

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

****POLICY/PROCEDURE DIRECTIVE****

REGULATORY 95-2

(Replaces Regulatory 94-2 Remove From Notebook)

- Subject:** Planting plans for areas for which the approved postmining land use is undeveloped land.
- Effective:** March 15, 1994 (Revised November, 1995)
- Purpose:** To provide standard criteria, including tree and shrub species, herbaceous species, and planting locations for revegetation plans on areas for which the approved postmining land use is undeveloped land.

The following criteria for tree and shrub species, herbaceous species and planting locations shall provide the basis for evaluation of planting plans on areas for which the approved postmining land use is undeveloped land. The criteria shall be used by the Permitting Section for review and approval of planting plans and by the Inspection & Enforcement Section for approval of tree and shrub plantings prior to bond release, pursuant to receipt of the permittee's "Verification of Proper Planting of Tree Seedlings/Posts". (See PPD Inspection & Enforcement 94-1)

Tree and Shrub Stocking Levels, Planting Spacing and Planting Locations

Permitted areas that have a postmining land use designation of "undeveloped" shall have between ten and fifty percent of the affected area planted with trees and shrubs. That is, on permits for which the postmining land use has been determined through an ARP to be undeveloped land after herbaceous ground cover for pasture or grazing land has been planted, 10 to 30 percent of the revegetated area shall be planted with trees. On permits for which the postmining land use has been determined to be undeveloped land at the time of permit application, or for which an ARP to identify the post mining land use as undeveloped has been approved prior to the planting of herbaceous ground cover, 30 to 50 percent of the revegetated area shall be planted with trees.

Planting locations shall include slopes steeper than twenty degrees and area along drainages and around permanent sources of water. Block plantings in the interior of the affected area or plantings in multiple rows along or part of the perimeter of the affected area are also acceptable.

Throughout the planted area a minimum of 600 seedlings per acre (or stems when direct seeded) must be planted. This can be accomplished through direct seeding or by the planting of bare root or containerized seedlings. Seedlings can be planted by hand or machine, and should be planted at an 8 foot by 8 foot spacing or closer to meet this stocking requirement.

Tree and Shrub Species for Hand or Machine Planting

Tree and shrub species acceptable for planting when the post mining land use is "undeveloped" must include:

Hardwoods and Shrubs (pick at least four)

European Black Alder (*Alnus glutinosa*)

White Ash (*Fraxinus americana*)

Green Ash (*Fraxinus pennsylvanica*)

Sugar Maple (*Acer saccharum*)

Sweetgum (*Liquidambar styraciflua*)

Tuliptree (*Liriodendron tulipifera*)

* American Sycamore (*Plantanus occidentalis*)

* White Oak (*Quercus alba*)

Red Oak (*Quercus rubra*)

Black Locust (*Robinia pseudoacacia*)

Quaking Aspen (*Populus tremuloides*)

* River Birch (*Betula nigra*)

* Bankers Willow (*Salix cottettii*)

* Purple - Osier Willow (*Salix purpurea*)

* Black Willow (*Salix nigra*)

* Buttonbush (*Cephalanthis occidentalis*)

* Cottonwood (*Populus spp.*)

Black Chokeberry (*Aronia melancarpa*)

Silky Dogwood (*Cornus amomum*)

Gray Dogwood (*Cornus racemose*)

Washington Hawthorne (*Crataegus spp.*)

Indigobush (*Amorpha fruticosa*)

Bicolor Lespedeza (*Lespedeza bicolor*)

Bristly Locust (*Robinia hispida*)

American Crabapple (*Malus spp*)

-AND-

Conifers (pick at least one)

Eastern White Pine (*Pinus strobus*)

Virginia Pine (*Pinus virginiana*)

Red Pine (*Pinus resinosa*)

Austrian Pine (*Pinus nigra*)

Norway Spruce (*Picea abies*)

*Species do best when planted on lower slopes or along streams. These species are suitable for use as dormant woody cuttings, stakes, or posts (except for White Oak and River Birch).

Herbaceous Cover

Herbaceous mixes for wildlife habitat and reforestation do not vary much from conventional reclamation revegetation mixes. The only notable difference is that neither Kentucky 31 Fescue (Festuca arundinacea) nor Sericea Lespedeza (Lespedeza cunerta) will be accepted in any revegetation mix. Neither species benefits wildlife and neither is compatible with tree planting efforts.

For areas for which the approved postmining land use is determined to be undeveloped land at the time of permit application, or for which an ARP to identify the postmining land use as undeveloped land has been approved prior to the planting of herbaceous ground cover, a revegetation mixture acceptable for wildlife habitat and compatible with tree planting efforts must consist of the following:

<u>lbs/ac</u>	<u>Annual Grass</u>
10-15	Foxtail Millet (<u>Setaria italica</u>)
	-AND-
	<u>Perennial Grasses</u> (pick one)
2-4	Redtop (<u>Agrostis gigantea</u>)
5-10	Perennial Ryegrass (<u>Lolium perenne</u>)
2-3	Weeping Lovegrass (<u>Eragrostis curvula</u>)
	-AND-
	<u>Legumes</u> (pick two)
4-6	Ladino Clover (<u>Trifolium repens</u> var "ladino")
5-8	Birdsfoot Trefoil (<u>Lotus corniculatus</u>) (may be allelopathic)
5-8	Kobe Lespedeza (<u>Lespedeza striata</u> var "kobe")
5	Appalow Lespedeza (<u>Lespedeza cuneate</u> var "appalow")

Direct Seeding Tree and Shrub Species

Some tree and shrub species can be established with the revegetation mixture by direct seeding. Many pioneer species which would naturally invade cleared areas can be established by hydroseeding. These species typically are light-seeded, intolerant of shade, and have rapid juvenile growth. Care should be taken not to sow tree and shrub seed with competitive grasses and legumes. Trees and shrubs to be hydroseeded must include:

<u>PICK AT LEAST TWO</u>	
<u>Shrubs</u>	<u>lbs/acre</u>
Bristly Locust	1-2
Silky Dogwood	1
Bicolor Lespedeza	1
Indigobush	0.5-1
	-AND-
<u>PICK AT LEAST TWO</u>	
<u>Trees</u>	
Black Cherry	1
Black Locust	0.25 - 0.5
Green Ash	2
Sycamore	1
Virginia Pine	0.25-0.5
White Ash	1

Prior to hydroseeding, tree and shrub seed may require stratification (cold storage 35-40F) or scarification (seed agitated in concentrated H₂ SO₄ and rinsed). Consult the following table for recommended treatment:

<u>Species</u>	<u>Stratification (Cold Storage) (days)</u>	<u>Scarification (minutes)</u>
Bristly Locust	none	30
Silky Dogwood	30	none
Bicolor Lespedeza	none	25
Indigobush	none	30
Black Locust	none	30
Green Ash	60	none
*Virginia Pine	20	none

*Pine seed may require repellent to discourage rodent or avian damage.



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