PLANT ESTABLISHMENT PROCEDURES

This section of the Pacific Islands Area Vegetative Guide includes generic plant establishment procedures including site preparation and planting for commonly used planting methods. Refer to the Conservation Practice tables in the Vegetative Guide for planting rate and spacing recommendations. Planners should also refer to individual conservation practice Standards for practice specific and/or additional criteria for plant establishment.

Plants such as grasses, legumes, non-legumes, and annuals are usually established by planting seeds or by planting vegetative material (stolons, sprigs, or rhizomes).

Ornamental ground covers are normally established by planting vegetative material.

Woody plants such as trees and shrubs are usually established by planting seedlings or cuttings.

Care in handling and planting the seed, cuttings, seedlings, or vegetative material will ensure an acceptable rate of survival. Only viable, high-quality, and adapted planting material will be used.

PLANTING SEEDS

Site Preparation

Site preparation for planting seeds may be accomplished by conventional tillage or no-till seeding methods and conservation tillage equipment, where practicable.

Where soil conditions permit, conventional tillage site preparation usually consists of one primary tillage operation, such as plowing or ripping, followed by disking. Prepare a firm seedbed. If planting large areas of sloping land and no-till is not possible, establish new plantings in increments or in strips alternating with undisturbed areas to minimize erosion. All tillage will be on the contour or cross slope to minimize the erosion hazard, unless topography does not permit it and may cause safety concerns. Treat soil quality concerns, such as tillage pans, to prevent exacerbation of existing problems.

Site preparation should include mechanical or chemical removal of unwanted plants in the area. Because of potential seed germination, root suckering or shoot persistence, removal of unwanted plants may need to be repeated two to three times prior to planting the desired species. Allow for a time lapse between each removal activity to ensure adequate control/eradication of unwanted plants. This applies to all site preparation activities, whether irrigated or not irrigated.

No-till seeding may involve the use of herbicides and conservation tillage equipment to prepare the seedbed.

Planting Seeds

Planting of seed may be accomplished by broadcasting, drilling, or hydroseeding.

Where seed is broadcast, dragging the area with a chain, light plank, or other suitable implement will help to ensure good soil-seed contact.

Large seeds are generally planted deeper than small seeds. A general recommendation is to plant at a depth equal to four times the diameter of the seed.

Hydroseeded plantings must not be allowed to dry out. Germination and seedling emergence may be low if the mulch/seed mixture is not kept moist.

PLANTING VEGETATIVE MATERIAL (STOLONS, SPRIGS, OR RHIZOMES)

Where Terrain Permits the Use of Equipment

Where terrain permits the use of equipment, such as tractors, site preparation may be the same as for seeding described above.

Stolons, sprigs, and rhizomes should be evenly distributed on the prepared ground and disked in. For a more positive placement of the vegetative material, seedbed preparation may be followed by opening furrows at a maximum depth of 6 inches. Vegetative material is then placed in the furrows. Cover the material with soil by disking or other suitable means, leaving some leaves exposed, then compact lightly to ensure good plant-soil contact. A mechanical sprig planter may be used, soil conditions and terrain permitting.

Where Terrain Restricts the Use of Equipment

Where terrain restricts the use of equipment, the minimum site preparation shall consist of providing 6-inch deep holes. Fertilize according to soil test recommendations. Place the recommended amount of fertilizer in each hole and cover with approximately 1 inch of soil. Sprigs should be inserted at least 5 inches in the hole. The sprigs should have a minimum of two nodes. The hole should then be filled with soil and compacted to ensure good plant-soil contact. Leave at least a 1-inch depression in the hole to trap rainwater and other moisture.

PLANTING TREES AND SHRUBS

Site Preparation

A precondition for tree/shrub establishment is appropriately prepared sites. If site preparation is needed, consider applying the conservation practice Tree/Shrub Site Preparation (490).

Tree/shrub site preparation is the treatment of areas to improve site conditions for establishing trees and/or shrubs. This practice is used to encourage natural regeneration of desirable woody plants and to permit artificial establishment of woody plants. Methods of site preparation include: scarification for natural regeneration, other mechanical methods (e.g. disking, ripping, mowing), and chemical (herbicides). Very shallow soils over pahoehoe lava may require making individual holes to avoid disturbing the entire site.

Planting Stock

Trees and shrubs may be planted as container-grown seedlings, bare root stock, and/ or unrooted cuttings.

Container-grown (dibble tubes, plastic and clay pots, etc.) stock or seedlings are preferred to bare-root stock.

Potting bare-root stock 3 to 4 months before planting will help produce more vigorous transplants.

Cuttings may be rooted in pots or beds, and then transplanted.

Unrooted cuttings may be planted directly depending on the species, available moisture, and other conditions. Consider using a rooting hormone to enhance rooting percentage.

If bare-root stock is not planted immediately, it should be “heeled-in” in a V-shaped trench under shade or potted and kept moist.

Planting Trees and Shrubs

Selection of planting technique and timing will be appropriate for the site and soil conditions.

Plant trees and shrubs in furrows or individually dug holes. If planting in furrows, be sure the

grade is on the contour. Container-grown seedlings or bare-root stock should be planted slightly deeper than they grew in the nursery. Do not bend or crowd any roots.

OTHER MANAGEMENT ACTIONS TO ENSURE ADEQUATE STAND ESTABLISHMENT

This section includes other generic management actions which may be required to ensure an adequate stand establishment. Each site and planting should be evaluated to determine which actions are required. Some of the same or similar actions may already be included in individual conservation practice Standards and should be followed instead of these.

Planting Dates

Planting dates shall be scheduled during approved dates for the species and to optimize soil moisture for germination and/or establishment.

In general, planting in sites without supplemental irrigation should be done as early in the wet season as possible. Avoid planting on hot, windy days.

Planting in sites with supplemental irrigation may be done at any time, provided that adequate moisture is provided immediately after planting.

Supplemental Water for Plant Establishment

Supplemental water via an irrigation system will be applied to establish the plants, if necessary. Irrigation systems must be in place prior to planting. Water immediately after planting, and provide supplemental water for establishment as needed.

Soil Amendments

Apply soil amendments (e.g. lime, fertilizer, compost) according to soil test results to ensure stand establishment. All soil amendment application shall follow the requirements in the Field Office Technical Guide (FOTG) Nutrient Management (590) Standard. Legume seeds should be treated with the correct legume inoculants before planting.

Protection of Plantings

Plantings shall be protected from pests (e.g. weeds, insects, diseases, livestock, and/or wildlife) as necessary to ensure stand establishment. All pest control shall follow the requirements in the Field Office Technical Guide (FOTG) Pest Management (595) Standard.

Mulching

Mulching around trees or shrubs will help to conserve moisture and control weeds. Organic mulches, cinders and plastic mulches are effective, but local site conditions must be considered. For example, planting seedlings or cuttings through black plastic mulch and irrigating each plant with a drip irrigation system works well for farm windbreak plantings, but may be inappropriate for wildlife plantings as the plastic may be a hindrance to wildlife. Consider applying the practice Mulching (484), if appropriate.

OPERATION AND MAINTENANCE

The Operation and Maintenance section of each conservation practice Standard includes required actions to be carried out after establishment that contribute to the longevity and functioning of the conservation practice throughout its expected life.

Actions may include inspections, reseeding or replanting, mowing, fertilization, and pest control or protection. This section may also include requirements for the timing of actions in consideration of wildlife habitat and nesting season and grazing rotations of livestock.