | 2 | \$13.00 |
| Equipment/Installation | 960 | Seeding Operation, No Till/Grass Drill | No Till drill or grass drill for seeding. Includes all costs for equipment, power unit, and labor. | Acre | \$19.08 | 1 | \$19.08 |
| Foregone Income | 1961 | FI, Soybeans Dryland | Dryland Soybeans is Primary Crop | Acre | \$385.53 | 0.5 | \$192.77 |
| Foregone Income | 1959 | FI, Corn Dryland | Dryland Corn is Primary Crop | Acre | \$392.59 | 0.5 | \$196.30 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agronomy |
| Practice Code/Name | 386 - Field Border |
| Scenario ID | 4 |
| Scenario Name | Organic Native Grass |
| Scenario Description | A strip of permanent vegetation established at the edge or around the perimeter of a field. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of native species (scenario includes native grass/legume/forbs species) and the area of the field border is taken out of production. |
| Before Practice Situation | Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns. |
| After Practice Situation | This practice when applied around a field will support and connect other buffer practices within and between fields. Native grasses, legumes and forbs will be established around the field edges to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Native species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area. |
| Scenario Feature Measure | number of acres |
| Scenario Unit | Acre |
| Scenario Typical Size | 1 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$152.34 | \$152.34 |
| Equipment/Installation | \$47.97 | \$47.97 |
| Labor | \$0.00 | \$0.00 |
| Mobilization | \$0.00 | \$0.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$389.06 | \$389.06 |
| Total | \$589.37 | \$589.37 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|--|---|-------|-----------------|----------|----------|
| Materials | 84 | Wild Rye, Virginia (Elymus virginicus) | Native Grasses and shipping. | Pound | \$9.81 | 2 | \$19.62 |
| Materials | 79 | Little Blue Stem (Schizachyrium scoparium) | Native Grasses and shipping. | Pound | \$15.43 | 4 | \$61.72 |
| Materials | 136 | Purple Coneflower (Echinacea purpurea) | Native Forbs and shipping. | Pound | \$32.78 | 0.25 | \$8.20 |
| Materials | 125 | Partidge Pea (Chamaecrista fasciculata) | Native Legumes and shipping. | Pound | \$15.70 | 4 | \$62.80 |
| Equipment/Installation | 945 | Tillage, Light | Includes light disking (tandem) or field cultivator. Equipment and power unit costs. Labor is included. | Acre | \$9.63 | 3 | \$28.89 |
| Equipment/Installation | 960 | Seeding Operation, No Till/Grass Drill | No Till drill or grass drill for seeding. Includes all costs for equipment, power unit, and labor. | Acre | \$19.08 | 1 | \$19.08 |
| Foregone Income | 1961 | FI, Soybeans Dryland | Dryland Soybeans is Primary Crop | Acre | \$385.53 | 0.5 | \$192.77 |
| Foregone Income | 1959 | FI, Corn Dryland | Dryland Corn is Primary Crop | Acre | \$392.59 | 0.5 | \$196.30 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|----------------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agronomy |
| Practice Code/Name | 386 - Field Border |
| Scenario ID | 5 |
| Scenario Name | Pollinator Habitat |
| Scenario Description | A strip of permanent vegetation established at the edge or around the perimeter of a field including mix of grasses, legumes and/or forbs that provides a mix of early, mid, and late season blooming forbs for pollinator habitat. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of pollinator friendly herbaceous species. The area of the field border is taken out of production. |
| Before Practice Situation | Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns. |
| After Practice Situation | This practice when applied around a field will support and connect other buffer practices within and between fields. Pollinator herbaceous plantings will provide species which flower throughout the growing season. This provides a source of nectar for adult pollinators and a diversity of herbaceous material for immature pollinator life stages and for nesting. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall meet the pollinator habitat requirements of the state and be adapted to site; not function as a host for diseases of a field crop and; have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area. |
| Scenario Feature Measure | Number of acres |
| Scenario Unit | Acre |
| Scenario Typical Size | 1 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|-----------------|--------------------|
| Materials | \$216.78 | \$216.78 |
| Equipment/Installation | \$38.58 | \$38.58 |
| Labor | \$0.00 | \$0.00 |
| Mobilization | \$0.00 | \$0.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$389.06 | \$389.06 |
| Total | \$644.42 | \$644.42 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|---------------|--------------|--|--|-------|-----------------|----------|---------|
| Materials | 119 | Blue Wild Indigo (Baptisia australis) | Native Legumes and shipping. | Pound | \$156.45 | 0.5 | \$78.23 |
| Materials | 79 | Little Blue Stem (Schizachyrium scoparium) | Native Grasses and shipping. | Pound | \$15.43 | 1 | \$15.43 |
| Materials | 84 | Wild Rye, Virginia (Elymus virginicus) | Native Grasses and shipping. | Pound | \$9.81 | 1 | \$9.81 |
| Materials | 125 | Partidge Pea (Chamaecrista fasciculata) | Native Legumes and shipping. | Pound | \$15.70 | 0.5 | \$7.85 |
| Materials | 334 | Herbicide, Glyphosate | A broad-spectrum, non-selective systemic herbicide. Product is typically used in these practices 340, 645, 314, 666, and 512. Refer to WIN-PST for product names and active ingredients. Materials only. | Acre | \$11.04 | 3 | \$33.12 |
| Materials | 129 | Wild Senna (Cassia hebecarpa) | Native Legumes and shipping. | Pound | \$68.25 | 0.5 | \$34.13 |
| Materials | 136 | Purple Coneflower (Echinacea purpurea) | Native Forbs and shipping. | Pound | \$32.78 | 0.2 | \$6.56 |
| Materials | 133 | Smooth Aster (Aster laevis) | Native Forbs and shipping. | Pound | \$217.74 | 0.126 | \$27.44 |
| Materials | 148 | Black-Eyed Susan (Rudbeckia hirta) | Native Forbs and shipping. | Pound | \$33.55 | 0.126 | \$4.23 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|----------------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agronomy |
| Practice Code/Name | 386 - Field Border |
| Scenario ID | 6 |
| Scenario Name | Organic Pollinator Habitat |
| Scenario Description | A strip of permanent vegetation established at the edge or around the perimeter of a field including mix of grasses, legumes and/or forbs that provides a mix of early, mid, and late season blooming forbs for pollinator habitat. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of pollinator friendly herbaceous species. The area of the field border is taken out of production. |
| Before Practice Situation | Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns. |
| After Practice Situation | This practice when applied around a field will support and connect other buffer practices within and between fields. Pollinator herbaceous plantings will provide species which flower throughout the growing season. This provides a source of nectar for adult pollinators and a diversity of herbaceous material for immature pollinator life stages and for nesting. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall meet the pollinator habitat requirements of the state and be adapted to site; not function as a host for diseases of a field crop and; have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area. |
| Scenario Feature Measure | Number of acres |
| Scenario Unit | Acre |
| Scenario Typical Size | 1 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|-----------------|--------------------|
| Materials | \$183.66 | \$183.66 |
| Equipment/Installation | \$47.97 | \$47.97 |
| Labor | \$0.00 | \$0.00 |
| Mobilization | \$0.00 | \$0.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$389.06 | \$389.06 |
| Total | \$620.69 | \$620.69 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|---------------|--------------|--|------------------------------|-------|-----------------|----------|---------|
| Materials | 119 | Blue Wild Indigo (Baptisia australis) | Native Legumes and shipping. | Pound | \$156.45 | 0.5 | \$78.23 |
| Materials | 79 | Little Blue Stem (Schizachyrium scoparium) | Native Grasses and shipping. | Pound | \$15.43 | 1 | \$15.43 |
| Materials | 84 | Wild Rye, Virginia (Elymus virginicus) | Native Grasses and shipping. | Pound | \$9.81 | 1 | \$9.81 |
| Materials | 125 | Partidge Pea (Chamaecrista fasciculata) | Native Legumes and shipping. | Pound | \$15.70 | 0.5 | \$7.85 |
| Materials | 129 | Wild Senna (Cassia hebecarpa) | Native Legumes and shipping. | Pound | \$68.25 | 0.5 | \$34.13 |
| Materials | 136 | Purple Coneflower (Echinacea purpurea) | Native Forbs and shipping. | Pound | \$32.78 | 0.2 | \$6.56 |
| Materials | 133 | Smooth Aster (Aster laevis) | Native Forbs and shipping. | Pound | \$217.74 | 0.126 | \$27.44 |
| Materials | 148 | Black-Eyed Susan (Rudbeckia hirta) | Native Forbs and shipping. | Pound | \$33.55 | 0.126 | \$4.23 |

Scenario Worksheet

Practice and Scenario Description:

| Information Type | Data |
|---------------------------|--|
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Wildlife Wetland |
| Practice Code/Name | 390 - Riparian Herbaceous Cover |
| Scenario ID | 3 |
| Scenario Name | Native Grass |
| Scenario Description | This scenario addresses inadequate herbaceous plant community function or diversity within the specific transitional zone between terrestrial and aquatic habitats in rangeland, pasture, cropland, and forest where natural seeding methods and/or management is unlikely to improve the plant community within a reasonable time period. This scenario applies to work not covered under NRCS Conservation Practice Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection (580), Vegetated Treatment Area (635), Wetland Enhancement (659), or Wetland Restoration (657). The typical setting for this scenario is usually a narrow strip between the aquatic and terrestrial habitats subject to intermittent flooding and saturated soils where the existing plant community has been disturbed, destroyed, or the species diversity is unable to provide proper function and/or adequate habitat. Native Grass is established by seeding. Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Payment includes seedbed preparation, seed, and planting, and foregone income for land removed from production. |
| Before Practice Situation | The riparian zone, the specific area between terrestrial and aquatic habitats, is currently an undesirable or inadequate stand of perennial or annual vegetation and natural reseeding or vegetation management is unlikely to improve the plant community within a reasonable amount of time to adequately address streambank and/or shoreline stability, dissipate stream energy and trap sediment, improve and/or maintain water quality, and/or provide adequate habitat corridors, food and/or cover for fish, wildlife, pollinators, and/or livestock resource concern(s). Existing conditions often require suppression or eradication of current vegetation by conventional mechanical or chemical (Herbaceous Weed Control (315)) methods to ensure establishment success of the new planting. |
| After Practice Situation | The riparian zone, the transitional zone between the terrestrial and aquatic habitats, is established to an adapted, diverse vegetative plant community and is under close management to insure long term survival and ecological succession. The quality and quantity of the riparian zone components are managed to support the species that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream. |
| Scenario Feature Measure | Acres of Riparian Herbaceous Cover |
| Scenario Unit | Acre |
| Scenario Typical Size | 1 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$59.18 | \$59.18 |
| Equipment/Installation | \$28.71 | \$28.71 |
| Labor | \$0.00 | \$0.00 |
| Mobilization | \$277.16 | \$277.16 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$389.06 | \$389.06 |
| Total | \$754.11 | \$754.11 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|--|--|-------|-----------------|----------|----------|
| Materials | 122 | Illinois Bundleflower (Desmanthus illinoensis) | Native Legumes and shipping. | Pound | \$27.94 | 1 | \$27.94 |
| Materials | 76 | Big Blue Stem (Andropogon gerardii) | Native Grasses and shipping. | Pound | \$11.81 | 1 | \$11.81 |
| Materials | 82 | Switchgrass, Blackwell (Panicum virgatum) | Native Grasses and shipping. | Pound | \$9.62 | 1 | \$9.62 |
| Materials | 84 | Wild Rye, Virginia (Elymus virginicus) | Native Grasses and shipping. | Pound | \$9.81 | 1 | \$9.81 |
| Equipment/Installation | 960 | Seeding Operation, No Till/Grass Drill | No Till drill or grass drill for seeding. Includes all costs for equipment, power unit, and labor. | Acre | \$19.08 | 1 | \$19.08 |
| Equipment/Installation | 945 | Tillage, Light | Includes light disking (tandem) or field cultivator. Equipment and power unit costs. Labor is included. | Acre | \$9.63 | 1 | \$9.63 |
| Mobilization | 1138 | Mobilization, small equipment | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | \$138.58 | 2 | \$277.16 |
| Foregone Income | 1959 | FI, Corn Dryland | Dryland Corn is Primary Crop | Acre | \$392.59 | 0.5 | \$196.30 |
| Foregone Income | 1961 | FI, Soybeans Dryland | Dryland Soybeans is Primary Crop | Acre | \$385.53 | 0.5 | \$192.77 |

Scenario Worksheet

Practice and Scenario Description:

| Information Type | Data |
|---------------------------|--|
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Wildlife Wetland |
| Practice Code/Name | 390 - Riparian Herbaceous Cover |
| Scenario ID | 4 |
| Scenario Name | Pollinator |
| Scenario Description | This scenario addresses inadequate herbaceous plant community function or diversity within the specific transitional zone between terrestrial and aquatic habitats in rangeland, pasture, cropland, and forest where natural seeding methods and/or management is unlikely to improve the plant community within a reasonable time period. This scenario applies to work not covered under NRCS Conservation Practice Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection (580), Vegetated Treatment Area (635), Wetland Enhancement (659), or Wetland Restoration (657). The typical setting for this scenario is usually a narrow strip between the aquatic and terrestrial habitats subject to intermittent flooding and saturated soils where the existing plant community has been disturbed, destroyed, or the species diversity is unable to provide proper function and/or adequate habitat. Pollinator habitat is established by seeding. Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Payment includes seedbed preparation, seed, and planting, and foregone income for land removed from production. |
| Before Practice Situation | The riparian zone, the specific area between terrestrial and aquatic habitats, is currently an undesirable or inadequate stand of perennial or annual vegetation and natural reseeding or vegetation management is unlikely to improve the plant community within a reasonable amount of time to adequately address streambank and/or shoreline stability, dissipate stream energy and trap sediment, improve and/or maintain water quality, and/or provide adequate habitat corridors, food and/or cover for fish, wildlife, pollinators, and/or livestock resource concern(s). Existing conditions often require suppression or eradication of current vegetation by conventional mechanical or chemical (Herbaceous Weed Control (315)) methods to ensure establishment success of the new planting. Soil quality may be reduced due to compaction and may require light tillage to prepare a proper seedbed. |
| After Practice Situation | The riparian zone, the transitional zone between the terrestrial and aquatic habitats, is established to an adapted, diverse vegetative plant community and is under close management to insure long term survival and ecological succession. The quality and quantity of the riparian zone components are managed to support the species that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream. |
| Scenario Feature Measure | Acres of Riparian Herbaceous Cover |
| Scenario Unit | Acre |
| Scenario Typical Size | 1 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$669.04 | \$669.04 |
| Equipment/Installation | \$28.71 | \$28.71 |
| Labor | \$0.00 | \$0.00 |
| Mobilization | \$277.16 | \$277.16 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$389.06 | \$389.06 |
| Total | \$1,363.97 | \$1,363.97 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|--|--|-------|-----------------|----------|----------|
| Materials | 122 | Illinois Bundleflower (Desmanthus illinoensis) | Native Legumes and shipping. | Pound | \$27.94 | 1 | \$27.94 |
| Materials | 76 | Big Blue Stem (Andropogon gerardii) | Native Grasses and shipping. | Pound | \$11.81 | 2 | \$23.62 |
| Materials | 131 | Swamp Milkweed (Asclepias incarnata) | Native Forbs and shipping. | Pound | \$235.45 | 0.5 | \$117.73 |
| Materials | 135 | Nodding Sticktight (Bidens cernua) | Native Forbs and shipping. | Pound | \$205.45 | 0.5 | \$102.73 |
| Materials | 139 | Western Sunflower (Helianthus occidentalis) | Native Forbs and shipping. | Pound | \$467.12 | 0.5 | \$233.56 |
| Materials | 155 | Western Ironweed (Vernonia fasciculata) | Native Forbs and shipping. | Pound | \$170.45 | 0.5 | \$85.23 |
| Materials | 154 | Blue Vervain (Verbena hastata) | Native Forbs and shipping. | Pound | \$78.24 | 1 | \$78.24 |
| Equipment/Installation | 960 | Seeding Operation, No Till/Grass Drill | No Till drill or grass drill for seeding. Includes all costs for equipment, power unit, and labor. | Acre | \$19.08 | 1 | \$19.08 |
| Equipment/Installation | 945 | Tillage, Light | Includes light disking (tandem) or field cultivator. Equipment and power unit costs. Labor is included. | Acre | \$9.63 | 1 | \$9.63 |
| Mobilization | 1138 | Mobilization, small equipment | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | \$138.58 | 2 | \$277.16 |
| Foregone Income | 1959 | FI, Corn Dryland | Dryland Corn is Primary Crop | Acre | \$392.59 | 0.5 | \$196.30 |
| Foregone Income | 1961 | FI, Soybeans Dryland | Dryland Soybeans is Primary Crop | Acre | \$385.53 | 0.5 | \$192.77 |

Scenario Worksheet

Practice and Scenario Description:

| Information Type | Data |
|---------------------------|---|
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Forestry |
| Practice Code/Name | 391 - Riparian Forest Buffer |
| Scenario ID | 2 |
| Scenario Name | Bare-root, trees and shrubs |
| Scenario Description | Establish a buffer of trees and shrubs into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body and extend the minimum required width. The planting will consist of machine planted bare-root shrubs and trees at spacings recommended in a tree/shrub planting plan. Payment includes trees, equipment and labor to plant, and foregone income for the land taken out of crop production to install the riparian buffer. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching |
| Before Practice Situation | Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife. |
| After Practice Situation | A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the resource concerns of Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation. |
| Scenario Feature Measure | Area of planting |
| Scenario Unit | Acre |
| Scenario Typical Size | 5 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$2,423.70 | \$484.74 |
| Equipment/Installation | \$98.34 | \$19.67 |
| Labor | \$158.22 | \$31.64 |
| Mobilization | \$389.32 | \$77.86 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$1,945.30 | \$389.06 |
| Total | \$5,014.88 | \$1,002.98 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|--|------|-----------------|----------|------------|
| Materials | 1510 | Tree, hardwood, seedling or transplant, bare root, 16-36" | Bare root hardwood trees 18-36" tall. Materials only. | Each | \$0.80 | 1744 | \$1,395.20 |
| Materials | 1507 | Shrub, seedling or transplant, bare root, 18"-36" | Bare root hardwood trees 18-36" tall. Materials only. | Each | \$0.85 | 1210 | \$1,028.50 |
| Equipment/Installation | 1600 | Mechanical tree planter | Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor. | Hour | \$4.38 | 2 | \$8.76 |
| Equipment/Installation | 939 | Truck, Pickup | Equipment and power unit costs. Labor not included. | Hour | \$25.51 | 2 | \$51.02 |
| Equipment/Installation | 963 | Tractor, agricultural, 60 HP | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | \$19.28 | 2 | \$38.56 |
| Labor | 234 | Supervisor or Manager | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | \$36.52 | 2 | \$73.04 |
| Labor | 232 | Equipment Operators, Light | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | \$22.67 | 2 | \$45.34 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 2 | \$39.84 |
| Mobilization | 1145 | Mobilization, Supervisor or Manager | Mobilization of supervisors or management. Includes crew supervisors, foremen and farm/ranch managers, etc. | Hour | \$36.18 | 2 | \$72.36 |
| Mobilization | 1138 | Mobilization, small equipment | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | \$138.58 | 2 | \$277.16 |
| Mobilization | 1142 | Mobilization, General labor | Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.90 | 2 | \$39.80 |
| Foregone Income | 1959 | FI, Corn Dryland | Dryland Corn is Primary Crop | Acre | \$392.59 | 2.5 | \$981.48 |
| Foregone Income | 1961 | FI, Soybeans Dryland | Dryland Soybeans is Primary Crop | Acre | \$385.53 | 2.5 | \$963.83 |

Scenario Worksheet

Practice and Scenario Description:

| Information Type | Data |
|---------------------------|---|
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Forestry |
| Practice Code/Name | 391 - Riparian Forest Buffer |
| Scenario ID | 1 |
| Scenario Name | Direct Seeding |
| Scenario Description | Establish a buffer of trees and/or shrubs to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body and extend the minimum required width. The planting will consist of trees or shrubs planted through direct seeding. Planting rate will be approximately 3000 seed per acre. Payment includes tree seed, equipment and labor to seed, and foregone income for the land taken out of crop production to install the riparian buffer. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching |
| Before Practice Situation | Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife. |
| After Practice Situation | A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the resource concerns of Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation. |
| Scenario Feature Measure | Area of planting |
| Scenario Unit | Acre |
| Scenario Typical Size | 5 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$466.50 | \$93.30 |
| Equipment/Installation | \$437.12 | \$87.42 |
| Labor | \$473.52 | \$94.70 |
| Mobilization | \$523.38 | \$104.68 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$1,945.30 | \$389.06 |
| Total | \$3,845.82 | \$769.16 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|--|---|-------|-----------------|----------|----------|
| Materials | 1871 | Trees and shrubs, seed | Tree or shrub seed, e.g., acorns, to establish trees. Materials only. | Pound | \$3.11 | 150 | \$466.50 |
| Equipment/Installation | 1601 | Mechanical nut planter | Mechanical nut planter for direct seeding of trees and shrubs. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor. | Hour | \$9.85 | 8 | \$78.80 |
| Equipment/Installation | 939 | Truck, Pickup | Equipment and power unit costs. Labor not included. | Hour | \$25.51 | 8 | \$204.08 |
| Equipment/Installation | 963 | Tractor, agricultural, 60 HP | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | \$19.28 | 8 | \$154.24 |
| Labor | 234 | Supervisor or Manager | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | \$36.52 | 8 | \$292.16 |
| Labor | 232 | Equipment Operators, Light | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | \$22.67 | 8 | \$181.36 |
| Mobilization | 1145 | Mobilization, Supervisor or Manager | Mobilization of supervisors or management. Includes crew supervisors, foremen and farm/ranch managers, etc. | Hour | \$36.18 | 2 | \$72.36 |
| Mobilization | 1143 | Mobilization, Light Equipment Operator | Mobilization of light equipment operators: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | \$22.46 | 2 | \$44.92 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 2 | \$406.10 |
| Foregone Income | 1959 | FI, Corn Dryland | Dryland Corn is Primary Crop | Acre | \$392.59 | 2.5 | \$981.48 |
| Foregone Income | 1961 | FI, Soybeans Dryland | Dryland Soybeans is Primary Crop | Acre | \$385.53 | 2.5 | \$963.83 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agronomy |
| Practice Code/Name | 393 - Filter Strip |
| Scenario ID | 7 |
| Scenario Name | Introduced species, No Fertility Required - Organic |
| Scenario Description | A strip or area of Introduced herbaceous vegetation situated between cropland, grazing land or disturbed land and sensitive areas. Current soil test indicates that fertility is not necessary for vegetation establishment. Practice includes seedbed prep, planting of introduced species and foregone income for land removed from production. |
| Before Practice Situation | Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring non-ag properties. Water Quality resource concerns are associated with this practice. |
| After Practice Situation | The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of introduced species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and operation and maintenance to maintain the vegetation and the function of the filter strip. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas. The area of the filter strip is taken out of production. |
| Scenario Feature Measure | Number of acres |
| Scenario Unit | Acre |
| Scenario Typical Size | 1 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$182.16 | \$182.16 |
| Equipment/Installation | \$28.71 | \$28.71 |
| Labor | \$0.00 | \$0.00 |
| Mobilization | \$0.00 | \$0.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$389.06 | \$389.06 |
| Total | \$599.93 | \$599.93 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|---|-------|-----------------|----------|----------|
| Materials | 114 | Certified Organic, Alfalfa (Medicago sativa) | Introduced Legumes and shipping. | Pound | \$4.38 | 12 | \$52.56 |
| Materials | 98 | Certified Organic, Fescue, Tall (Festuca arundinacea) | Introduced Perennial Grasses and shipping. | Pound | \$4.32 | 30 | \$129.60 |
| Equipment/Installation | 960 | Seeding Operation, No Till/Grass Drill | No Till drill or grass drill for seeding. Includes all costs for equipment, power unit, and labor. | Acre | \$19.08 | 1 | \$19.08 |
| Equipment/Installation | 945 | Tillage, Light | Includes light disking (tandem) or field cultivator. Equipment and power unit costs. Labor is included. | Acre | \$9.63 | 1 | \$9.63 |
| Foregone Income | 1959 | FI, Corn Dryland | Dryland Corn is Primary Crop | Acre | \$392.59 | 0.5 | \$196.30 |
| Foregone Income | 1961 | FI, Soybeans Dryland | Dryland Soybeans is Primary Crop | Acre | \$385.53 | 0.5 | \$192.77 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agronomy |
| Practice Code/Name | 393 - Filter Strip |
| Scenario ID | 5 |
| Scenario Name | Introduced species, No Fertility Required |
| Scenario Description | A strip or area of Introduced herbaceous vegetation situated between cropland, grazing land or disturbed land and sensitive areas. Current soil test indicates that fertility is not necessary for vegetation establishment. Practice includes seedbed prep planting of introduced species and foregone income for land removed from production. |
| Before Practice Situation | Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring non-ag properties. Water Quality resource concerns are associated with this practice. |
| After Practice Situation | The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of introduced species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and operation and maintenance to maintain the vegetation and the function of the filter strip. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas. The area of the filter strip is taken out of production. |
| Scenario Feature Measure | Number of acres |
| Scenario Unit | Acre |
| Scenario Typical Size | 1 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$114.84 | \$114.84 |
| Equipment/Installation | \$25.58 | \$25.58 |
| Labor | \$0.00 | \$0.00 |
| Mobilization | \$0.00 | \$0.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$389.06 | \$389.06 |
| Total | \$529.48 | \$529.48 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|--|--|-------|-----------------|----------|----------|
| Materials | 87 | Fescue, Tall (Festuca arundinacea) | Introduced Perennial Grasses and shipping. | Pound | \$1.80 | 30 | \$54.00 |
| Materials | 104 | Alfalfa (Medicago sativa) | Introduced Legumes and shipping. | Pound | \$4.15 | 12 | \$49.80 |
| Materials | 334 | Herbicide, Glyphosate | A broad-spectrum, non-selective systemic herbicide. Product is typically used in these practices 340, 645, 314, 666, and 512. Refer to WIN-PST for product names and active ingredients. Materials only. | Acre | \$11.04 | 1 | \$11.04 |
| Equipment/Installation | 960 | Seeding Operation, No Till/Grass Drill | No Till drill or grass drill for seeding. Includes all costs for equipment, power unit, and labor. | Acre | \$19.08 | 1 | \$19.08 |
| Equipment/Installation | 948 | Chemical, ground application | Chemical application performed by ground equipment. Equipment and labor costs included. | Acre | \$6.50 | 1 | \$6.50 |
| Foregone Income | 1959 | FI, Corn Dryland | Dryland Corn is Primary Crop | Acre | \$392.59 | 0.5 | \$196.30 |
| Foregone Income | 1961 | FI, Soybeans Dryland | Dryland Soybeans is Primary Crop | Acre | \$385.53 | 0.5 | \$192.77 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|----------------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Forestry |
| Practice Code/Name | 394 - Firebreak |
| Scenario ID | 1 |
| Scenario Name | Constructed - Light Equipment |
| Scenario Description | Installation of a bare-ground firebreak of a minimum width of 15' around a 20 acre field/farm using farm equipment (2 passes). Generally water control devices such as water bars are not needed due either to the lack of steep terrain or the temporary nature of the firebreak. Resource concerns include Wildfire hazard from excessive biomass accumulation, Undesirable plant productivity and health, Inadequate plant structure and composition, and Habitat degradation. |
| Before Practice Situation | Tract, field, or farm lacks adequate firebreaks to either reduce the spread of wildfires or contain a prescribed burn. Installation will be accomplished by making two passes with the use of typical farm equipment such as tractors, plows, disks, or similar implements. |
| After Practice Situation | The property is adequately protected from wildfire or can be safely prescribe burned. |
| Scenario Feature Measure | Length of firebreak |
| Scenario Unit | Feet |
| Scenario Typical Size | 4000 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|-----------------|--------------------|
| Materials | \$0.00 | \$0.00 |
| Equipment/Installation | \$48.18 | \$0.01 |
| Labor | \$0.00 | \$0.00 |
| Mobilization | \$56.22 | \$0.01 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$104.40 | \$0.03 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|------------------------------------|--|------|-----------------|----------|---------|
| Equipment/Installation | 945 | Tillage, Light | Includes light disking (tandem) or field cultivator. Equipment and power unit costs. Labor is included. | Acre | \$9.63 | 2 | \$19.26 |
| Equipment/Installation | 946 | Tillage, Primary | Includes heavy disking (offset) or chisel plow, Equipment and power unit costs. Labor is included. | Acre | \$14.46 | 2 | \$28.92 |
| Mobilization | 1137 | Mobilization, very small equipment | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | \$56.22 | 1 | \$56.22 |

Scenario Worksheet

Practice and Scenario Description:

| Information Type | Data |
|---------------------------|--|
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Forestry |
| Practice Code/Name | 394 - Firebreak |
| Scenario ID | 4 |
| Scenario Name | Vegetated permanent firebreak |
| Scenario Description | Establishing a 20 foot wide strip of permanent vegetation that will serve as a green firebreak. scenario includes clearing the site, preparing the seedbed, seeding (typically cool season grasses and/or legumes), and applying needed soil amendments. Clearing will be achieved with the use of a bush hog or similar equipment. Seedbed preparation and vegetation establishment will be accomplished with farm equipment. Soil amendments will be applied according to local FOTG guidance. This scenario does not include follow-up maintenance operations such as weed control, mowing, etc. Resource concerns include Wildfire hazard from excessive biomass accumulation, Soil erosion, and Excessive sediment in surface waters. |
| Before Practice Situation | Tract, field, or farm lacks adequate firebreaks to either reduce the spread of wildfires or contain a prescribed burn. |
| After Practice Situation | The property is adequately protected from wildfire or can be safely prescribe burned. Wildlife habitat will also be enhanced and the potential for erosion from the firebreak is minimized. |
| Scenario Feature Measure | Length of firebreak |
| Scenario Unit | Feet |
| Scenario Typical Size | 3000 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$201.99 | \$0.07 |
| Equipment/Installation | \$267.96 | \$0.09 |
| Labor | \$79.68 | \$0.03 |
| Mobilization | \$214.70 | \$0.07 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$764.33 | \$0.25 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|--|--|-------|-----------------|----------|----------|
| Materials | 92 | Orchard Grass (Dactylis glomerata) | Introduced Perennial Grasses and shipping. | Pound | \$2.04 | 2 | \$4.08 |
| Materials | 105 | Alsike Clover (Trifolium hybridum) | Introduced Legumes and shipping. | Pound | \$3.06 | 2 | \$6.12 |
| Materials | 83 | Wild Rye, Canada (Elymus canadensis) | Native Grasses and shipping. | Pound | \$9.32 | 2.5 | \$23.30 |
| Materials | 73 | Phosphorus, P2O5 | Superphosphate 44-46% P2O5. Price is per pound of P2O5.. | Pound | \$0.65 | 60 | \$39.00 |
| Materials | 112 | Red Clover (Trifolium pratense) | Introduced Legumes and shipping. | Pound | \$2.60 | 3 | \$7.80 |
| Materials | 71 | Nitrogen (N), Urea | Urea. Price is per pound of N. | Pound | \$0.60 | 30 | \$18.00 |
| Materials | 74 | Potassium, K2O | Muriate Of Potash 60-62% K2O. Price is per pound of P2O5. | Pound | \$0.52 | 60 | \$31.20 |
| Materials | 75 | Lime, ENM | Fertilizer: Limestone Spread on field. | Ton | \$23.98 | 2 | \$47.96 |
| Materials | 84 | Wild Rye, Virginia (Elymus virginicus) | Native Grasses and shipping. | Pound | \$9.81 | 2.5 | \$24.53 |
| Equipment/Installation | 945 | Tillage, Light | Includes light disking (tandem) or field cultivator. Equipment and power unit costs. Labor is included. | Acre | \$9.63 | 2 | \$19.26 |
| Equipment/Installation | 946 | Tillage, Primary | Includes heavy disking (offset) or chisel plow, Equipment and power unit costs. Labor is included. | Acre | \$14.46 | 4 | \$57.84 |
| Equipment/Installation | 950 | Fertilizer, ground application, dry bulk | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | \$5.70 | 1 | \$5.70 |
| Equipment/Installation | 960 | Seeding Operation, No Till/Grass Drill | No Till drill or grass drill for seeding. Includes all costs for equipment, power unit, and labor. | Acre | \$19.08 | 1 | \$19.08 |
| Equipment/Installation | 940 | Mower, Bush Hog | Equipment and power unit costs. Labor not included. | Hours | \$41.52 | 4 | \$166.08 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | \$19.92 | 4 | \$79.68 |
| Mobilization | 1142 | Mobilization, General labor | Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.90 | 1 | \$19.90 |
| Mobilization | 1138 | Mobilization, small equipment | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | \$138.58 | 1 | \$138.58 |
| Mobilization | 1137 | Mobilization, very small equipment | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | \$56.22 | 1 | \$56.22 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Wildlife Wetland |
| Practice Code/Name | 396 - Aquatic Organism Passage |
| Scenario ID | 1 |
| Scenario Name | Concrete Dam Removal |
| Scenario Description | The full or partial removal of a concrete or earthen dam which is restricting or impeding movement of aquatic organisms to restore aquatic organism passage, improve water quality, and promote functional river ecology and geomorphology. The extent of removal (full or partial) is determined through consultations with the dam owner in consideration of prevailing regulations and site historical status. Adjacent floodplain surfaces above and below the target dam are considered in the planning process to account for shifts in streamflow and geomorphic regime. Resulting channel dimensions and profile are determined on a site-specific basis to reflect--to the fullest extent possible--pre-dam conditions. Removal is completed with an assortment of equipment, including tracked excavators outfitted with hydraulic chisels, hammers and/or buckets with "thumbs", bull dozers, skid steers, cranes, front-end loaders, and dump trucks. Alternative demolition techniques may include the use of high explosives, diamond-chain, or similar circular saws to remove the dam in a piecewise manner. Removed materials are trucked away and disposed or recycled off-site. Associated practices for practice installation include: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment, (395) Stream Habitat Improvement and Management, (410) Grade |
| Before Practice Situation | A channel-spanning concrete dam no longer has functional use, may be failing, or creates a hazard to downstream capital infrastructure or communities. The dam blocks upstream aquatic organism migration, and downstream migrants may be diverted into hydraulic structures that increase mortality or result in migration delays or dead-ends. The dam disrupts the downstream cycling and transport of sediment, woody material and nutrients. The pool created by the dam may impair water quality by increasing temperatures, capturing fine sediment--sometimes laden with heavy metals or other pollutants--later mobilized by high flow events, and creating slackwater habitat for invasive aquatic vegetation. Non-native or exotic fish species inhabit the pool and predate upon and/or displace native fish. Resource concerns include habitat degradation; Ponding, flooding, seasonal high water table, seeps, drifted snow, and Elevated water temperature. |
| After Practice Situation | A 7 foot tall, 85 foot long low head concrete dam is demolished and debris is removed. The geometry and slope of the reach impacted by removal of the dam are restored to pre-dam conditions to the fullest extent practicable. Aquatic organism passage and river ecology and geomorphic conditions are restored to pre-dam conditions to the fullest extent practicable. Resource Concerns are addressed within the context of the site. |
| Scenario Feature Measure | Linear Feet of Low Head Dam and Abutments |
| Scenario Unit | Linear Foot |
| Scenario Typical Size | 85 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$0.00 | \$0.00 |
| Equipment/Installation | \$22,210.00 | \$261.29 |
| Labor | \$9,447.20 | \$111.14 |
| Mobilization | \$1,372.42 | \$16.15 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$33,029.62 | \$388.58 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|---|--------------------|-----------------|----------|------------|
| Equipment/Installation | 1615 | Hauling, bulk, highway truck | Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck. | Cubic Yard Mile | \$0.27 | 9200 | \$2,484.00 |
| Equipment/Installation | 1215 | Truck, dump, 12 CY | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hour | \$70.68 | 80 | \$5,654.40 |
| Equipment/Installation | 40 | Clearing and Grubbing | Clearing and Grubbing, includes materials, equipment and labor | Acre | \$278.13 | 1.5 | \$417.20 |
| Equipment/Installation | 969 | Water management, Flooding & dewatering | Includes equipment and labor costs. | Acre Foot | \$138.20 | 4 | \$552.80 |
| Equipment/Installation | 933 | Skidsteer, 80 HP | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | \$33.99 | 60 | \$2,039.40 |
| Equipment/Installation | 932 | Hydraulic Excavator, 2 CY | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hour | \$151.43 | 60 | \$9,085.80 |
| Equipment/Installation | 927 | Dozer, 140 HP | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hour | \$98.82 | 20 | \$1,976.40 |
| Labor | 230 | Skilled Labor | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | \$31.31 | 80 | \$2,504.80 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 60 | \$1,195.20 |

| | | | | | | | |
|--------------|------|--|--|------|----------|-----|------------|
| Labor | 234 | Supervisor or Manager | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | \$36.52 | 40 | \$1,460.80 |
| Labor | 233 | Equipment Operators, Heavy | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.79 | 160 | \$4,286.40 |
| Mobilization | 1140 | Mobilization, large equipment | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | \$379.78 | 1 | \$379.78 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 2 | \$406.10 |
| Mobilization | 1145 | Mobilization, Supervisor or Manager | Mobilization of supervisors or management. Includes crew supervisors, foremen and farm/ranch managers, etc. | Hour | \$36.18 | 8 | \$289.44 |
| Mobilization | 1141 | Mobilization, Skilled labor | Mobilization of skilled labor: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | \$30.48 | 3 | \$91.44 |
| Mobilization | 1142 | Mobilization, General labor | Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.90 | 5 | \$99.50 |
| Mobilization | 1144 | Mobilization, Heavy Equipment Operator | Mobilization of heavy equipment operators: Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.54 | 4 | \$106.16 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Wildlife Wetland |
| Practice Code/Name | 396 - Aquatic Organism Passage |
| Scenario ID | 2 |
| Scenario Name | Culvert Replacement |
| Scenario Description | A corrugated metal (galvanized steel or aluminum) pipe culvert (CMP) of any shape (round, elliptical, or squash) used where a new access road intersects with a stream crossing. The aquatic organism passage (AOP) will provide and promote stream ecological and geomorphic function. CMPs used for AOP are filled with a mixture of rock and gravel sized to emulate site stream conditions and geomorphic units in the channel. The simulated streambed material is continuous throughout the culvert barrel, and blended with the intact streambed at the culvert inlet and outlet. Any associated road surface reinstatement is not included as part of this practice. If the reinstatement of a field access lane is needed, consider the planning and application of the associated road surface reinstatement through (560) Access Road. Other associated practices include, but is not limited to (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; (395) Stream Habitat Improvement and Management, (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection. |
| Before Practice Situation | An existing undersized culvert has contributed to general bed and bank scour downstream of a road crossing, and may have contributed to deposition of sediment upstream of the road crossing, or has been designed for typical stormwater capacity, but is inadequate for proper aquatic organism passage. An undersized culvert is causing the associated road to be overtopped by high flows, resulting in outright failure and landowner accessibility problems. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and sediment deposition. An inadequately sized culvert results in native aquatic organisms being unable to pass through the road crossing because the culvert outlet is perched above the downstream pool, and high velocities are not negotiable by animals that are able to leap into the culvert barrel. Resource concerns addressed include: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature; SOIL EROSION– Excessive bank erosion from streams shorelines or water conveyance channels. |
| After Practice Situation | The undersized culvert is replaced with a CMP sized, placed, and backfilled with material determined by geomorphic analyses performed in a reference upstream reach of the crossing location. Geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. In addition, because the culvert is sized to transport the streamflow, the culvert requires decreased maintenance activities over time. Landowners are able to access their property across a range of flows, and are able to seek and receive emergency and post-flood recovery services. |
| Scenario Feature Measure | CMP |
| Scenario Unit | Each |
| Scenario Typical Size | 1 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$2,102.60 | \$2,102.60 |
| Equipment/Installation | \$1,410.66 | \$1,410.66 |
| Labor | \$405.50 | \$405.50 |
| Mobilization | \$893.50 | \$893.50 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$4,812.26 | \$4,812.26 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---------------------------------------|--|------------|-----------------|----------|------------|
| Materials | 1834 | Aggregate, river rock | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery | Ton | \$31.65 | 4 | \$126.60 |
| Materials | 1589 | Pipe, CMP, 14-12 gauge, weight priced | 14 and 12 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only. | Pound | \$0.76 | 2600 | \$1,976.00 |
| Equipment/Installation | 50 | Earthfill, Manually Compacted | Earthfill, manually compacted, includes equipment and labor | Cubic yard | \$5.23 | 96 | \$502.08 |
| Equipment/Installation | 932 | Hydraulic Excavator, 2 CY | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hour | \$151.43 | 6 | \$908.58 |
| Labor | 230 | Skilled Labor | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | \$31.31 | 4 | \$125.24 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 6 | \$119.52 |
| Labor | 233 | Equipment Operators, Heavy | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.79 | 6 | \$160.74 |
| Mobilization | 1140 | Mobilization, large equipment | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | \$379.78 | 2 | \$759.56 |

| | | | | | | | |
|--------------|------|--|--|------|---------|---|---------|
| Mobilization | 1141 | Mobilization, Skilled labor | Mobilization of skilled labor: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | \$30.48 | 2 | \$60.96 |
| Mobilization | 1142 | Mobilization, General labor | Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.90 | 1 | \$19.90 |
| Mobilization | 1144 | Mobilization, Heavy Equipment Operator | Mobilization of heavy equipment operators: Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.54 | 2 | \$53.08 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Engineering General |
| Practice Code/Name | 410 - Grade Stabilization Structure |
| Scenario ID | 13 |
| Scenario Name | Concrete Block Chute |
| Scenario Description | A full flow chute structure with concrete blocks, geotextile fabric, and earthfill/earthmoving. To stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon typical chute designed to handle 65 cfs (10' BW, 5' Drop). 518 Concrete blocks required. Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Cost data is applicable to organic and convention agricultural production systems. |
| Before Practice Situation | The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss. |
| After Practice Situation | Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate. |
| Scenario Feature Measure | Square feet of concrete block lined area |
| Scenario Unit | Square Foot |
| Scenario Typical Size | 460 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$1,060.10 | \$2.30 |
| Equipment/Installation | \$1,841.20 | \$4.00 |
| Labor | \$1,057.14 | \$2.30 |
| Mobilization | \$242.85 | \$0.53 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$4,201.29 | \$9.13 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---------------------------------|--|-------------|-----------------|----------|------------|
| Materials | 253 | Block, concrete | Concrete block, hollow, normal weight, 3500 psi. Includes both full and partial sizes. Material only | Each | \$1.60 | 518 | \$828.80 |
| Materials | 45 | Aggregate, Sand, Graded, Washed | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic yard | \$25.70 | 9 | \$231.30 |
| Equipment/Installation | 42 | Geotextile, woven | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | \$2.35 | 52 | \$122.20 |
| Equipment/Installation | 931 | Hydraulic Excavator, 1 CY | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hour | \$90.50 | 6 | \$543.00 |
| Equipment/Installation | 49 | Earthfill, Roller Compacted | Earthfill, roller or machine compacted, includes equipment and labor | Cubic yard | \$3.92 | 300 | \$1,176.00 |
| Labor | 233 | Equipment Operators, Heavy | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.79 | 6 | \$160.74 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 45 | \$896.40 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 1 | \$203.05 |
| Mobilization | 1142 | Mobilization, General labor | Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.90 | 2 | \$39.80 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Engineering General |
| Practice Code/Name | 410 - Grade Stabilization Structure |
| Scenario ID | 12 |
| Scenario Name | Concrete Drop Structure |
| Scenario Description | A Straight or Box Drop structure composed of reinforced concrete used to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a concrete box drop structure with a drop of 4ft and weir length of 16ft. The unit of payment measurement is cubic yards of concrete placed. Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation. |
| Before Practice Situation | The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss. |
| After Practice Situation | Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate. |
| Scenario Feature Measure | Cubic Yard of Concrete |
| Scenario Unit | Cubic Yard |
| Scenario Typical Size | 12 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$1,525.60 | \$127.13 |
| Equipment/Installation | \$7,308.36 | \$609.03 |
| Labor | \$214.32 | \$17.86 |
| Mobilization | \$406.32 | \$33.86 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$9,454.60 | \$787.88 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|---|-------------|-----------------|----------|------------|
| Materials | 1200 | Rock Riprap, graded, angular, material and shipping | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | \$28.91 | 50 | \$1,445.50 |
| Materials | 46 | Aggregate, Gravel, Graded | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic yard | \$26.70 | 3 | \$80.10 |
| Equipment/Installation | 38 | Concrete, CIP, formed reinforced | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic yard | \$406.16 | 12 | \$4,873.92 |
| Equipment/Installation | 42 | Geotextile, woven | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | \$2.35 | 20 | \$47.00 |
| Equipment/Installation | 932 | Hydraulic Excavator, 2 CY | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hour | \$151.43 | 8 | \$1,211.44 |
| Equipment/Installation | 49 | Earthfill, Roller Compacted | Earthfill, roller or machine compacted, includes equipment and labor | Cubic yard | \$3.92 | 300 | \$1,176.00 |
| Labor | 233 | Equipment Operators, Heavy | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.79 | 8 | \$214.32 |
| Mobilization | 1140 | Mobilization, large equipment | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | \$379.78 | 1 | \$379.78 |
| Mobilization | 1144 | Mobilization, Heavy Equipment Operator | Mobilization of heavy equipment operators: Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.54 | 1 | \$26.54 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Engineering General |
| Practice Code/Name | 410 - Grade Stabilization Structure |
| Scenario ID | 15 |
| Scenario Name | Concrete Drop Box with PVC outlet pipe |
| Scenario Description | PVC pipe drop structure with reinforced concrete drop box inlet for transferring runoff from higher to lower elevations to prevent headcutting and gully erosion. Structure is designed for 7 cubic feet per second and has a 5' overfall, 2'x2'x3' drop box and 12" diameter PVC outlet pipe. Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. |
| Before Practice Situation | The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss. |
| After Practice Situation | Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate. |
| Scenario Feature Measure | Feet of pipe |
| Scenario Unit | Foot |
| Scenario Typical Size | 40 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$1,180.10 | \$29.50 |
| Equipment/Installation | \$746.08 | \$18.65 |
| Labor | \$160.74 | \$4.02 |
| Mobilization | \$203.05 | \$5.08 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$2,289.97 | \$57.25 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|---|------------|-----------------|----------|----------|
| Materials | 1200 | Rock Riprap, graded, angular, material and shipping | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | \$28.91 | 2.2 | \$63.60 |
| Materials | 1252 | Pipe, PVC, 12", SDR 35 | Pipe, PVC, SDR 35, 12" Diameter - ASTM D3034. Material cost only. | Foot | \$20.57 | 40 | \$822.80 |
| Materials | 46 | Aggregate, Gravel, Graded | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic yard | \$26.70 | 11 | \$293.70 |
| Equipment/Installation | 38 | Concrete, CIP, formed reinforced | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic yard | \$406.16 | 0.5 | \$203.08 |
| Equipment/Installation | 931 | Hydraulic Excavator, 1 CY | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hour | \$90.50 | 6 | \$543.00 |
| Labor | 233 | Equipment Operators, Heavy | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.79 | 6 | \$160.74 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 1 | \$203.05 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Engineering General |
| Practice Code/Name | 410 - Grade Stabilization Structure |
| Scenario ID | 3 |
| Scenario Name | Embankment, >12 |
| Scenario Description | An earthen embankment dam with a principle spillway pipe greater than 12 inches with anti-seep collars or sand diaphragm. Installed to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 11,000 cubic yards (including core trench backfill), 120 feet of 18" Steel pipe with a canopy inlet, and 16 cubic yard sand diaphragm with outlet. Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation. |
| Before Practice Situation | The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss. |
| After Practice Situation | Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as: Fence (382), Grassed Waterway (412) will use the corresponding Standard(s) as appropriate. |
| Scenario Feature Measure | Cubic Yards of Earthfill |
| Scenario Unit | Cubic Yard |
| Scenario Typical Size | 11000 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$5,194.40 | \$0.47 |
| Equipment/Installation | \$31,239.55 | \$2.84 |
| Labor | \$6,009.18 | \$0.55 |
| Mobilization | \$665.37 | \$0.06 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$43,108.50 | \$3.92 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|------------------------------------|--|------------|-----------------|----------|-------------|
| Materials | 1358 | Pipe, Steel, 18", Std Wt, USED | Materials: - USED - 18" - Steel Std Wt | Foot | \$39.86 | 120 | \$4,783.20 |
| Materials | 45 | Aggregate, Sand, Graded, Washed | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic yard | \$25.70 | 16 | \$411.20 |
| Equipment/Installation | 928 | Dozer, 200 HP | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hour | \$150.27 | 170 | \$25,545.90 |
| Equipment/Installation | 927 | Dozer, 140 HP | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hour | \$98.82 | 24 | \$2,371.68 |
| Equipment/Installation | 931 | Hydraulic Excavator, 1 CY | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hour | \$90.50 | 8 | \$724.00 |
| Equipment/Installation | 50 | Earthfill, Manually Compacted | Earthfill, manually compacted, includes equipment and labor | Cubic yard | \$5.23 | 29 | \$151.67 |
| Equipment/Installation | 1206 | Scraper, pull, 7 CY | Pull type earthmoving scraper with 7 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 160 HP typically required for single scraper. | Hour | \$14.39 | 170 | \$2,446.30 |
| Labor | 233 | Equipment Operators, Heavy | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.79 | 202 | \$5,411.58 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 30 | \$597.60 |
| Mobilization | 1137 | Mobilization, very small equipment | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | \$56.22 | 1 | \$56.22 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 3 | \$609.15 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Engineering General |
| Practice Code/Name | 410 - Grade Stabilization Structure |
| Scenario ID | 1 |
| Scenario Name | Embankment, 4-6 Pipe |
| Scenario Description | An earthen embankment dam with a principal spillway pipe (PVC or Steel) of 6 inches or less with antiseep collars. To stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 5,000 cubic yards (including core trench backfill), and 100 feet of pipe 6" PVC pipe with a canopy inlet. A small, non-lined plunge pool protects the outlet channel. Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation. |
| Before Practice Situation | The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss. |
| After Practice Situation | Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as: Fence (382), Grassed Waterway (412), will use the corresponding Standard(s) as appropriate. |
| Scenario Feature Measure | Cubic Yards of Earthfill |
| Scenario Unit | Cubic Yard |
| Scenario Typical Size | 5000 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$730.50 | \$0.15 |
| Equipment/Installation | \$13,738.64 | \$2.75 |
| Labor | \$2,503.14 | \$0.50 |
| Mobilization | \$406.10 | \$0.08 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$17,378.38 | \$3.48 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|--------------------------------|--|-------------|-----------------|----------|-------------|
| Materials | 1047 | Steel, Plate, 1/8" | Flat Steel Plate, 1/8" thick, materials only. | Square Foot | \$4.15 | 50 | \$207.50 |
| Materials | 980 | Pipe, PVC, 6", SCH 40 | Materials: - 6" - PVC - SCH 40 - ASTM D1785 | Foot | \$5.23 | 100 | \$523.00 |
| Equipment/Installation | 928 | Dozer, 200 HP | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hour | \$150.27 | 78 | \$11,721.06 |
| Equipment/Installation | 927 | Dozer, 140 HP | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hour | \$98.82 | 8 | \$790.56 |
| Equipment/Installation | 50 | Earthfill, Manually Compacted | Earthfill, manually compacted, includes equipment and labor | Cubic yard | \$5.23 | 20 | \$104.60 |
| Equipment/Installation | 1206 | Scraper, pull, 7 CY | Pull type earthmoving scraper with 7 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 160 HP typically required for single scraper. | Hour | \$14.39 | 78 | \$1,122.42 |
| Labor | 233 | Equipment Operators, Heavy | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.79 | 86 | \$2,303.94 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 10 | \$199.20 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 2 | \$406.10 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Engineering General |
| Practice Code/Name | 410 - Grade Stabilization Structure |
| Scenario ID | 2 |
| Scenario Name | Embankment, 8-12 Pipe |
| Scenario Description | An earthen embankment dam with a principal spillway pipe (PVC or Steel) of 8" to 12" with antiseep collars. To stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 8000 cubic yards(including core trench backfill), and 100 feet of pipe 10" PVC pipe with a canopy inlet. A small, non-lined plunge pool protects the outlet channel. Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation. |
| Before Practice Situation | The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss. |
| After Practice Situation | Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as: Fence (382), Grassed Waterway (412) will use the corresponding Standard(s) as appropriate. |
| Scenario Feature Measure | Cubic Yards of Earthfill |
| Scenario Unit | Cubic Yard |
| Scenario Typical Size | 8000 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$1,967.80 | \$0.25 |
| Equipment/Installation | \$22,479.35 | \$2.81 |
| Labor | \$4,176.48 | \$0.52 |
| Mobilization | \$609.15 | \$0.08 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$29,232.78 | \$3.65 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|--------------------------------|--|-------------|-----------------|----------|-------------|
| Materials | 1351 | Pipe, PVC, 10", SCH 80 | Materials: - 10" - PVC - SCH 80 - ASTM D1785 | Foot | \$16.69 | 100 | \$1,669.00 |
| Materials | 1047 | Steel, Plate, ¼" | Flat Steel Plate, ¼" thick, materials only. | Square Foot | \$4.15 | 72 | \$298.80 |
| Equipment/Installation | 50 | Earthfill, Manually Compacted | Earthfill, manually compacted, includes equipment and labor | Cubic yard | \$5.23 | 29 | \$151.67 |
| Equipment/Installation | 928 | Dozer, 200 HP | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hour | \$150.27 | 124 | \$18,633.48 |
| Equipment/Installation | 931 | Hydraulic Excavator, 1 CY | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hour | \$90.50 | 8 | \$724.00 |
| Equipment/Installation | 927 | Dozer, 140 HP | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hour | \$98.82 | 12 | \$1,185.84 |
| Equipment/Installation | 1206 | Scraper, pull, 7 CY | Pull type earthmoving scraper with 7 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 160 HP typically required for single scraper. | Hour | \$14.39 | 124 | \$1,784.36 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 16 | \$318.72 |
| Labor | 233 | Equipment Operators, Heavy | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.79 | 144 | \$3,857.76 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 3 | \$609.15 |

Scenario Worksheet

Practice and Scenario Description:

| Information Type | Data |
|---------------------------|--|
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Engineering General |
| Practice Code/Name | 410 - Grade Stabilization Structure |
| Scenario ID | 4 |
| Scenario Name | Embankment, Tile Conduit |
| Scenario Description | An earthen embankment dam with a 6" HDPE corrugated plastic tubing principal spillway conduit. To stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 3100 cubic yards (including core trench backfill), and 80 feet of 6" CPT with a plastic inlet. A small, non-lined plunge pool protects the outlet channel. Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation. |
| Before Practice Situation | The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss. |
| After Practice Situation | Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as: Fence (382), Grassed Waterway (412), Water and Sediment Control Basin (638) will use the corresponding Standard(s) as appropriate. |
| Scenario Feature Measure | Cubic Yards of Earthfill |
| Scenario Unit | Cubic Yard |
| Scenario Typical Size | 3100 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$191.00 | \$0.06 |
| Equipment/Installation | \$6,000.52 | \$1.94 |
| Labor | \$1,766.76 | \$0.57 |
| Mobilization | \$419.37 | \$0.14 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$8,377.65 | \$2.70 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|--|--|------------|-----------------|----------|------------|
| Materials | 1242 | Pipe, HDPE, 6", CPT, Single Wall | Pipe, Corrugated Plastic Tubing, Single Wall, 6" diameter - ASTM F405. Material cost only. | Foot | \$1.08 | 80 | \$86.40 |
| Materials | 980 | Pipe, PVC, 6", SCH 40 | Materials: - 6" - PVC - SCH 40 - ASTM D1785 | Foot | \$5.23 | 20 | \$104.60 |
| Equipment/Installation | 927 | Dozer, 140 HP | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hour | \$98.82 | 56 | \$5,533.92 |
| Equipment/Installation | 931 | Hydraulic Excavator, 1 CY | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hour | \$90.50 | 4 | \$362.00 |
| Equipment/Installation | 50 | Earthfill, Manually Compacted | Earthfill, manually compacted, includes equipment and labor | Cubic yard | \$5.23 | 20 | \$104.60 |
| Labor | 233 | Equipment Operators, Heavy | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.79 | 60 | \$1,607.40 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 8 | \$159.36 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 2 | \$406.10 |
| Mobilization | 1144 | Mobilization, Heavy Equipment Operator | Mobilization of heavy equipment operators: Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.54 | 0.5 | \$13.27 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Engineering General |
| Practice Code/Name | 410 - Grade Stabilization Structure |
| Scenario ID | 5 |
| Scenario Name | Pipe Drop, Smooth Steel or CMP |
| Scenario Description | A full flow pipe drop (ie. riser and barrel) grade stabilization structure designed and constructed with a sand diaphragm. This is typically a earthen dry dam structure with no permanent storage (water or sediment), however some structures may have some permanent pool / storage but do not have 35 years of sediment life. Payment rate is based upon the riser weir length (Diameter x 3.14) in feet times the length of the pipe barrel in (feet). Installed to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a smooth steel or corrugated metal pipe drop structure with a 36", 12' tall riser and a 100' long 24" barrel (Riser Weir length x Barrel Length = 3ft x 3.14 x 100ft = 942). Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation. |
| Before Practice Situation | The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss. |
| After Practice Situation | Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), and Irrigation Canal or Lateral (320) will use the corresponding Standard(s) as appropriate. |
| Scenario Feature Measure | Riser Weir Length x Barrel Length |
| Scenario Unit | Square Foot |
| Scenario Typical Size | 942 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|--------------------|--------------------|
| Materials | \$8,129.11 | \$8.63 |
| Equipment/Installation | \$3,595.08 | \$3.82 |
| Labor | \$650.77 | \$0.69 |
| Mobilization | \$203.05 | \$0.22 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$12,578.01 | \$13.35 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|--|--|-------------|-----------------|----------|------------|
| Materials | 1362 | Pipe, Steel, 36", Std Wt, USED | Materials: - USED - 36" - Steel Std Wt | Foot | \$105.64 | 12 | \$1,267.68 |
| Materials | 1360 | Pipe, Steel, 24", Std Wt, USED | Materials: - USED - 24" - Steel Std Wt | Foot | \$54.27 | 100 | \$5,427.00 |
| Materials | 1048 | Steel, Plate, 3/16" | Flat Steel Plate, 3/16" thick, materials only. | Square Foot | \$6.22 | 16 | \$99.52 |
| Materials | 1609 | Lumber, planks, posts and timbers, treated | Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor. | Board Foot | \$1.17 | 288 | \$336.96 |
| Materials | 45 | Aggregate, Sand, Graded, Washed | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic yard | \$25.70 | 36 | \$925.20 |
| Materials | 1372 | Steel, Angle, 3" x 3" x 1/4" | Materials: Angle, 3" x 3" x 1/4", Meets ASTM A36 | Foot | \$3.21 | 10 | \$32.10 |
| Materials | 1375 | Steel, Plate, 3/8" | Flat steel plate, 3/8" thickness. Materials only. | Square Foot | \$13.55 | 3 | \$40.65 |
| Equipment/Installation | 49 | Earthfill, Roller Compacted | Earthfill, roller or machine compacted, includes equipment and labor | Cubic yard | \$3.92 | 600 | \$2,352.00 |
| Equipment/Installation | 50 | Earthfill, Manually Compacted | Earthfill, manually compacted, includes equipment and labor | Cubic yard | \$5.23 | 100 | \$523.00 |
| Equipment/Installation | 931 | Hydraulic Excavator, 1 CY | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hour | \$90.50 | 4 | \$362.00 |
| Equipment/Installation | 37 | Concrete, CIP, slab on grade, reinforced | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic yard | \$255.77 | 1.4 | \$358.08 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 10 | \$199.20 |
| Labor | 233 | Equipment Operators, Heavy | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.79 | 4 | \$107.16 |

| | | | | | | | |
|--------------|------|--------------------------------|---|------|----------|----|----------|
| Labor | 230 | Skilled Labor | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | \$31.31 | 11 | \$344.41 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 1 | \$203.05 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Engineering General |
| Practice Code/Name | 410 - Grade Stabilization Structure |
| Scenario ID | 10 |
| Scenario Name | Geotextile Reinforced Vegetated Outlet |
| Scenario Description | A full flow chute structure with geotextile fabric, erosion control blanket, riprap outlet and earthfill/earthmoving. To stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon typical chute designed to handle 50 cfs (16' BW, 6:1 Chute Slope, 6' Drop). Amount of geotextile required is 1050 SF. Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Cost data is applicable to organic and convention agricultural production systems. |
| Before Practice Situation | The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss. |
| After Practice Situation | Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate. |
| Scenario Feature Measure | Square Ft of Geotextile lined area |
| Scenario Unit | Square Foot |
| Scenario Typical Size | 1050 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$729.45 | \$0.69 |
| Equipment/Installation | \$1,318.05 | \$1.26 |
| Labor | \$320.10 | \$0.30 |
| Mobilization | \$249.49 | \$0.24 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$2,617.09 | \$2.49 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|--|-------------|-----------------|----------|----------|
| Materials | 1200 | Rock Riprap, graded, angular, material and shipping | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | \$28.91 | 17 | \$491.47 |
| Materials | 1213 | Erosion Control Blanket, biodegradable | Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials only. | Square Yard | \$1.46 | 163 | \$237.98 |
| Equipment/Installation | 42 | Geotextile, woven | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | \$2.35 | 163 | \$383.05 |
| Equipment/Installation | 931 | Hydraulic Excavator, 1 CY | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hour | \$90.50 | 6 | \$543.00 |
| Equipment/Installation | 49 | Earthfill, Roller Compacted | Earthfill, roller or machine compacted, includes equipment and labor | Cubic yard | \$3.92 | 100 | \$392.00 |
| Labor | 233 | Equipment Operators, Heavy | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.79 | 6 | \$160.74 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 8 | \$159.36 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 1 | \$203.05 |
| Mobilization | 1142 | Mobilization, General labor | Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.90 | 1 | \$19.90 |
| Mobilization | 1144 | Mobilization, Heavy Equipment Operator | Mobilization of heavy equipment operators: Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.54 | 1 | \$26.54 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Engineering General |
| Practice Code/Name | 410 - Grade Stabilization Structure |
| Scenario ID | 8 |
| Scenario Name | Grouted Rock Rip Rap Chute |
| Scenario Description | A full flow chute structure with grouted rip rap, geotextile fabric, and earthfill/earthmoving. To stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon typical amount of rock of 46 cubic yards of grouted rip rap. Typical Chute has 10° BW, 6' Drop, with 3" of Grout, 70 CFS capacity. Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Cost data is applicable to organic and convention agricultural production systems. |
| Before Practice Situation | The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss. |
| After Practice Situation | Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate. |
| Scenario Feature Measure | Cubic Yards of rip rap installed |
| Scenario Unit | Cubic Yard |
| Scenario Typical Size | 46 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$1,879.15 | \$40.85 |
| Equipment/Installation | \$1,923.77 | \$41.82 |
| Labor | \$320.10 | \$6.96 |
| Mobilization | \$249.49 | \$5.42 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$4,372.51 | \$95.05 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|--|-------------|-----------------|----------|------------|
| Materials | 1200 | Rock Riprap, graded, angular, material and shipping | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | \$28.91 | 65 | \$1,879.15 |
| Equipment/Installation | 36 | Concrete, CIP, formless, non reinforced | Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic yard | \$125.48 | 9 | \$1,129.32 |
| Equipment/Installation | 42 | Geotextile, woven | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | \$2.35 | 107 | \$251.45 |
| Equipment/Installation | 931 | Hydraulic Excavator, 1 CY | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hour | \$90.50 | 6 | \$543.00 |
| Labor | 233 | Equipment Operators, Heavy | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.79 | 6 | \$160.74 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 8 | \$159.36 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 1 | \$203.05 |
| Mobilization | 1142 | Mobilization, General labor | Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.90 | 1 | \$19.90 |
| Mobilization | 1144 | Mobilization, Heavy Equipment Operator | Mobilization of heavy equipment operators: Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.54 | 1 | \$26.54 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Engineering General |
| Practice Code/Name | 410 - Grade Stabilization Structure |
| Scenario ID | 16 |
| Scenario Name | Open Chute |
| Scenario Description | A full flow chute structure constructed from any type of stabilizing material. To stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon typical chute designed to handle 75 cfs (14' BW, 7:1 Chute Slope, 5' Drop, 18" rock thickness). Amount of rock required is 82 tons. Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Cost data is applicable to organic and convention agricultural production systems. |
| Before Practice Situation | The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss. |
| After Practice Situation | Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate. |
| Scenario Feature Measure | number of structures installed |
| Scenario Unit | Each |
| Scenario Typical Size | 1 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$3,391.85 | \$3,391.85 |
| Equipment/Installation | \$935.00 | \$935.00 |
| Labor | \$280.26 | \$280.26 |
| Mobilization | \$249.49 | \$249.49 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$4,856.60 | \$4,856.60 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|--|------------|-----------------|----------|------------|
| Materials | 1200 | Rock Riprap, graded, angular, material and shipping | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | \$28.91 | 85 | \$2,457.35 |
| Materials | 46 | Aggregate, Gravel, Graded | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic yard | \$26.70 | 35 | \$934.50 |
| Equipment/Installation | 49 | Earthfill, Roller Compacted | Earthfill, roller or machine compacted, includes equipment and labor | Cubic yard | \$3.92 | 100 | \$392.00 |
| Equipment/Installation | 931 | Hydraulic Excavator, 1 CY | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hour | \$90.50 | 6 | \$543.00 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 6 | \$119.52 |
| Labor | 233 | Equipment Operators, Heavy | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.79 | 6 | \$160.74 |
| Mobilization | 1142 | Mobilization, General labor | Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.90 | 1 | \$19.90 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 1 | \$203.05 |
| Mobilization | 1144 | Mobilization, Heavy Equipment Operator | Mobilization of heavy equipment operators: Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.54 | 1 | \$26.54 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Engineering General |
| Practice Code/Name | 410 - Grade Stabilization Structure |
| Scenario ID | 6 |
| Scenario Name | Open Flow Drop Spillway |
| Scenario Description | A Straight or semicircular drop structure composed of metal or reinforced concrete used to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a semicircular steel toe wall structure with a drop of 3ft and weir length of 30ft (90 square feet). The unit of payment measurement is defined as weir length times drop in "feet". The drop (feet) is defined as the structure inlet crest elevation minus the control outlet elevation (ie: outlet apron elevation). Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation. |
| Before Practice Situation | The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss. |
| After Practice Situation | Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate. |
| Scenario Feature Measure | Feet of Weir length times Drop Height |
| Scenario Unit | Square Foot |
| Scenario Typical Size | 90 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|--------------------|--------------------|
| Materials | \$2,964.92 | \$32.94 |
| Equipment/Installation | \$6,062.79 | \$67.36 |
| Labor | \$3,473.27 | \$38.59 |
| Mobilization | \$406.10 | \$4.51 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$12,907.08 | \$143.41 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|--|--|-------------|-----------------|----------|------------|
| Materials | 1200 | Rock Riprap, graded, angular, material and shipping | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | \$28.91 | 11 | \$318.01 |
| Materials | 1376 | Corrugated Steel, 12 Gauge, galvanized | Corrugated Steel, 12 gauge, 3" by 1" corrugations, galvanized, meets ASTM A 929 | Square Foot | \$9.27 | 275 | \$2,549.25 |
| Materials | 46 | Aggregate, Gravel, Graded | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic yard | \$26.70 | 3 | \$80.10 |
| Materials | 1377 | Pipe, CMP, 12", 14 Gauge | 12" - Corrugated Steel Pipe. Galvanized, uncoated. 14 Gauge. Materials only. | Foot | \$8.78 | 2 | \$17.56 |
| Equipment/Installation | 38 | Concrete, CIP, formed reinforced | Steel reinforced concrete formed and cast-in-place in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic yard | \$406.16 | 9 | \$3,655.44 |
| Equipment/Installation | 42 | Geotextile, woven | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | \$2.35 | 13 | \$30.55 |
| Equipment/Installation | 931 | Hydraulic Excavator, 1 CY | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hour | \$90.50 | 8 | \$724.00 |
| Equipment/Installation | 48 | Excavation, Common Earth, side cast, small equipment | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic yard | \$2.12 | 40 | \$84.80 |
| Equipment/Installation | 49 | Earthfill, Roller Compacted | Earthfill, roller or machine compacted, includes equipment and labor | Cubic yard | \$3.92 | 400 | \$1,568.00 |
| Labor | 233 | Equipment Operators, Heavy | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.79 | 8 | \$214.32 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 30 | \$597.60 |

| | | | | | | | |
|--------------|------|--------------------------------|---|------|----------|----|------------|
| Labor | 230 | Skilled Labor | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | \$31.31 | 85 | \$2,661.35 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 2 | \$406.10 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Engineering General |
| Practice Code/Name | 410 - Grade Stabilization Structure |
| Scenario ID | 7 |
| Scenario Name | Rock Rip Rap Chute |
| Scenario Description | A full flow chute structure with rip rap, geotextile fabric, and earthfill/earthmoving. To stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon typical chute designed to handle 90 cfs (20' BW, 5:1 Chute Slope, 5" Drop, 18" rock thickness). Amount of rock required is 86 CY (129 tons). Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Cost data is applicable to organic and convention agricultural production systems. |
| Before Practice Situation | The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss. |
| After Practice Situation | Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate. |
| Scenario Feature Measure | Cubic Yards of rip rap installed |
| Scenario Unit | Cubic Yard |
| Scenario Typical Size | 86 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|-------------------|--------------------|
| Materials | \$3,729.39 | \$43.37 |
| Equipment/Installation | \$1,397.95 | \$16.26 |
| Labor | \$320.10 | \$3.72 |
| Mobilization | \$249.49 | \$2.90 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$5,696.93 | \$66.24 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|--|-------------|-----------------|----------|------------|
| Materials | 1200 | Rock Riprap, graded, angular, material and shipping | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | \$28.91 | 129 | \$3,729.39 |
| Equipment/Installation | 42 | Geotextile, woven | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | \$2.35 | 197 | \$462.95 |
| Equipment/Installation | 931 | Hydraulic Excavator, 1 CY | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hour | \$90.50 | 6 | \$543.00 |
| Equipment/Installation | 49 | Earthfill, Roller Compacted | Earthfill, roller or machine compacted, includes equipment and labor | Cubic yard | \$3.92 | 100 | \$392.00 |
| Labor | 233 | Equipment Operators, Heavy | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.79 | 6 | \$160.74 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 8 | \$159.36 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 1 | \$203.05 |
| Mobilization | 1142 | Mobilization, General labor | Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.90 | 1 | \$19.90 |
| Mobilization | 1144 | Mobilization, Heavy Equipment Operator | Mobilization of heavy equipment operators: Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.54 | 1 | \$26.54 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Engineering General |
| Practice Code/Name | 410 - Grade Stabilization Structure |
| Scenario ID | 14 |
| Scenario Name | Side Inlet |
| Scenario Description | A side inlet drain structure. To stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Typical length of pipe is 30 feet. Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Cost data is applicable to organic and convention agricultural production systems. See the "Grade Stabilization" conservation practice standard. |
| Before Practice Situation | The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss. |
| After Practice Situation | Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Grassed Waterway (412) will use the corresponding Standard(s) as appropriate. |
| Scenario Feature Measure | Length of Pipe installed |
| Scenario Unit | Foot |
| Scenario Typical Size | 30 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$1,195.80 | \$39.86 |
| Equipment/Installation | \$362.00 | \$12.07 |
| Labor | \$186.84 | \$6.23 |
| Mobilization | \$203.05 | \$6.77 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$0.00 | \$0.00 |
| Total | \$1,947.69 | \$64.92 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|--------------------------------|--|------|-----------------|----------|------------|
| Materials | 1358 | Pipe, Steel, 18", Std Wt, USED | Materials: - USED - 18" - Steel Std Wt | Foot | \$39.86 | 30 | \$1,195.80 |
| Equipment/Installation | 931 | Hydraulic Excavator, 1 CY | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hour | \$90.50 | 4 | \$362.00 |
| Labor | 233 | Equipment Operators, Heavy | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | \$26.79 | 4 | \$107.16 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 4 | \$79.68 |
| Mobilization | 1139 | Mobilization, medium equipment | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$203.05 | 1 | \$203.05 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agricultural Engineering |
| Practice Code/Name | 412 - Grassed Waterway |
| Scenario ID | 1 |
| Scenario Name | <35 foot top width |
| Scenario Description | Typical practice is 1 acre, 30' topwidth, 8:1 side slopes, 1.25' depth, 55% excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway. |
| Before Practice Situation | The field has a small gully which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to convey runoff from concentrated flows, terraces, diversions, or water control structures or similar practices to a suitable, stable outlet. |
| After Practice Situation | Installed grassed waterway is 1 acre, 30' topwidth, 8:1 side slopes, 1.25' depth. The practice is installed using a dozer. Critical Area Planting (342) is included for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed according to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If Inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620). |
| Scenario Feature Measure | Acre of Waterway |
| Scenario Unit | Acre |
| Scenario Typical Size | 1 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$0.00 | \$0.00 |
| Equipment/Installation | \$2,059.96 | \$2,059.96 |
| Labor | \$36.52 | \$36.52 |
| Mobilization | \$759.56 | \$759.56 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$389.06 | \$389.06 |
| Total | \$3,245.10 | \$3,245.10 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|--|------------|-----------------|----------|------------|
| Equipment/Installation | 1223 | Excavation, common earth, large equipment, 150 ft | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yard | \$3.26 | 554.25 | \$1,806.86 |
| Equipment/Installation | 1222 | Excavation, common earth, large equipment, 50 ft | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yard | \$1.37 | 184.75 | \$253.11 |
| Labor | 234 | Supervisor or Manager | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | \$36.52 | 1.00 | \$36.52 |
| Mobilization | 1140 | Mobilization, large equipment | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | \$379.78 | 2.00 | \$759.56 |
| Foregone Income | 1961 | FI, Soybeans Dryland | Dryland Soybeans is Primary Crop | Acre | \$385.53 | 0.50 | \$192.77 |
| Foregone Income | 1959 | FI, Corn Dryland | Dryland Corn is Primary Crop | Acre | \$392.59 | 0.50 | \$196.30 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agricultural Engineering |
| Practice Code/Name | 412 - Grassed Waterway |
| Scenario ID | 4 |
| Scenario Name | <35 foot topwidth with checks |
| Scenario Description | Typical practice is 1 acre, 30' topwidth, 8:1 side slopes, 1.5' depth, half excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. Fabric or stone checks are installed every 100 feet along the length of the waterway perpendicular to waterflow and are 2/3 the waterway top width to reduce maintenance and provide temporary protection until vegetation is established. Fabric Checks are installed 18" deep with 12" laid over on the surface. (Alternatively, rock checks could be installed). This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway. |
| Before Practice Situation | The field has a small gully which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to convey runoff from concentrated flows, terraces, diversions, or water control structures or similar practices to a suitable, stable outlet. |
| After Practice Situation | Installed grassed waterway is 1 acre, 30' topwidth, 8:1 side slopes, 1.5' depth. Fabric checks are installed every 100 feet along the length of the waterway. The practice is installed using a dozer. Fabric or stone checks are installed with small backhoe and labor. Includes Critical Area Planting (342) for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed according to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620). |
| Scenario Feature Measure | Acre of Waterway |
| Scenario Unit | Acre |
| Scenario Typical Size | 1 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$887.04 | \$887.04 |
| Equipment/Installation | \$2,059.96 | \$2,059.96 |
| Labor | \$36.52 | \$36.52 |
| Mobilization | \$872.00 | \$872.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$389.06 | \$389.06 |
| Total | \$4,244.58 | \$4,244.58 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|--|------------|-----------------|----------|------------|
| Materials | 44 | Rock Riprap, Placed with geotextile | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic yard | \$63.36 | 14 | \$887.04 |
| Equipment/Installation | 1223 | Excavation, common earth, large equipment, 150 ft | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yard | \$3.26 | 554.25 | \$1,806.86 |
| Equipment/Installation | 1222 | Excavation, common earth, large equipment, 50 ft | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yard | \$1.37 | 184.75 | \$253.11 |
| Labor | 234 | Supervisor or Manager | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | \$36.52 | 1 | \$36.52 |
| Mobilization | 1140 | Mobilization, large equipment | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | \$379.78 | 2 | \$759.56 |
| Mobilization | 1137 | Mobilization, very small equipment | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | \$56.22 | 2 | \$112.44 |
| Foregone Income | 1961 | FI, Soybeans Dryland | Dryland Soybeans is Primary Crop | Acre | \$385.53 | 0.5 | \$192.77 |
| Foregone Income | 1959 | FI, Corn Dryland | Dryland Corn is Primary Crop | Acre | \$392.59 | 0.5 | \$196.30 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agricultural Engineering |
| Practice Code/Name | 412 - Grassed Waterway |
| Scenario ID | 2 |
| Scenario Name | 35-55 foot topwidth |
| Scenario Description | Typical practice is 1 acre, 45' topwidth, 10:1 side slopes, 1.5' depth, 50% excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway. |
| Before Practice Situation | The field has a small gully which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to convey runoff from concentrated flows, terraces, diversions, or water control structures or similar practices to a suitable, stable outlet. |
| After Practice Situation | Installed grassed waterway is 1 acre, 45' topwidth, 10:1 side slopes, 1.5' depth. The practice is installed using a dozer. Critical Area Planting (342) is included for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed according to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If Inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620). |
| Scenario Feature Measure | Acre of Waterway |
| Scenario Unit | Acre |
| Scenario Typical Size | 1 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$0.00 | \$0.00 |
| Equipment/Installation | \$2,249.51 | \$2,249.51 |
| Labor | \$36.52 | \$36.52 |
| Mobilization | \$759.56 | \$759.56 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$389.06 | \$389.06 |
| Total | \$3,434.65 | \$3,434.65 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|--|------------|-----------------|----------|------------|
| Equipment/Installation | 1223 | Excavation, common earth, large equipment, 150 ft | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yard | \$3.26 | 605.3 | \$1,973.12 |
| Equipment/Installation | 1222 | Excavation, common earth, large equipment, 50 ft | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yard | \$1.37 | 201.8 | \$276.40 |
| Labor | 234 | Supervisor or Manager | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | \$36.52 | 1.00 | \$36.52 |
| Mobilization | 1140 | Mobilization, large equipment | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | \$379.78 | 2.0 | \$759.56 |
| Foregone Income | 1961 | Fl, Soybeans Dryland | Dryland Soybeans is Primary Crop | Acre | \$385.53 | 0.5 | \$192.77 |
| Foregone Income | 1959 | Fl, Corn Dryland | Dryland Corn is Primary Crop | Acre | \$392.59 | 0.5 | \$196.30 |

Scenario Worksheet

Practice and Scenario Description:

| Information Type | Data |
|---------------------------|---|
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agricultural Engineering |
| Practice Code/Name | 412 - Grassed Waterway |
| Scenario ID | 5 |
| Scenario Name | 35-55 foot topwidth with checks |
| Scenario Description | Typical practice is 1 acre, 45' topwidth, 10:1 side slopes, 1.5' depth, half excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. Fabric or stone checks are installed every 100 feet along the length of the waterway perpendicular to waterflow and are 2/3 the waterway top width to reduce maintenance and provide temporary protection until vegetation is established. Fabric Checks are installed 18" deep with 12" laid over on the surface. (Alternatively, rock checks could be installed). This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway. |
| Before Practice Situation | The field has a small gully which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to convey runoff from concentrated flows, terraces, diversions, or water control structures or similar practices to a suitable, stable outlet. |
| After Practice Situation | Installed grassed waterway is 1 acre, 45' topwidth, 10:1 side slopes, 1.5' depth. Fabric checks are installed every 100 feet along the length of the waterway. The practice is installed using a dozer. Fabric or stone checks are installed with small backhoe and labor. Includes Critical Area Planting (342) for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed according to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If Inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620). |
| Scenario Feature Measure | Acre of Waterway |
| Scenario Unit | Acre |
| Scenario Typical Size | 1 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$1,013.76 | \$1,013.76 |
| Equipment/Installation | \$2,249.51 | \$2,249.51 |
| Labor | \$36.52 | \$36.52 |
| Mobilization | \$872.00 | \$872.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$389.06 | \$389.06 |
| Total | \$4,560.85 | \$4,560.85 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|--|------------|-----------------|----------|------------|
| Materials | 44 | Rock Riprap, Placed with geotextile | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic yard | \$63.36 | 16 | \$1,013.76 |
| Equipment/Installation | 1223 | Excavation, common earth, large equipment, 150 ft | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yard | \$3.26 | 605.25 | \$1,973.12 |
| Equipment/Installation | 1222 | Excavation, common earth, large equipment, 50 ft | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yard | \$1.37 | 201.75 | \$276.40 |
| Labor | 234 | Supervisor or Manager | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | \$36.52 | 1 | \$36.52 |
| Mobilization | 1140 | Mobilization, large equipment | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | \$379.78 | 2 | \$759.56 |
| Mobilization | 1137 | Mobilization, very small equipment | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | \$56.22 | 2 | \$112.44 |
| Foregone Income | 1961 | FI, Soybeans Dryland | Dryland Soybeans is Primary Crop | Acre | \$385.53 | 0.5 | \$192.77 |
| Foregone Income | 1959 | FI, Corn Dryland | Dryland Corn is Primary Crop | Acre | \$392.59 | 0.5 | \$196.30 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agricultural Engineering |
| Practice Code/Name | 412 - Grassed Waterway |
| Scenario ID | 3 |
| Scenario Name | >55 foot topwidth |
| Scenario Description | Typical practice is 1 acre, 60' topwidth, 10:1 side slopes, 2.0' depth, 50% excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway. |
| Before Practice Situation | The field has a small gully which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to convey runoff from concentrated flows, terraces, diversions, or water control structures or similar practices to a suitable, stable outlet. |
| After Practice Situation | Installed grassed waterway is 1 acre, 60' topwidth, 10:1 side slopes, 2.0' depth. The practice is installed using a dozer. Critical Area Planting (342) is included for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed according to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If Inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620). |
| Scenario Feature Measure | Acre of Waterway |
| Scenario Unit | Acre |
| Scenario Typical Size | 1 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$0.00 | \$0.00 |
| Equipment/Installation | \$2,999.35 | \$2,999.35 |
| Labor | \$36.52 | \$36.52 |
| Mobilization | \$759.56 | \$759.56 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$389.06 | \$389.06 |
| Total | \$4,184.49 | \$4,184.49 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|--|------------|-----------------|----------|------------|
| Equipment/Installation | 1223 | Excavation, common earth, large equipment, 150 ft | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yard | \$3.26 | 807 | \$2,630.82 |
| Equipment/Installation | 1222 | Excavation, common earth, large equipment, 50 ft | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yard | \$1.37 | 269 | \$368.53 |
| Labor | 234 | Supervisor or Manager | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | \$36.52 | 1.00 | \$36.52 |
| Mobilization | 1140 | Mobilization, large equipment | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | \$379.78 | 2 | \$759.56 |
| Foregone Income | 1961 | FI, Soybeans Dryland | Dryland Soybeans is Primary Crop | Acre | \$385.53 | 0.5 | \$192.77 |
| Foregone Income | 1959 | FI, Corn Dryland | Dryland Corn is Primary Crop | Acre | \$392.59 | 0.5 | \$196.30 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Agricultural Engineering |
| Practice Code/Name | 412 - Grassed Waterway |
| Scenario ID | 6 |
| Scenario Name | >55 foot topwidth with checks |
| Scenario Description | Typical practice is 1 acre, 60' topwidth, 10:1 side slopes, 2.0' depth, half excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. Fabric or stone checks are installed every 100 feet along the length of the waterway perpendicular to waterflow and are 2/3 the waterway top width to reduce maintenance and provide temporary protection until vegetation is established. Fabric Checks are installed 18" deep with 12" laid over on the surface. (Alternatively, rock checks could be installed). This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway. |
| Before Practice Situation | The field has a small gully which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to convey runoff from concentrated flows, terraces, diversions, or water control structures or similar practices to a suitable, stable outlet. |
| After Practice Situation | Installed grassed waterway is 1 acre, 60' topwidth, 10:1 side slopes, 2.0' depth. Fabric checks are installed every 100 feet along the length of the waterway. The practice is installed using a dozer. Fabric or stone checks are installed with small backhoe and labor. Includes Critical Area Planting (342) for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed according to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If Inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620). |
| Scenario Feature Measure | Acre of Waterway |
| Scenario Unit | Acre |
| Scenario Typical Size | 1 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$950.40 | \$950.40 |
| Equipment/Installation | \$2,999.35 | \$2,999.35 |
| Labor | \$36.52 | \$36.52 |
| Mobilization | \$872.00 | \$872.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$389.06 | \$389.06 |
| Total | \$5,247.33 | \$5,247.33 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|--|------------|-----------------|----------|------------|
| Materials | 44 | Rock Riprap, Placed with geotextile | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic yard | \$63.36 | 15 | \$950.40 |
| Equipment/Installation | 1223 | Excavation, common earth, large equipment, 150 ft | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yard | \$3.26 | 807.0 | \$2,630.82 |
| Equipment/Installation | 1222 | Excavation, common earth, large equipment, 50 ft | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yard | \$1.37 | 269.0 | \$368.53 |
| Labor | 234 | Supervisor or Manager | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | \$36.52 | 1 | \$36.52 |
| Mobilization | 1140 | Mobilization, large equipment | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | \$379.78 | 2 | \$759.56 |
| Mobilization | 1137 | Mobilization, very small equipment | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | \$56.22 | 2 | \$112.44 |
| Foregone Income | 1961 | FI, Soybeans Dryland | Dryland Soybeans is Primary Crop | Acre | \$385.53 | 0.5 | \$192.77 |
| Foregone Income | 1959 | FI, Corn Dryland | Dryland Corn is Primary Crop | Acre | \$392.59 | 0.5 | \$196.30 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Wildlife Wetland |
| Practice Code/Name | 422 - Hedgerow Planting |
| Scenario ID | 6 |
| Scenario Name | 1 row hedgerow - bare-root shrub seedling planting stock |
| Scenario Description | One row of bare-root shrubs planted for wildlife habitat (corridor), pollinator habitat, reduction of particulate matter, chemical drift, or odor movement, and boundary delineation and contour guidelines. This practice is typically applied on cropland. Trees and/or shrubs will be planted into previously established bunch grasses that produce erect stems greater than 3' in height and will persist over winter. This herbaceous component will be established according to the guidelines in 327 Conservation Cover. Payment includes materials, labor and equipment needed to machine plant the stock and foregone income for land removed from crop production where hedgerow is installed. Site preparation is not included and must be implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching |
| Before Practice Situation | Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries and mast are limited. |
| After Practice Situation | Inadequate habitat for fish and wildlife is addressed for needs identified in the resource assessment. Habitat patches are connected by dense hedgerow vegetation. Food resources in crop fields are made available by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed. |
| Scenario Feature Measure | length of hedgerow |
| Scenario Unit | Feet |
| Scenario Typical Size | 500 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$85.00 | \$0.17 |
| Equipment/Installation | \$23.66 | \$0.05 |
| Labor | \$19.92 | \$0.04 |
| Mobilization | \$0.00 | \$0.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$89.48 | \$0.18 |
| Total | \$218.06 | \$0.44 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|--|------|-----------------|----------|---------|
| Materials | 1507 | Shrub, seedling or transplant, bare root, 18"-36" | Bare root hardwood trees 18-36" tall. Materials only. | Each | \$0.85 | 100 | \$85.00 |
| Equipment/Installation | 963 | Tractor, agricultural, 60 HP | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | \$19.28 | 1 | \$19.28 |
| Equipment/Installation | 1600 | Mechanical tree planter | Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor. | Hour | \$4.38 | 1 | \$4.38 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 1 | \$19.92 |
| Foregone Income | 1959 | FI, Corn Dryland | Dryland Corn is Primary Crop | Acre | \$392.59 | 0.115 | \$45.15 |
| Foregone Income | 1961 | FI, Soybeans Dryland | Dryland Soybeans is Primary Crop | Acre | \$385.53 | 0.115 | \$44.34 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Wildlife Wetland |
| Practice Code/Name | 422 - Hedgerow Planting |
| Scenario ID | 5 |
| Scenario Name | 1 row hedgerow - bare-root tree seedling planting stock |
| Scenario Description | One row of bare-root trees planted for wildlife habitat (corridor), pollinator habitat, reduction of particulate matter, chemical drift, or odor movement, and boundary delineation and contour guidelines. This practice is typically applied on cropland. Trees and/or shrubs will be planted into previously established bunch grasses that produce erect stems greater than 3' in height and will persist over winter. This herbaceous component will be established according to the guidelines in 327 Conservation Cover. Payment includes materials, labor and equipment needed to machine plant the stock and foregone income for land removed from crop production where hedgerow is installed. Site preparation is not included and must be implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching |
| Before Practice Situation | Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries and mast are limited. |
| After Practice Situation | Inadequate habitat for fish and wildlife is addressed for needs identified in the resource assessment. Habitat patches are connected by dense hedgerow vegetation. Food resources in crop fields are made available by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed. |
| Scenario Feature Measure | length of hedgerow |
| Scenario Unit | Feet |
| Scenario Typical Size | 500 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$40.00 | \$0.08 |
| Equipment/Installation | \$11.83 | \$0.02 |
| Labor | \$9.96 | \$0.02 |
| Mobilization | \$0.00 | \$0.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$89.48 | \$0.18 |
| Total | \$151.27 | \$0.30 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|--|------|-----------------|----------|---------|
| Materials | 1510 | Tree, hardwood, seedling or transplant, bare root, 16-36" | Bare root hardwood trees 18-36" tall. Materials only. | Each | \$0.80 | 50 | \$40.00 |
| Equipment/Installation | 963 | Tractor, agricultural, 60 HP | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | \$19.28 | 0.5 | \$9.64 |
| Equipment/Installation | 1600 | Mechanical tree planter | Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor. | Hour | \$4.38 | 0.5 | \$2.19 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 0.5 | \$9.96 |
| Foregone Income | 1959 | FI, Corn Dryland | Dryland Corn is Primary Crop | Acre | \$392.59 | 0.115 | \$45.15 |
| Foregone Income | 1961 | FI, Soybeans Dryland | Dryland Soybeans is Primary Crop | Acre | \$385.53 | 0.115 | \$44.34 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|---|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Wildlife Wetland |
| Practice Code/Name | 422 - Hedgerow Planting |
| Scenario ID | 3 |
| Scenario Name | 1 row hedgerow - container shrubs planting stock |
| Scenario Description | One row of container shrubs planted for wildlife habitat (corridor), pollinator habitat, reduction of particulate matter, chemical drift, or odor movement, and boundary delineation and contour guidelines. This practice is typically applied on cropland. Trees and/or shrubs will be planted into previously established bunch grasses that produce erect stems greater than 3' in height and will persist over winter. This herbaceous component will be established according to the guidelines in 327 Conservation Cover. Payment includes materials, labor and equipment needed to hand plant the stock and foregone income for land removed from crop production where hedgerow is installed. Site preparation is not included and must be implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching |
| Before Practice Situation | Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries and mast are limited. |
| After Practice Situation | Inadequate habitat for fish and wildlife is addressed for needs identified in the resource assessment. Habitat patches are connected by dense hedgerow vegetation. Food resources in crop fields are made available by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed. |
| Scenario Feature Measure | length of hedgerow |
| Scenario Unit | Feet |
| Scenario Typical Size | 500 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$609.00 | \$1.22 |
| Equipment/Installation | \$56.64 | \$0.11 |
| Labor | \$119.52 | \$0.24 |
| Mobilization | \$0.00 | \$0.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$89.48 | \$0.18 |
| Total | \$874.64 | \$1.75 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|---|--|------|-----------------|----------|----------|
| Materials | 1526 | Shrub, seedling or transplant, potted, 1 gal. | Potted shrub, 1 gal. Materials only. | Each | \$6.09 | 100 | \$609.00 |
| Equipment/Installation | 1590 | Hand tools, tree planting | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. | Hour | \$9.44 | 6 | \$56.64 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 6 | \$119.52 |
| Foregone Income | 1959 | FI, Corn Dryland | Dryland Corn is Primary Crop | Acre | \$392.59 | 0.115 | \$45.15 |
| Foregone Income | 1961 | FI, Soybeans Dryland | Dryland Soybeans is Primary Crop | Acre | \$385.53 | 0.115 | \$44.34 |

Scenario Worksheet

Practice and Scenario Description:

| | |
|---------------------------|--|
| Information Type | Data |
| Region | Corn Belt |
| State | Ohio |
| Discipline Group | Wildlife Wetland |
| Practice Code/Name | 422 - Hedgerow Planting |
| Scenario ID | 2 |
| Scenario Name | 1 row hedgerow - container trees planting stock |
| Scenario Description | One row of container trees planted for wildlife habitat (corridor), pollinator habitat, reduction of particulate matter, chemical drift, or odor movement, and boundary delineation and contour guidelines. This practice is typically applied on cropland. Trees and/or shrubs will be planted into previously established bunch grasses that produce erect stems greater than 3' in height and will persist over winter. This herbaceous component will be established according to the guidelines in 327 Conservation Cover. Payment includes materials, labor and equipment needed to hand plant the stock and foregone income for land removed from crop production where hedgerow is installed. Site preparation is not included and must be implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching |
| Before Practice Situation | Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries and mast are limited. |
| After Practice Situation | Inadequate habitat for fish and wildlife is addressed for needs identified in the resource assessment. Habitat patches are connected by dense hedgerow vegetation. Food resources in crop fields are made available by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed. |
| Scenario Feature Measure | length of hedgerow |
| Scenario Unit | Feet |
| Scenario Typical Size | 500 |

Cost Summary:

| Cost Category | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials | \$334.00 | \$0.67 |
| Equipment/Installation | \$28.32 | \$0.06 |
| Labor | \$59.76 | \$0.12 |
| Mobilization | \$0.00 | \$0.00 |
| Acquisition of Technical Knowledge | \$0.00 | \$0.00 |
| Foregone Income | \$89.48 | \$0.18 |
| Total | \$511.56 | \$1.02 |

Cost Details:

| Cost Category | Component ID | Component Name | Component Description | Unit | Price (\$/unit) | Quantity | Cost |
|------------------------|--------------|--|--|------|-----------------|----------|----------|
| Materials | 1531 | Tree, hardwood, seedling or transplant, potted, 1 gal. | Potted hardwood tree, 1 gal. Materials only. | Each | \$6.68 | 50 | \$334.00 |
| Equipment/Installation | 1590 | Hand tools, tree planting | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. | Hour | \$9.44 | 3 | \$28.32 |
| Labor | 231 | General Labor | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$19.92 | 3 | \$59.76 |
| Foregone Income | 1959 | FI, Corn Dryland | Dryland Corn is Primary Crop | Acre | \$392.59 | 0.115 | \$45.15 |
| Foregone Income | 1961 | FI, Soybeans Dryland | Dryland Soybeans is Primary Crop | Acre | \$385.53 | 0.115 | \$44.34 |