Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario #1 - Competition Control

Scenario Description:

Reduce competition from herbaceous vegetation around trees/shrubs within a windbreak/shelterbelt. Apply appropriate herbicide to kill competing herbaceous vegetation between and/or within tree/shrub rows. A herbicide application is completed to significantly reduce competition from grass in the windbreak.

Before Situation:

Herbaceous competition is inhibiting the growth of desirable trees and shrubs withing the windbreak (sod bound). Resource concerns: Degraded plant condition - undesirable plant productivity and health; livestock production-inadequate livestock shelter..

After Situation:

The Integrity of the windbreak is restored by controlling herbaceous competition through a herbicide application.

Feature Measure: Length of Renovation

Scenario Unit:: Foot

Scenario Typical Size: 1000

Total Scenario Cost: $261.13

Scenario Cost/Unit: $0.26

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$5.07	1.5	$7.61
Labor						
General Labor	231	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	$19.35	4	$77.40
Materials						
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$22.61	1.5	$33.92
Mobilization						
Mobilization, small equipment	1138	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	$142.21	1	$142.21

Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario #2 - Thinning

Scenario Description:

Windbreak is thinned by hand w/chainsaw and cut stumps have herbicide applied to prevent undesirable sprouting.

Before Situation:

The functionality of a 1000 ft, four row windbreak has decreased due to excessive competition from the existing trees and shrubs. Resource concern is degraded plant condition- undesirable plant productivity and health.

After Situation:

The integrety of the windbreak is restored and the function and health improved from thinning the tree/shrub competition using the stump/cut method.

Feature Measure: Length of Renovation

Scenario Unit:: Foot

Scenario Typical Size: 1000

Total Scenario Cost: $644.62

Scenario Cost/Unit: $0.64

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$3.61	8	$28.88
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$49.13	4	$196.52
Labor						
General Labor	231	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	$19.35	8	$154.80
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$102.60	2	$205.20
Materials						
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	1.4	$59.22

Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario #3 - Pruning

Scenario Description:

Windbreak is pruned by hand (hand tools + chainsaw) to improve shape and form of trees and/or shrubs so that the overall effectiveness of the windbreak will improve. Slash is treated to prevent potential insect, disease, fire and operability problems.

Before Situation:

The windbreak tree and or shrub species have become to 'leggy' (grown to tall) or are growing beyond the bounds of the designated windbreak area. Overall density of windbreak is lower than desired optimum. Resource concern is degraded plant condition- undesirable plant productivity and health; Livestock production-inadequate livestock shelter.

After Situation:

The integrity of windbreak has been restored and the impacts of wind reduced by pruning the existing windbreak.

Feature Measure: Length of Renovation

Scenario Unit:: Foot

Scenario Typical Size: 1000

Total Scenario Cost: $651.60

Scenario Cost/Unit: $0.65

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$3.61	16	$57.76
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hour	$4.94	16	$79.04
Labor						
General Labor	231	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	$19.35	16	$309.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$102.60	2	$205.20

Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario #4 - Tree/Shrub Removal with Chain Saw

Scenario Description:

Windbreak renovation requires the removal of degraded or inappropriate trees or shrubs within a windbreak. This may include removal of entire rows, or selected trees/shrubs with a chain saw, in order to prepare for the necessary planting of a replacement row within the windbreak, improve the health of the remaining rows, and/or allow for supplemental planting to expand the windbreak.

Before Situation:

Plant (trees and/or shrubs) health has degraded decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches, gaps of no live green material and some are completley dead. Wind now moves freely through areas that lack any leaves. Resource concerns: Degraded plant condition- undesirable plant productivity and health; livestock production-inadequate livestock shelter, soil erosion-wind.

After Situation:

The integrity and function of windbreak has been restored by removing larger (greater than 8' DBH) with a chain saw. Remaining trees and shrubs will restore foliage and limbs, allowing the windbreak to become effective again.

Feature Measure: Length of Renovation

Scenario Unit:: Foot

Scenario Typical Size: 1000

Total Scenario Cost: $582.44

Scenario Cost/Unit: $0.58

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$3.61	16	$57.76
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hour	$4.94	2	$9.88
Labor						
General Labor	231	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	$19.35	16	$309.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$102.60	2	$205.20

Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario #5 - Removal <8 inches DBH with Skidsteer

Scenario Description:

Windbreak renovation requires the removal of degraded or inappropriate trees or shrubs within a windbreak. This scenario includes removal of entire rows, including stumps or roots, or selected trees/shrubs with average DBH <8 inches. Heavy equipment such as a skidsteer with a sheer or saw is used to remove selected trees/shrubs, in order to prepare for the necessary planting of a replacement row within the windbreak, improve the health of the remaining rows, and/or allow for supplemental planting to expand the windbreak. All slash material from cutting and pruning is either scattered and crushed, piled and crushed, chipped or removed from the treatment area.

Before Situation:

Plant (trees and/or shrubs) health has degraded decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches, gaps of no live green material and some are completley dead. Wind now moves freely through areas that lack any leaves. Resource concerns include degraded plant condition-undesirable plant productivity and health; livestock production-inadequate livestock shelter, soil erosion-wind.

After Situation:

The integrity and function of windbreak has been restored by removing smaller (less than 8' DBH) degraded and inappropriate trees in an existing windbreak using a machine, such as a skid steer. Remaining tree and shrubs will thrive.

Feature Measure: Length of Renovation

Scenario Unit:: Foot

Scenario Typical Size: 1000

Total Scenario Cost: $1,138.26

Scenario Cost/Unit: $1.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$36.86	8	$294.88
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.53	10	$215.30
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$102.60	2	$205.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$211.44	2	$422.88

Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario #6 - Removal > 8 inches DBH with Dozer

Scenario Description:

Windbreak renovation requires the removal of degraded or inappropriate trees or shrubs within a windbreak. This scenario includes removal of entire rows, including stumps or roots, or selected trees/shrubs with average DBH >8 inches in order to prepare for the necessary planting of a replacement rows within the windbreak, improve the health of the remaining rows, and/or allow for supplemental planting to expand the windbreak. Typically trees and shrubs are cleared by dozer (D-6 or equivalent) using a brush rake or blade. All slash material from cutting and pruning is either scattered and crushed, piled and crushed, chipped or removed from the treatment area.

Before Situation:

Plant (trees and/or shrubs) health has degraded decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches, gaps of no live green material and some are completley dead. Wind now moves freely through areas that lack any leaves. Resource concerns include degraded plant condition-undesirable plant productivity and health; livestock production-inadequate livestock shelter, soil erosion-wind.

After Situation:

Integrity and function of the windbreak has been restored after removal of degraded trees/shrubs that are larger than 8' DBH using a small dozer, excavator or other equipment.

Feature Measure: Length of Renovation

Scenario Unit:: Foot

Scenario Typical Size: 1000

Total Scenario Cost: $1,681.00

Scenario Cost/Unit: $1.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$102.51	10	$1,025.10
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$25.22	10	$252.20
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$403.70	1	$403.70

Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario #7 - Supplemental Planting-Containerized Seedlings

Scenario Description:

Parts of the windbreak being renovated have died. Supplemental plantings of large containerized (2-3 gallons) trees/shrubs will improve the effectiveness and longevity of the windbreak. Planting is achieved through hand planting.

Before Situation:

Mortality of woody plants has resulted in openings in the windbreak, inhibiting windbreak effectiveness. Resource concerns include soil erosion - wind erosion, degraded plant condition -Inadequate structure and composition, and livestock production limitation - inadequate livestock shelter.

After Situation:

The integrity and function of the windbreak is restored. The windbreak/shelterbelt is expanded through the hand- planting of containerized tree and shrub seedlings.

Feature Measure: Number of trees planted

Scenario Unit:: Each

Scenario Typical Size: 50

Total Scenario Cost: $800.21

Scenario Cost/Unit: $16.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$18.01	3	$54.03
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$12.04	12	$144.48
Labor						
General Labor	231	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	$19.35	12	$232.20
Materials						
Tree, conifer, seedling or transplant, potted or B&B, 2-3 gal.	1537	Potted or balled and burlapped conifer tree, 2-3 gal. Includes materials and shipping only.	Each	$7.39	50	$369.50

Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario #8 - Supplemental Plantings-Bare Root

Scenario Description:

Parts of the windbreak being renovated have died. Supplemental plantings of bare root trees/shrubs will improve the effectiveness and longevity of the windbreak. Planting is achieved through hand planting.

Before Situation:

Dead trees/shrubs are inhibiting windbreak effectiveness. Resource concerns include soil erosion - wind erosion, degraded plant condition - Inadequate structure and composition, and livestock production limitation - inadequate livestock shelter.

After Situation:

The integrity and function of the windbreak is restored. The windbreak/shelterbelt is expanded through the hand- planting of bare root tree and shrub seedlings.

Feature Measure: Per tree

Scenario Unit:: Each

Scenario Typical Size: 50

Total Scenario Cost: $58.07

Scenario Cost/Unit: $1.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$18.01	0.3	$5.40
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$12.04	1.2	$14.45
Labor						
General Labor	231	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	$19.35	1.2	$23.22
Materials						
Tree, hardwood, seedling or transplant, bare root, 6-18"	1509	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	$0.30	50	$15.00

Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario #9 - Coppicing

Scenario Description:

Windbreak renovation is accomplished by cutting of selected trees and understory vegetation to promote coppicing to ensure that species composition and stand structure continue to serve their intended purpose. Woody debris will be removed from the windbreak.

Before Situation:

Tree and shrub health has degraded decreasing the effectiveness of the original windbreak design. Trees lack leaf cover, have dead branches, gaps of no live green material and some are completley dead. Wind now moves freely through areas that lack any leaves. Resource concern is degraded plant condition- undesirable plant productivity and health.

After Situation:

The integrity and function of the windbreak is restored after the windbreak is renovated by coppicing existing woody plants.

Feature Measure: Area of Renovation

Scenario Unit:: Acre

Scenario Typical Size: 1

Total Scenario Cost: $547.60

Scenario Cost/Unit: $547.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$36.86	4	$147.44
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.53	4	$86.12
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$102.60	1	$102.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$211.44	1	$211.44