

**NATURAL RESOURCES CONSERVATION SERVICE
PACIFIC ISLANDS AREA**

CONSERVATION PRACTICE SPECIFICATION

RANGE PLANTING (550)

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.

GENERAL USE

On rangeland, native or naturalized pasture, grazed forest or other suitable location where the principle goals and method of vegetation management is herbivore based. This practice shall be applied where desirable vegetation is below the acceptable level for natural reseeding to occur, or where the potential for enhancement of the vegetation by grazing management is unsatisfactory.

Generally, seeding will not be done when greater than 15% composition (by weight) of the desirable plants are present, well distributed over the treated area, and can be managed to a stand within an acceptable time frame.

Revegetation using Range Planting (550) may be necessary following Brush Management (314) or Herbaceous Weed Control (315) if any of the following conditions exist:

- less than 15% composition (by weight) of the desirable plants are present following treatment
- desirable plants are poorly distributed over the treated area
- existing plants cannot be managed to a stand within an acceptable time frame
- there is no reasonable expectation that the desired forage plants will recover via natural regeneration.

Specified seeding/plant material rates, methods of planting, date of planting and/or species selection shall be consistent with documented guidance cited by Plant Materials Program, research institutions or agency demonstration trials for achieving satisfactory establishment.

The NRCS Pacific Islands Vegetative Guide and Planting Practices Jobsheet shall be used to document the site-specific specifications for installing, operating, and maintaining the practice on a specific field or treatment unit. Plantings that require more detailed information may require the use of other practices prior to planting and require the preparation of a special site-specific specification. Other documents (worksheets, maps, drawings, and narrative statements in the conservation plan) may be used in addition to the job sheet to document site specifications or to plan or design the practice.

SPECIES SELECTION

Refer to the Pacific Islands Vegetative Guide and Planting Practices Jobsheet for information about adapted forage plants, seeding or planting rates and rainfall and elevation requirements.

For all species recommended, the [Hawaii Pacific Weed Risk Assessment \(HPWRA\)](#) invasiveness ranking must be verified and recorded on the Jobsheet. If the invasiveness ranking is 7 or higher, special approval to use the species must be obtained from the State Rangeland Management Specialist, the Assistant Director for Technology, or their designee. The approval will be documented on the completed Jobsheet. *NOTE: Several important forage species in the PIA have HPWRA scores that are 7 or greater. You must still obtain approval in order to use them.*

ESTABLISHMENT

By Seeding

Seedbed Preparation. Seedbed preparation shall consist of plowing or ripping, followed by disking where soil conditions permit. Prepare a firm, rock-free seedbed. Use no-till seeding methods and equipment, where practicable. If planting large areas of sloping land and no-till is not possible, establish new plantings in increments or in strips across the slope or on the contour alternating with undisturbed areas to minimize erosion.

The use of pitting disc plows, intermediate pits or a contour furrower will break compacted soil, reduce soil erosion and improve moisture conditions in dry areas.

Seeding Method and Planting Requirements. Seeding may be accomplished by either broadcasting, drilling with a grain drill or special range drill, or by aerial application. Where seed is broadcast, drag the area after seeding with a chain, light harrow or plank to ensure good soil-seed contact.

Depth of seeding depends on seed size, soil moisture and soil texture. A general recommendation is to plant 1/4-1/2 inch deep on medium to fine textured soils and 1/2 -1 inch deep on coarse - textured soils. Plant deeper when soil moisture is low and shallow when moisture is abundant. Large seeds are generally planted deeper than small seeds.

By Vegetative Method (Stolons, Sprigs, or Rhizomes)

Land Preparation and Planting Requirements. Where terrain permits the use of heavy equipment, land preparation will be the same as for seedbed preparation described above. Vegetative material 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 plowing furrows at a maximum depth of 6 inches and a maximum spacing of 6 feet apart. Vegetative material is then placed in the furrow at a maximum spacing of 6 feet between sprigs. Cover the material with soil by disking or other suitable means, in the direction of the furrow; then compact lightly to ensure good plant-soil contact.

Dense plantings will result in a more rapid stand establishment and fewer weeds. Unless planting material is in short supply, make the furrows about 3 feet apart and place the stolons, sprigs or rhizomes as close as practicable in the furrows.

Where terrain restricts the use of heavy equipment, the minimum site preparation shall consist of providing 6-inch deep holes at the maximum spacing shown in Table G in the NRCS Pacific Islands Vegetative Guide for the vegetative material being planted. Sprigs should be inserted at least 5 inches in the hole. The sprigs should have a minimum of two nodes, both to be buried. The hole should then be filled with soil and compacted to ensure good plant-soil contact.

Adequate moisture is critical when planting vegetative material. Plant only after the rainy season has begun and the soil is moist.

Seedbed or site preparation, seeding and vegetative planting shall be cross-sloped or on the contour to minimize erosion hazard.

By Interseeding Legumes

Where the intent is to establish legumes in an existing grass range, use a special range drill or a no-till drill or broadcast the legume seed into the grass at the seeding rate given in Table G in the NRCS Pacific Islands Vegetative Guide. Drill seed directly into existing plant community after excess forage has been

removed by grazing or mowing. If broadcasting, use a disc to cover seed or graze livestock using high numbers and a short grazing period to trample seed into the ground.

This type of seeding must be part of a grazing management system that permits adequate control of the livestock. Refer to practice standard 528-Prescribed Grazing.

By Outplanting Trees/Shrubs

The land will be weed-free prior to planting. Where seedlings/saplings will be planted, remove all plant litter or debris prior to planting. Leaving plant stubble or litter on the soil in-between planting locations is recommended to protect the soil surface from potential erosion.

The soil should be moist at the time of planting. Use only fresh and recently acquired plant materials that have been acclimatized and grown in dibble tubes and/or plant pots. Dig a hole of sufficient size to insert the plant root and growth medium and backfill. Carefully remove the seedling/sapling from the tube or pot, placing it into the hole, and making certain the roots are not bound up. Backfill the hole with loose soil material, and gently tamp to firmness. The root collar of the plant should be at the soil surface, not buried or exposed, when it is properly placed and tamped. Place mulch material (eg. organic matter, cardboard, wood chips, or other non-plastic weed-free material) around the planting to a depth no greater than 2-inches. If you are supplying supplemental irrigation, securely place the drip emitter(s) from the supplemental irrigation source within a 6-10" radius from the plant stem.

Supplemental irrigation, if needed, should be applied deeply, infrequently, and probably for no longer than 6-8 months, depending upon site conditions. Deeper and less frequent irrigations will encourage deeper root growth and soil exploration by roots, as opposed to shallow, frequent irrigation events. Fertilizer is generally not recommended for out plantings.

FERTILIZATION OR SOIL AMENDMENTS

The Nutrient Management (590) standard shall be used when working with the land user on a fertilizer or soil amendment program. Fertilizer and other amendments should be applied according to soil test results and recommendations, taking into account any NRCS adjustment guidelines established for specific soil conditions [e.g., skeletal soils (soils with high rock content in the profile)]. Use of fertilizer is generally not recommended for tree/shrub out plantings.

MANAGEMENT

Range Planting is considered a facilitative practice in the PIA. At least one year of Prescribed Grazing (528) must also be planned as an accompanying management practice for all planned instances of Forage and Biomass Planting.

NRCS Financial Assistance Programs: Whenever a cooperator enters into a contract with the NRCS, no less than one year and no greater than three years of Prescribed Grazing (528) must be planned and contracted to accompany each instance of contracted Range Planting.

Newly planted range shall not be grazed or harvested until the stand is well established and has reached the minimum height and stage of growth, as identified in the Prescribed Grazing plan and documented on the Jobsheet. The Prescribed Grazing plan must also identify other important management considerations including the proper degree of grazing utilization (stubble heights), minimum heights to resume grazing, and estimated recovery periods. See the Prescribed Grazing (528) practice standard and specification for details.

Where plantings are established to meet wildlife needs, grazing and/or harvesting will be performed in a manner complimentary to the wildlife habitat and life cycle requirements. Grazing management activities in support of optimizing wildlife habitat will be described in the Prescribed Grazing job sheet.

WEED CONTROL

If undesirable weeds are present in a density great enough to prevent proper establishment of the forage stand, Herbaceous Weed Control (315) must be planned using the PIA Plant Control - Clearing and Cutting Practices Jobsheet. The Herbaceous Weed Control (315) standard and specification must be followed when working with the land user on a weed control program.

Weed control activities shall not disturb or cause undue harm or harassment to identified native wildlife species. Plan and perform all weed control activities in a manner that is complimentary to the habitat and life cycle requirements of identified native wildlife species.

Mechanical. Mow with a rotary or flail mower when the weeds over top a new planting. Mow above the forage plants, if possible. Mow between gratings on an established range.

Limited and controlled grazing may be used to control broadleaf weeds and annual grasses if mowing is not practicable. Livestock numbers should be sufficient to accomplish desired control. Remove livestock if seedling damage occurs.

Remove all weeds from the site as soon as possible. This includes herbaceous and woody weeds, and may involve chemical treatment. Any chemical treatments will be done with extreme care so that the planted species are not affected by drift or direct application of herbicides. Do not use livestock to remove weeds by grazing until the plants have fully established (may take as long as 3-7 years for woody out plantings). In the case of native species planting, grazing should be removed and the planted area protected from herbivory by a well-constructed fence.

Chemical.

When using herbicides, the recommendations of the University of Hawaii, College of Tropical Agriculture and Human Resources (CTAHR) AND the product label must be followed. Refer to CTAHR's [Weeds of Hawaii's Pastures and Natural Areas; An Identification and Management Guide](#) for approved herbicide recommendations. If a recommendation published by CTAHR is not available, contact the PIA State Rangeland Management Specialist for guidance.

Do not use herbicides when a full cover of desirable legumes is present unless legumes are tolerant to the herbicide used. The Integrated Pest Management (595) standard shall be used when working with the land user on a weed control program.

Herbicide users should be cautioned as follows: If herbicides are handled or applied improperly, or if unused portions are not disposed of safely, they may be injurious to humans, domestic animals, desirable plants, fish, or other wildlife and they may contaminate nearby crops and other vegetation. Follow the directions and heed all precautions on the container label.

Cooperators should be aware of and adhere to the provisions of state and federal laws and regulations concerning the use of agricultural chemicals.

Spot Control of Undesirable Weeds. Use appropriate chemicals according to manufacturer's recommendations, treating individual weeds or patches of weeds carefully, avoiding the desired species.

Wick Applications. Use appropriate chemicals according to manufacturer's recommendations on weeds that are at least 6 inches taller than the desired species.

SEEDING MIXTURES

The Pacific Islands Vegetative Guide and Planting Practices Jobsheet shall be used when planning range plantings. Ecological Site Descriptions and/or Forage Suitability Group Descriptions, located in the Field Office Technical Guide (FOTG), Section II, can also be used to assist in species selection and production estimates for planted stands that have reached maturity.

For planting mixtures of two or more species, determine the total pounds of PLS required by multiplying the full seeding rate of each species by the percentage desired within the total mixture. Use the Job sheet for step-by-step calculations in the appropriate tables.

OPERATION AND MAINTENANCE

Inspect and calibrate equipment prior to use to ensure proper rate, distribution and depth of planting material. Growth of seedlings or sprigs should be monitored for water stress. Water stress may require reducing weeds, early harvest of any companion crops, irrigating when possible, or replanting failed stands.

A grazing plan that outlines important management considerations including the proper degree of grazing utilization (stubble heights), minimum heights to resume grazing, and estimated recovery periods must be developed in accordance with the Prescribed Grazing (528) practice standard and specification. Evaluate forage production and health each season, or as needed, to determine management inputs needed to achieve the desired purpose(s).

New plantings must not be grazed or harvested until the stand has matured beyond the seedling stage, and reached the minimum establishment height to begin grazing as described in the 528-Prescribed Grazing specification and documented on the Prescribed Grazing Jobsheet.

Invasion by undesirable plants should be controlled by cutting/mowing, using selective herbicide(s), or by grazing management. The Prescribed Grazing plan must identify the livestock type, stocking rates, density and duration of grazing to achieve control of invasive plants while maintaining health and vigor of desirable plants. Insects and diseases will be controlled when an infestation threatens stand survival.