



Tree and Shrub Establishment

Direct Seeding Job Sheet

(JS-MO612ds)

Missouri - Natural Resources Conservation Service

December 2013

Landowner:		Farm #:
Field(s):	Acres:	Acres:
Soil Map Unit(s):		County:
Designed By:		Approved By:
		Signature:
Date:		Date:

DEFINITION

Establishing woody plants by direct seeding of tree and/or shrub seeds.

PURPOSES (check all that apply)

- Establish woody plants for forest products
- Establish wood plants for wildlife habitat
- Long-term erosion control
- Improvement of water quality
- Treat waste
- Reduction of air pollution
- Storing carbon in biomass
- Reduce energy use
- Develop renewable energy sources
- Improve or restore natural diversity
- Control snow deposition
- Enhance aesthetics
- Control airborne chemical drift and odor movement



Machine planting woody seed is a direct seeding method that provides excellent soil-seed contact.

CONDITION WHERE PRACTICE APPLIES

Direct seeding for planting may be used under any of the following conditions:

- In open areas
- In under-stocked woodlands.
- On areas where the site can be prepared.
- Where measures for protecting seed and germinating seedlings can be provided.

SPECIFICATIONS

Site Preparation

Any vegetation that would hinder planting or provide excessive competition to the seeding should be removed with appropriate treatment. Base site preparation activities on anticipated direct seeding method and seed predation pressures. For spring seeding, begin site preparation in the fall with a spring follow up. For fall seeding, begin site preparation in mid-summer with an additional early fall follow up. *If high seed predation is expected, seed predator numbers and/or habitat should be reduced.* Prior to seeding, adequate protection from fire and livestock should be established.

Site preparation is planned as follows (check all that apply):

- Mechanical means such as plowing, disking or roto-tilling
- Chemical control of vegetation
- Prescribed burning based on a current approved prescribed burn plan
- Other:

If a *cover crop* is needed, use the following species at the indicated rates:

Field	Temporary/Permanent	Species	Rate – PLS/ac

If *chemical weed control* is needed, use the following products at label rates:

Field	Herbicide	Treatment Area: field/strip/spot

Existing shrubs or trees may be maintained if the site is to be inter-planted and the retained plants will provide functions consistent with the planned use. For wildlife purposes, consider retaining some trees and shrubs that will provide den sites or mast production while the new planting is becoming established. Undesirable plants that will hamper planting or provide excessive shade should be removed or killed.

The following trees and shrubs will be maintained between inter-seeded areas:

Field	Species	Species

SEED COLLECTION

If seeds are field collected, place seeds in porous bags to prevent heat buildup. Keep seeds cool and stratify if necessary. Careful observation of seed fall and the amount of seed visible on the trees before seed fall will help in deciding when to collect seed. Use the following table to help manage seed collection for selected species. Tree specie per acre rates are based on 1500 seeds per acre for drilling or hand planting at and 3000 seeds/ac for a broadcasting method. Shrub specie rates are double the tree rate.

	Wild Plum	Black Walnut	Pecan	White Oak Group	Red Oak Group
Seed Maturity	June-October	September-October	September-October	October - November	October - November
Seed Dispersal	Immediately after ripening. Gravity, animal, and water dissemination.	Immediately after ripening. Gravity, animal, and water dissemination.	Immediately after ripening. Gravity, animal, and water dissemination.	Fall and early winter. Gravity, animal, and water dissemination.	Fall and early winter. Gravity, animal, and water dissemination.
Good Seed Years	Every 1 -2 years	Every 1 -2 years	Every 1 -2 years	Every 3-5 years	Every 1-3 years
Germination	Spring following summer/fall seed dispersal.	Spring following fall seed dispersal.	Spring following fall seed dispersal.	Immediately following seed dispersal.	Spring following fall seed dispersal.
Prechilling	90-150 days	90-120 days	90 days	None required	30-60 days
Clean Seeds/LB	850 seeds	50 seeds	100 seeds	Bur Oak - 60 White Oak = 90 Swamp WO = 120	Red Oak = 125 Black Oak = 250 Pin Oak = 420
LBS/Ac Rate	3.5 lbs	30 lbs	15 lbs	BrO-25 lbs; WO-16.7lbs; SWO-12.5lbs	RO-12 lbs; BO-6 lbs; PO-3.6 lbs

SEEDING METHODS AND RATES

Tree/shrub seed may be planted anytime from November through April that soil and site conditions allow (Do not seed into frozen soil. Good soil moisture should be present in upper 10 inches before planting.). Non-stratified seed should be planted before January 1. Spring seeding can reduce rodent and insect damage. Fall seeding can eliminate the need for stratification. Acorns of most species in the white oak group have little or no dormancy and should be planted as soon as possible after collection in the fall. Keep seed in sealed plastic bags in refrigerated storage (at about 40 degrees F) until ready to plant. Inspect seed before planting. Care must be taken to completely cover the seed and achieve good soil-seed contact. Use the deeper planting depths for larger seeds, herbicide pretreatments, if seed predation pressure is anticipated, or if surface soil moisture is limiting.

One or more of the following seeding methods should be used:

- Broadcast*: Broadcast the seed evenly over the planting area and cover seeds with mineral soil (1-2 inches). Roll the planted area to assure good soil-seed contact.
- Strip*: Broadcast the seed evenly over the prepared strips. Cover with mineral soil (1-2 inches). Roll the planted area to assure good soil-seed contact.
- Spot*: Plant 2 to 3 seeds per spot, 1-4 inches deep. Cover with mineral soil and seal planting hole with adequate pressure.
- Machine*: Plant seeds 1-4 inches deep. Cover with mineral soil and use packing wheels.

Planting Rates:

When seeding rates in pounds per acre are not available, use the following general seeding rates:

- For tree species, use a minimum of 1500 seeds per machine or hand planted acre and 3000 seeds per seeded acre for broadcast or strip seeding. For shrub species, double the tree rate.
- For direct seeding wildlife habitat development or wetland restoration, a minimum rate of 750 seeds per acre can be used, provided there is an adequate mature seed source of desired species within 300 feet. If a mature seed source is not close, follow the above general use guidelines for trees and shrubs.

Species and Plant Spacing

Field/ Row	Species	Planting Rate LBS/Acre	Planting Method #	Spacing Ft. X Ft	Planted Acres	Total LBS
				Ft X Ft		
				Ft X Ft		
				Ft X Ft		
				Ft X Ft		
				Ft X Ft		
				Ft X Ft		
				Ft X Ft		
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				Ft X Ft		
				Ft X Ft		
				Ft X Ft		
				Ft X Ft		
				Ft X Ft		
				Ft X Ft		
				Total:		

* *Spot planting, Machine planting, Broadcast planting, Strip Planting*

OPERATION AND MAINTENANCE: Care after direct seeding

Weed Control: Elimination of competing vegetation is normally carried out for one to five years after planting. Weed control is an important factor in tree and shrub seedling survival, especially for hardwood species. Weed control will be accomplished through **cultivation** and/or **herbicide** use.

Mechanical or hand cultivation should be kept at least 6 inches from the seedling and no deeper than 3 inches to avoid damage to the seedling and roots. Additional methods may be needed to control weeds closer to the seedling. The use of herbicides usually provides good weed control. Mowing **generally does not** provide adequate control after establishment since the weeds are still competing for nutrients and water; also potential damage to tree seedlings from mowing is high. High mowing (>10 inches) to control flowering and seed development of weeds in the establishment year can be beneficial.

Pest Management: Control of weeds (which may hide rodents or rabbits), repellants or poisons, and hunting should be considered to reduce damage from wild animals. New seedlings should be monitored for potential wildlife, insect and disease problems and appropriate control measures taken if problems are found.

Livestock Exclusion: Plant injury or death should be controlled through preventative measures. Domestic animals that might graze on seedlings should be excluded.

Replanting: Some sites may have unsatisfactory germination or plants may die over time to a variety of causes. The decision to re-plant for some or all of the losses or failures will be based on whether or not the remaining plants will likely meet the desired purpose(s) and any program requirements. After two growing seasons, a final status check of the plantings or regeneration should be conducted. For this planting, an acceptable level of plant establishment is _____ woody plants per acre.

Operation and Maintenance - Summary

1. Competing vegetation should be controlled until the woody plants are established.
2. State noxious weeds will be controlled.
3. Reseeding will be required when survival is inadequate.
4. Plantings should be inspected periodically and protected from adverse impacts including insects, diseases, competing vegetation, wildfire and damage from livestock or wildlife.

ADDITIONAL COMMENTS:



Broadcast seeding with a fertilizer buggy.

Planning Map of Seeding Area (indicate North on map)

Scale 1"=_____ ft. (NA indicates sketch not to scale. Grid size = 1/2" by 1/2")

