

NATURAL RESOURCES CONSERVATION SERVICE CONSERVATION PRACTICE SPECIFICATION

TREE/SHRUB ESTABLISHMENT

(ACRE)

CODE 612

I. SCOPE

The work shall consist of providing all necessary materials, labor, and equipment to establish trees and/or shrubs as described on the conservation map or forest harvest plan.

II. SPECIFICATIONS

General

Determine and document suitability of soils for the proposed treatment. Refer to Table 1 - *Soil Rating Criteria for Hand Planting Suitability* and Table 2 - *Soil Rating Criteria for Machine Planting Suitability* in conjunction with the soil survey of the treatment area on an onsite investigation.

Tree characteristics and adaptations to site characteristics for species suitable for tree farms and reforestation can be found in Table 18. Species selection matrix - tree farms and reforestation of the Tree and Shrub Planting Handbook.

III. MATERIALS

Selection of plant materials will be based upon the objectives of the landowner and the criteria listed in the practice standard.

Plant material will be adapted to treatment site conditions.

All seed shall be bagged and labeled in accordance with Nevada State Seed Law and Regulations - Nevada Revised Statutes, Chapter 587, "Agricultural Products and Seeds." Seed label information will include purity and germination percentages.

Seed lots should be a minimum of 80% pure live seed (PLS) and minimum purity of 80%.

Seed germination testing shall have occurred within the last 12 months.

Seedling orders must be timed such that availability is assured, dormancy is maintained and delivery is timely.

Seedling stock shall not be less than 1/4" in caliper 1" above the root collar. Shoot to root ratio must not exceed 4:1 and a 2:1 ratio is preferred.

Bare rootstock should be received in packaging material that allows for gas exchange and retention of humidity. Bare root or containerized stock must be kept moist but not wet prior to planting.

IV. SITE PREPARATION

Site conditions characterized by heavy slash or debris, dense growths of undesirable, competing vegetation or some combination thereof, need to be treated prior to seeding. See FOREST SITE PREPARATION (Code 490) standards and specifications for guidance.

V. ESTABLISHMENT METHODS

Direct Seeding Methods

Drill Seeding. The preferred method of sowing seed when site conditions permit. Seed drills equipped with furrow openers, depth control and seed flow mechanisms and press wheels or drags will be used if available. Standard grain drills may be used but site conditions may preclude their use. Rangeland drills are better suited for the conditions commonly associated with wildland seedings.

Broadcast Seeding. This method should be used when site conditions prevent the use of drill seeders. Some of these conditions are steep slopes, stony or bouldery soil surface horizons, and accumulations of slash or other woody debris. This method requires pretreatment of existing vegetation to reduce or eliminate competition for water, nutrients and space.

V. ESTABLISHMENT METHODS *(continued)*

Direct Seeding Methods *(continued)*

Broadcast seeding is commonly accomplished by air operations in order to seed large areas.

Where conditions permit, broadcast by hand, cyclone or by drill without seed placement mechanism is appropriate.

Seeding rates are usually double the amount of PLS that are recommended for drill seeding. Seed should be broadcast uniformly and covered by dragging, harrowing, rolling or other method whenever possible. Burned areas should be broadcast seeded before rains settle the ash and surface crusting occurs.

- Seeding rates will be specified in terms of pure live seed (PLS), exclusive of any seed coating.
- Fall plantings are generally more successful than spring seedings.
- Seeding shall be performed across slope whenever possible.

Planting

Establishment of trees and shrubs by planting bare root or containerized stock can be the most successful method but this must be weighted against the high initial cost and the availability of adapted plant materials.

- Bare root seeding dormancy must be maintained prior to planting. If planting activities cannot begin within 2 weeks of receipt of bare root stock, long term storage becomes necessary. Bare root stock will be stored at temperatures of 33 to 36 degrees F. Snow caches provide an expedient storage method for high elevation plantings.
- Seedlings will be protected from desiccation when transporting them to planting sites up to the moment of planting.
- Plant seedlings in early spring as soon as the soil is frost-free while soil moisture conditions are optimum. Planting holes must be of sufficient size and depth to insure that roots go straight into the ground in more or less natural form.

Hand Planting. This method is commonly used where plantings are of small extent or site conditions preclude mechanical means. Shovels, planting bars, dibble sticks or mattocks are used to create a hole for the seeding.

Experienced planters can plant 300 to 500 seedlings per eight-hour day. Expect no more than 200 seedlings planted per day with inexperience personnel.

- Scalp an area at least 2 feet in diameter to mineral soil.
- Dig holes deep enough to accept the entire root system or plug without distortion. Roots must not be curled upward (J-rooted) nor in a wad in the bottom of the hole.
- Care should be taken to avoid root damage when separating seedling from container or plug. Backfill planting holes to the root collar or slightly above in such a manner to eliminate air pockets or voids.

Machine Planting. Plantings of large extent where site conditions permit are more economically established with the use of tractor-drawn mechanical tree planters. A single tree planter with a trained operator can plant up to 4000 seedlings in an 8-hour period under ideal conditions.

VI. OPERATION AND MAINTENANCE

Competing vegetation will be controlled until the woody plants are established. Adverse soil moisture conditions account for the most limiting factor in seedling establishment. Seedling release from competing vegetation must be accomplished early in the growing season in order for seedlings to capitalize on limited soil moisture.

Replanting will be required when survival is inadequate. Trees and shrubs will be protected from fire, insects, disease, and animals until established. Supplemental watering may be desirable to ensure adequate survival. Damaging pests will be monitored and controlled. Periodic applications of nutrients may be needed to maintain plant vigor.

REFERENCES

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Smith, D.M., Hawley, R.C. 1962 The Practice of Silviculture. John Wiley & Sons, Inc., New York.

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Table 1 - Soil Rating Criteria for Hand Planting Suitability

FACTOR	WELL SUITED	MODERATELY-WELL SUITED	POORLY SUITED	NOT SUITED	FEATURE	IMPACT
Slope	<35%	35-80%	>80%	--	Slope	Reduced efficiency
Depth to Restriction - Cementation class: ≤ WC MC > SC	>0" >12" ----	---- 8-12" ----	---- <8" ----	---- ----" <12"	Restrictive Layer	Obstruction
Particle Size Separates - Layers ≥3" thick within 12" of the surface	----	>85% more coarse than vfs	----	----	Texture	Sloughing
Plasticity Index - Greatest value of any layer within 12" of the surface	<20	20-30	>30	----	Stickiness	Reduced efficiency
Rock fragments within 12" of the surface - Greatest value of any layer: ≥3" <3" ≥3" on the soil surface	<15% <35% <3%	15-35% 35-75% 3-15%	36-75% >75% 16-50%	>75% ---- >50%	Coarse Fragments	Obstruction
Water Depth Year around	≥12"	<12"	----	----	Wetness	Reduced efficiency
Ponding				Year around	Wetness	Reduced efficiency

Table 2 - Soil Rating Criteria for Mechanical Planting Suitability

FACTOR	WELL SUITED	MODERATELY-WELL SUITED	POORLY SUITED	NOT SUITED	FEATURE	IMPACT
Slope	<5%	5-15%	15-25%	>25%	Slope	Reduced efficiency
Depth to Restriction - Cementation class: ≤ MC SC, VS IND	>0" ---- ----	---- <12" ----	---- ---- ----	---- ----" <12"	Restrictive Layer	Obstruction
Particle Size Separates - Layers ≥3" thick within 12" of the surface	----	>85% more coarse than vfs	----	----	Texture	Sloughing
Plasticity Index - Greatest value of any layer within 12" of the surface	<20	20-30	>30	----	Stickiness	Reduced efficiency
Rock fragments within 12" of the surface - Greatest value of any layer: ≥3" <3" ≥3" on the soil surface	<5% <15% <0.1%	5-15% 15-35% 0.1-3%	16-35% 36-50% 3-15%	>35% >60% >15%	Coarse Fragments	Obstruction
Water Depth Year around	≥12"	6-12"	<6"	----	Wetness	Reduced efficiency
Ponding				Year around	Wetness	Reduced efficiency