

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE SPECIFICATION
TREE/SHRUB ESTABLISHMENT
(acre)
CODE 612

SCOPE

This document establishes the technical details, workmanship, and quality and extent of materials required to install the practice in accordance with the Conservation Practice Standard. The information shall be considered when preparing site-specific specifications for the practice.

The NRCS Hawaii Jobsheet for this practice shall be used to document the site-specific specifications for installing, operating, and maintaining the practice on a specific field or treatment unit. Other documents (worksheets, maps, drawings, and narrative statements in the conservation plan) may be used in addition to the Jobsheet to document site specifications or to plan or design the practice.

SPECIES SELECTION

Refer to Table 1 for examples of suitable species. There are many species and these are examples only. Choose species most compatible with the landowner's wishes, soils, and local growing conditions. The Table and pictures of most of the plants are also included in the Hawaii Vegetative Guide available online at:

<ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/vegetative/>

Suggested spacing and adaptation by elevation and rainfall are indicated for the examples in Table 1. Spacing may range from 20 X 20 feet for beautification plantings with wide-crowned trees to 8 x 8 feet, or less, for short-rotation wood fiber plantations.

Jobsheet specifications will specify the species and spacing required to achieve the intended purpose. Confirm specifications with a local forestry specialist.

For specialized objectives, comply with applicable specifications for **Windbreak/ Shelterbelt Establishment** (380), **Windbreak/ Shelterbelt Renovation** (650), **Recreation Area Improvement** (562), **Critical Area Planting** (342), **Upland Wildlife Habitat Management** (645), **Alley Cropping** (311), and **Forest Stand Improvement** (666).

INSTALLATION PROCEDURES

Planting Stock

Good planting stock will be used. Potting bare-root stock 3 to 4 months before planting will help produce more vigorous transplants. Dibble tube stock is preferred to bare-root stock. Cuttings may be rooted in pots or beds 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" a V-shaped trench under shade or potted and kept moist.

Site Preparation

Control competitive grasses or shrubs where cuttings, seeds, or seedlings are to be planted. A minimum treatment is to destroy competing vegetation in a three-foot wide band down the tree rows. This may be accomplished by herbicides or cultivation. Good site preparation will promote rapid growth and survival of plants. Till and subsoil as needed. If individual planting holes are dug through sod or untilled ground, make these as large as practicable and clear a 3-foot diameter circle around each plant at the time of planting.

Scarification of the soil may be needed when direct seeding. Natural regeneration of koa from seed is enhanced by scarification. Refer to the **Forest Site Preparation** (490) Standard.

Planting

Plant cuttings, seeds, or seedlings as early in the wet or rainy season as possible. Because precipitation varies from year to year at different locations, consult the local rainfall records for optimum planting dates before work begins.

Irrigation may be necessary in some areas and for some species. If irrigation is necessary, have the system in place prior to planting.

Planting on irrigated sites may be done at any time provided that adequate moisture is supplied immediately after stock or seed is in the ground.

Avoid planting on hot, windy days.

Plant stock either in a furrow or individual holes. Do not bend or crowd the roots. Plant bare-root stock as deep or slightly deeper than they grew in the nursery.

Mulching around the seedlings will help to conserve moisture and control weeds. Organic mulches, cinders, and plastic mulches are effective. Planting seedlings or cuttings through black plastic mulch and irrigating with a drip tube for each tree or shrub line works well for many types of plantings. Refer to the practice standard and specification for **Mulching** (Code 484).

Protection

Trees and shrubs will be protected from fire, herbicide drift, insects, disease, animals, and vehicle and human traffic, as appropriate to ensure establishment. Seek professional assistance for diagnosis and control measures. If pest control is required, refer to soil/pesticide interaction ratings if pesticides are used and to the **Pest Management** Standard (595). If exclusion of animals and vehicle and human traffic is required, refer to practice standard **Use Exclusion** (Code 472). For newly planted sites subject to grazing, comply with a planned grazing system (refer to practice standard **Prescribed Grazing** Code 528).

Fertilization

Fertilizer and lime will be applied as needed to establish the trees and shrubs. Application will be based on a soil test and the practice **Nutrient Management** (Code 590).

Table 1. Suitable Tree and Shrub Species (Page 1 of 1)

Species	Scientific Name	Elevation (1000')	Minimum Rainfall ^{1/} (inches)	Spacing in Feet	
				Minimum	Maximum
Height Class < 35'					
koai'a ^{2/ 3/}	<i>Acacia koaia</i>	1 - 6	30	6 x 6	12 x 12
mamane ^{2/ 3/}	<i>Sophora chrysophylla</i>	1.5 - 8	30+	6 x 6	12 x 12
milo ^{2/ 4/}	<i>Thespesia populnea</i>	0 - 2	30+	10 x 10	20 x 20
noni ^{2/ 4/}	<i>Morinda citrifolia</i>	0 – 1.5	30+	6 x 6	12 x 12
wiliwili ^{2/ 3/}	<i>Erythrina sandwicensis</i>	0 - 1	25	10 x 10	20 x 20
Height Class > 35'					
kamani ^{2/ 4/}	<i>Calophyllum inophyllum</i>	0 – 2	50+	8 x 8	20 x 20
koa ^{2/ 3/}	<i>Acacia koa</i>	1.5 - 7	60+	8 x 8	20 x 20
monkeypod ^{3/}	<i>Samanea saman</i>	0 - 1	40+	8 x 8	20 x 20
neem	<i>Azadirachta indica</i>	0 - 1	30+	10 x 10	20 x 20
Norfolk Island pine ^{4/}	<i>Araucaria heterophylla</i>	1.5 - 3	40+	10 x 10	20 x 20
'ohi'a lehua ^{2/}	<i>Metrosideros polymorpha</i>	0 - 8	60+	8 x 8	20 x 20

NOTE: This table contains examples and is not all-inclusive. Other species may be suitable. Consult a Forester or other qualified professional.

^{1/} Unless irrigated.

^{2/} Native to Hawaii or early Polynesian introduction

^{3/} Nitrogen fixing tree.

^{4/} Highly tolerant of soil salinity and wind-borne salt.