Practice: 512 - Forage and Biomass Planting

Scenario: #1 - Native warm season grass

Scenario Description: Establish or reseed adapted perennial native grasses to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of native grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation: Poorly managed/degraded pasture land or cropland being converted to pasture and/or hay.

After Situation: Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

Scenario Feature Measure: Acres of Forgage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 30

Total Scenario Cost: $7,576.28

Scenario Cost/Unit: $252.54

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.93	30	$477.79
Herbicide, Imazapic	335	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$12.86	30	$385.91
One Species, Warm Season, Native Perennial Grass	2322	Native, warm season perennial grass. Includes material and shipping only.	Acre	$70.93	30	$2,127.79
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.13	1	$10.13
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.19	30	$185.83
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.94	30	$208.15
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$10.55	30	$316.37
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.56	30	$646.94
Foregone Income						
FI, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	$42.90	75	$3,217.36

Practice: 512 - Forage and Biomass Planting

Scenario: #2 - Native warm season grass, mined land

Scenario Description: Establish or reseed adapted perennial native grasses to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of native grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation: Reclaimed mine land with low pH. Poorly managed/degraded pasture land or cropland being converted to pasture and/or hay.

After Situation: Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

Scenario Feature Measure: Acres of Forgage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 30

Total Scenario Cost: $14,842.81

Scenario Cost/Unit: $494.76

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.93	30	$477.79
Herbicide, Imazapic	335	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$12.86	30	$385.91
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$121.11	60	$7,266.53
One Species, Warm Season, Native Perennial Grass	2322	Native, warm season perennial grass. Includes material and shipping only.	Acre	$70.93	30	$2,127.79
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.13	1	$10.13
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.19	30	$185.83
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.94	30	$208.15
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$10.55	30	$316.37
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.56	30	$646.94
Foregone Income						
FI, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	$42.90	75	$3,217.36

Practice: 512 - Forage and Biomass Planting

Scenario: #3 - Native warm season grass mix

Scenario Description: Establish or reseed adapted perennial native warm season grasses to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial native warm season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation: Existing stand of perennial grasses or monoculture or no grasses present. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation: Suitable NWSG species are established to improve forage quality and quantity and reduce soil erosion on cropland, hayland, pasture and/or biomass production.

Scenario Feature Measure: Acres of Forgage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 30

Total Scenario Cost: $11,821.21

Scenario Cost/Unit: $394.04

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.93	30	$477.79
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.13	1	$10.13
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	$220.98	30	$6,629.25
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.19	30	$185.83
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$10.55	30	$316.37
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.56	30	$646.94
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$11.25	30	$337.54
Foregone Income						
FI, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	$42.90	75	$3,217.36

Practice: 512 - Forage and Biomass Planting

Scenario: #4 - Native warm season grass mix, mined land

Scenario Description: Establish or reseed adapted perennial native warm season grasses to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial native warm season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation: Reclaimed mine land with low pH. Existing stand of perennial grasses or monoculture or no grasses present. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation: Suitable NWSG species are established to improve forage quality and quantity and reduce soil erosion on cropland, hayland, pasture and/or biomass production.

Scenario Feature Measure: Acres of Forgage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 30

Total Scenario Cost: $19,087.74

Scenario Cost/Unit: $636.26

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.93	30	$477.79
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$121.11	60	$7,266.53
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.13	1	$10.13
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	$220.98	30	$6,629.25
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.19	30	$185.83
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$10.55	30	$316.37
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.56	30	$646.94
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$11.25	30	$337.54
Foregone Income						
FI, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	$42.90	75	$3,217.36

Practice: 512 - Forage and Biomass Planting

Scenario: #5 - Cool season grass and legume forage

Scenario Description: Establish adapted perennial introduced cool season grasses and legumes to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial introduced cool season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation: Poor or nonexistent stand of grass species. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation: Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

Scenario Feature Measure: Acres of Forgage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 30

Total Scenario Cost: $13,502.91

Scenario Cost/Unit: $450.10

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.93	30	$477.79
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$121.11	60	$7,266.53
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.85	1200	$1,014.28
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.66	1500	$988.95
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.50	1500	$743.64
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.13	1	$10.13
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$54.10	30	$1,623.11
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.19	30	$185.83
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.94	30	$208.15
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.56	30	$646.94
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$11.25	30	$337.54

Practice: 512 - Forage and Biomass Planting

Scenario: #6 - Warm season, introduced forage

Scenario Description: Establish or reseed adapted introduced warm season grasses to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial introduced warm season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation: Existing stand of perennial grasses or monoculture or no grasses present. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation: Suitable species are established to improve forage quality and quantity and reduce soil erosionon cropland ,hayland, pasture, and/or biomass production.

Scenario Feature Measure: Acres of Forgage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 30

Total Scenario Cost: $13,802.39

Scenario Cost/Unit: $460.08

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.93	30	$477.79
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$121.11	60	$7,266.53
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.85	1200	$1,014.28
One Species, Warm Season, Introduced Perennial Grass (seed or sprigs)	2323	Introduced, warm season perennial grass seed or sprig. Includes material and shipping only.	Acre	$64.09	30	$1,922.59
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.66	1500	$988.95
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.50	1500	$743.64
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.13	1	$10.13
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.19	30	$185.83
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.94	30	$208.15
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.56	30	$646.94
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$11.25	30	$337.54

Practice: 512 - Forage and Biomass Planting

Scenario: #7 - Overseeding Legumes

Scenario Description: Establishment of legumes for the purpose of increasing plant diversity, soil quality and fertility, and plant health and enhancing the quality of forage. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation: Existing stand of perennial grasses or monoculture with no legumes present .

After Situation: Legumes will be maintained through proper grazing management and improve plant diversity and soil quality.

Scenario Feature Measure: Acres of Forgage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 30

Total Scenario Cost: $11,269.19

Scenario Cost/Unit: $375.64

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
Materials						
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$121.11	60	$7,266.53
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.66	1500	$988.95
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.50	1500	$743.64
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$54.10	30	$1,623.11
Equipment Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.56	30	$646.94

Practice: 512 - Forage and Biomass Planting

Scenario: #8 - Overseeding Legumes-No Fertilizer

Scenario Description: Establishment of legumes for the purpose of increasing plant diversity, soil quality and fertility, and plant health and enhancing the quality of forage. This practice may be utilized for organic or regular production. This scenario assumes, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation: Existing stand of perennial grasses or monoculture with no legumes present .

After Situation: Legumes will be maintained through proper grazing management and improve plant diversity and soil quality.

Scenario Feature Measure: Acres of Forgage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 30

Total Scenario Cost: $2,270.06

Scenario Cost/Unit: $75.67

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
Equipment Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.56	30	$646.94
Materials						
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$54.10	30	$1,623.11

Practice: 512 - Forage and Biomass Planting

Scenario: #9 - Frost-Seeding Legumes

Scenario Description: Establishment of legumes for the purpose of increasing plant diversity, soil quality and fertility and plant health and enhancing the quality of forage. Consider frost seeding legumes on soils with adequate soil pH (>6.0)and good fertility. Site preparation is achieved by grazing livestock. This scenario assumes seed, equipment and labor for seeding. This practice may be utilized for organic or regular production.

Before Situation: Existing stand of perennial grasses or monoculture with no legumes present.

After Situation: Legumes will be established and maintained through proper grazing management and will improve plant diversity and soil quality.

Scenario Feature Measure: Acres of Forgage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: $3,672.74

Scenario Cost/Unit: $367.27

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
Materials						
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$121.11	20	$2,422.18
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.66	500	$329.65
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.50	500	$247.88
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$54.10	10	$541.04
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$33.00	4	$131.99

Practice: 512 - Forage and Biomass Planting

Scenario: #10 - Frost-Seeding Legumes-No Fertilizer

Scenario Description: Establishment of legumes for the purpose of increasing plant diversity, soil quality and fertility and plant health and enhancing the quality of forage. Consider frost seeding legumes on soils with adequate soil pH (>6.0)and good fertility. Site preparation is achieved by grazing livestock. This scenario assumes seed, equipment and labor for seeding. This practice may be utilized for organic or regular production.

Before Situation: Existing stand of perennial grasses or monoculture with no legumes present.

After Situation: Legumes will be established and maintained through proper grazing management and will improve plant diversity and soil quality.

Scenario Feature Measure: Acres of Forgage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: $673.03

Scenario Cost/Unit: $67.30

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$33.00	4	$131.99
Materials						
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$54.10	10	$541.04

Practice: 512 - Forage and Biomass Planting

Scenario: #11 - Annuals in conversion to desireable cool season grass-legume mix

Scenario Description: Convert from a degraded toxic endophyte infected sod and establish a preferred, perennial cool season, grass- legume mix to improve forage quality or quantity to meet the nutritional needs and production goals of livestock, and promote soil health. The conversion will include a minimum, one-year double-crop, grazed annual mix, to smother the competition in combination with targeted burndown herbicide applications to kill the existing sod and escaped undesirable plants. Used for no-till seeding of annual and perennial grasses and legumes for pasture and hayland. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding and spreading. The practice is not complete until the perennial is established.

Before Situation: Existing stand of degraded perennial grass legume mix or monoculture or no grasses present. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation: Suitable perennial cool season grass-legume species mix is established to improve forage quality and quantity and reduce soil erosionon on pasture or hayland.

Scenario Feature Measure: Acres of Forgage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 30

Total Scenario Cost: $15,952.43

Scenario Cost/Unit: $531.75

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
Materials						
Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	$49.65	30	$1,489.39
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.93	30	$477.79
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.93	30	$477.79
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$121.11	60	$7,266.53
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.66	1500	$988.95
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.50	1500	$743.64
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.13	1	$10.13
Three Species Mix, Warm Season, Annual Grasses and Legumes	2326	Warm season annual grass and legume mix. Includes material and shipping only.	Acre	$61.14	30	$1,834.17
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$54.10	30	$1,623.11
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.19	30	$185.83
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.94	30	$208.15
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.56	30	$646.94

Practice: 512 - Forage and Biomass Planting

Scenario: #12 - Annuals in conversion to NWSG Mix

Scenario Description: Convert from a degraded, mixed grass pasture to establish to a native warm season grass mix to improve forage quality or quantity, to improve or maintain livestock/wildlife nutrition and health, extend the length of forage production and grazing season in combination with grazing managment, provide soil cover to reduce erosion and promote soil health. The conversion will include a minimum, one-year double-crop annual mix, to smother the competition, in combination with multiple targeted burndown herbicide applications to kill the existing sod and escaped plants between seasons. Used for no-till seeding of annual and perennial grasses and/or legumes for pasture, hayland, and wildlife openings. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding and spreading. This practice is not complete until the perennial is established.

Before Situation: Existing stand of degraded perennial grasses or monoculture or no grasses present. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation: Suitable native warm season perennial plant mixture is established to improve forage quality and quantity and reduce soil erosion on cropland , hayland, pasture, and/or biomass production

Scenario Feature Measure: Acres of Forgage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 30

Total Scenario Cost: $15,726.43

Scenario Cost/Unit: $524.21

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.93	30	$477.79
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.93	30	$477.79
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$121.11	30	$3,633.27
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.13	1	$10.13
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	$220.98	30	$6,629.25
Three Species Mix, Warm Season, Annual Grasses and Legumes	2326	Warm season annual grass and legume mix. Includes material and shipping only.	Acre	$61.14	30	$1,834.17
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$54.10	30	$1,623.11
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.19	30	$185.83
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.94	30	$208.15
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.56	30	$646.94

Practice: 512 - Forage and Biomass Planting

Scenario: #52 - Organic fescue conversion to NWSGs

Scenario Description: Organic farm situation most typical: an existing stand of fescue that will be smothered/suppressed using tillage and a summer annual mixture (multi-species, multi-functional group cover crop mix) followed by a winter annual mix. Tillage alone is not as successful as tillage plus smother crops and spraying is not permitted in organic operations. This cover serves to prepare for a desired end state when a native warm season grass mixture is established the following late spring/early summer. This scenario assumes that all seed will be planted with a drill. The existing fescue sod will be setback initially using tillage followed by drilling summer annuals. The summer annuals should be allowed to generate as much biomass as possible, without delaying planting of the following ground cover. The summer annual species will be terminated or removed through mechanical means prior to planting the winter annual mix. The winter annuals will be terminated or removed using mechancial weed control/vegetation termination prior to planting the subsequent NWSG mixture. Establishment of NWSG mixture/alternative to fescue, is for the purpose of increasing plant diversity, soil quality and fertility and plant health and enhancing the quality of forage. Initial site preparation (before tillage) may be achieved by grazing livestock. This scenario assumes seed, equipment and labor for seeding. This practice may be utilized for organic or non-organic production. This practice is not complete until the perennial is established.

Before Situation: An existing stand of degraded fescue provides low biodiversity, poor soil health, poor wildlife habitat, poor quality and limited quantity forage and diminishing erosion control functions.

After Situation: Field planted with two multispecies, multi-function annual mixes after primary tillage to set fescue back. The average field size is 10 acres. The annuals are seeded with a drill. No additional fertilizer is applied. The summer annuals provide soil erosion conctrol cover by early summer; the winter annuals provide soil erosion control cover by late fall, throughout the winter, and into the early spring. The summer annuals are terminated using mechanical termination; the winter annuals are terminated with mechancial weed control/vegetation termination prior to late spring/early summer planting of subsequent NWSG ground cover timed to maximize the smother effect on original fescue stand.

Scenario Feature Measure: Acres of Forgage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: $4,958.50

Scenario Cost/Unit: $495.85

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
Materials						
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	$220.98	10	$2,209.75
Three Species Mix, Warm Season, Annual Grasses and Legumes	2326	Warm season annual grass and legume mix. Includes material and shipping only.	Acre	$61.14	10	$611.39
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$54.10	10	$541.04
Equipment Installation						
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$8.48	30	$254.44
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acre	$20.74	20	$414.77
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.56	30	$646.94
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$11.25	10	$112.51
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$16.77	10	$167.66

Practice: 512 - Forage and Biomass Planting

Scenario: #53 - Endophyte infect fescue conversion to native warm season grass mixture

Scenario Description: Convert existing stand of endophyte-infected fescue stand to NWSGs to improve livestock nutrition and health and improve wildlife habitat values of the site. Used for either conventional or no-till seeding of perennial native warm season grasses for pasture, hayland, and wildlife openings.

Before Situation: Existing stand of endophyte-infected fescue grass provides poor nutrition to grazing livestock; poor wildlife habitat also. Resource concerns include undesireable forage quality and livestock health; may also include soil erosion and soil quality concerns.

After Situation: Suitable NWSG species are established to improve forage quality, livestock nutrition and health as well as wildlife habitat. May also reduce soil erosion on cropland, hayland, pasture and/or biomass production.

Scenario Feature Measure: Acres of Forgage and Biomass Planted

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: $4,192.74

Scenario Cost/Unit: $419.27

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.93	20	$318.52
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	$220.98	10	$2,209.75
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.19	20	$123.89
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$8.48	10	$84.81
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.56	10	$215.65
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$16.77	10	$167.66
Foregone Income						
FI, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	$42.90	25	$1,072.45

Practice: 512 - Forage and Biomass Planting

Scenario: #54 - Chemical free fescue conversion to cool season grass and legume mixture

Scenario Description: Organic farm situation most typical: an existing stand of fescue that will be smothered/suppressed using tillage and a summer annual mixture (multi-species, multi-functional group cover crop mix) followed by a winter annual mix. Tillage alone is not as successful as tillage plus smother crops and spraying is not permitted in organic operations. This cover serves to prepare for a desired end state when a cool season grass/legume mixture is established the following spring. This scenario assumes that all seed will be planted with a drill. The existing fescue sod will be setback initially using tillage followed by drilling summer annuals. The summer annuals should be allowed to generate as much biomass as possible, without delaying planting of the following ground cover. The summer annual species will be terminated or removed through mechanical means prior to planting the winter annual mix. The winter annuals will be terminated or removed using mechanical weed control/vegetation termination prior to planting the subsequent cool season grass and legume mixture. Establishment of cool season alternatives to fescue is for the purpose of increasing plant diversity, soil quality and fertility and plant health and enhancing the quality of forage. Initial site preparation (before tillage) may be achieved by grazing livestock. This scenario assumes seed, equipment and labor for seeding. This practice may be utilized for organic or non-organic production. This practice is not complete until the perennial is established.

Before Situation: An existing stand of degraded fescue provides low biodiversity, poor soil health, poor wildlife habitat, poor quality and limited quantity forage and diminishing erosion control functions.

After Situation: Field planted with two multispecies, multi-function annual mixes after primary tillage to set fescue back. The average field size is 10 acres. The annuals are seeded with a drill. No additional fertilizer is applied. The summer annuals provide soil erosion control cover by early summer; the winter annuals provide soil erosion control cover by late fall, throughout the winter, and into the early spring. The summer annuals are terminated using mechanical termination; the winter annuals are terminated with mechanical weed control/vegetation termination prior to spring planting of subsequent ground cover timed to maximize the smother effect on the original fescue stand.

Scenario Feature Measure: Acres of Forage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: $3,160.40

Scenario Cost/Unit: $316.04

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
Equipment Installation						
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$8.48	20	$169.63
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acre	$20.74	20	$414.77
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.56	30	$646.94
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$11.25	10	$112.51
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$16.77	10	$167.66
Materials						
Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	$49.65	10	$496.46
Three Species Mix, Warm Season, Annual Grasses and Legumes	2326	Warm season annual grass and legume mix. Includes material and shipping only.	Acre	$61.14	10	$611.39
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$54.10	10	$541.04

Practice: 512 - Forage and Biomass Planting

Scenario: #55 - Endophyte-infected fescue conversion to cool season grass and legume mixture

Scenario Description: Establish novel endophyte or non-endophyte infected fescue, orchard grass and a legume mix to improve livestock nutrition and health and improve wildlife habitat values of the site. Used for either conventional or no-till seeding of perennial cool season grasses and legumes for pasture or hayland. pH assumed to need balancing with lime, but no added nutrients needed typical for this scenario;

Before Situation: Existing stand of endophyte-infected fescue grass provides poor nutrition to grazing livestock; poor wildlife habitat also. Resource concerns include undesirable forage quality and livestock health; may also include soil erosion and soil quality concerns.

After Situation: Cool season grass and legume mixture established to improve livestock nutrition and health as well as improved ground cover, erosion control, and wildlife habitat.

Scenario Feature Measure: Acres of Forage and Biomass Planted

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: $2,168.19

Scenario Cost/Unit: $216.82

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
Materials						
Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2319	Cool season, introduced grass and legume mix. Includes material and shipping only.	Acre	$21.41	10	$214.14
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.93	10	$159.26
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$121.11	10	$1,211.09
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.13	1	$10.13
Equipment Installation						
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$8.48	10	$84.81
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$10.55	10	$105.46
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.56	10	$215.65
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$16.77	10	$167.66