

## Practice Specification Herbaceous Weed Treatment (Code 315)

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### 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

Herbaceous weed treatment will be applied in a manner to achieve the desired treatment of the target species and protection of desirable non-target species. Control measures may include using cultural, mechanical, chemical or biological methods either alone or in combination. A detailed Herbaceous Weed Treatment plan that follows the guidance in this specification must be developed and include each planned instance of Herbaceous Weed Treatment.

Herbaceous Weed Treatment will not be applied to only a part of a pasture unless the entire management unit can be managed according to the needs of the treated area. Treated areas may be temporarily fenced off to achieve management goals. Livestock and human access will be controlled based on management methods applied and restrictions as listed on the chemical labels.

In the Pacific Islands Area, when managing for invasive species that are difficult to control and typically require more than one treatment, Herbaceous Weed Treatment may be planned multiple times. For contracting purposes, the species must be listed on the PIA Pervasive Weed List.

Where weed mixtures occur that include one or more species for which approved methods have been established, the recommended control will be that prescribed for the species that is the greatest problem, provided one method will give adequate control. If this is not possible, separate control methods may be needed.

For planning purposes, the minimum treatment amount will be that which is necessary to accomplish the client's objective and the practice purpose.

Revegetation may be necessary following Herbaceous Weed Control. Document revegetation needs on the Implementation Requirements worksheet and consult the Range Planting (550) or Forage and Biomass Planting (512) practice specifications (as applicable) for details and procedures for developing a revegetation plan following Herbaceous Weed Treatment.

Where livestock are present, Prescribed Grazing (528) shall be applied to ensure the desired response from treatments.

For all Herbaceous Weed Treatment activities, equipment, tools and vehicles coming from off-site shall be clean and free of weed seeds.

Prior to commencement of any mechanical clearing, a utility check must be completed to make sure all underground utilities are avoided. The landowner/ operator or contractor shall call 1-866-423-7287 or 811 or appropriate local utilities to determine the existence of utilities at least 5 days prior to excavation.

**Figure 1**



### VARIANCES

Any requests for variances are to be submitted to the State Rangeland Management Specialist and must receive written approval prior to the commencement of the Herbaceous Weed Treatment Plan.

### **HERBACEOUS WEED TREATMENT PLAN:**

All Herbaceous Weed Treatment plans and specifications for each field or treatment unit must be designed according to the criteria included in this specification. The PIA Plant Control, Clearing and Cutting Practices Jobsheet must be used when developing Herbaceous Weed Treatment plans.

At a minimum, an herbaceous weed treatment plan shall include:

1. Goals and objectives statement.
2. Plan map and soil map for the site.
3. Pretreatment cover or density of the target plant(s) and the planned post-treatment cover or density.
4. Maps, drawings, and/or narratives detailing or identifying areas to be treated, pattern of treatment (if applicable), and areas that will not be disturbed.
5. A monitoring plan that identifies what shall be measured (including timing and frequency) and the changes in the plant community (compare with objectives) that will be achieved.

**For Mechanical Treatment Methods.** Plans and specifications will include items 1 through 5 above, plus the following:

1. Type of equipment to use for management
2. Dates of treatment for effective management.
3. Operating instructions (if applicable)
4. Techniques and procedures to be followed, including measures to prevent water quality impacts from sediment.
5. Appropriate revegetation practice following treatment to ensure the resource concern is addressed.

**For Chemical Treatment Methods.** Plans and specifications will include items 1 through 5, above, plus the following:

1. Acceptable chemical treatment references for containment and management of target species. Refer to CTAHR's [\*Weeds of Hawaii's Pastures and Natural Areas: An Identification and Management Guide\*](#) and the [\*Practitioner's Guide for Effective Non-Restricted Herbicide Techniques to Control and Suppress Invasive Woody Species in Hawai'i\*](#) for approved herbicide recommendations.
2. Document techniques to be used, planned dates, active ingredient with application rate.
3. Evaluation and interpretation of herbicide risks associated with the selected treatment(s) using WIN- PST.
4. Any special mitigation, timing considerations or other factors (such as soil texture and organic matter content) that must be considered to ensure the safest, most effective application of the herbicide.
5. Reference to product label instructions. Material safety data sheets and pesticide labels may be accessed on the Internet at: <http://www.greenbook.net/>.

**For Biological Treatment Methods.** Must follow the Prescribed Grazing (528) standard and specification and document biological control grazing plan on the Prescribed Grazing Jobsheet. Plans and specifications will include items 1 through 5, above, plus the following:

1. Acceptable biological treatment references for the selected biological agent (grazing/browsing animals only) used to contain and manage the target species
2. Document release date, kind, and number of livestock
3. Timing, frequency, duration and intensity of grazing or browsing

4. Desired degree of grazing or browsing use for effective management of target species
5. Maximum allowable degree of use on desirable non-target species
6. Special mitigation, precautions, or requirements associated with the selected treatment(s)

## **WEED TREATMENT AND CONTROL METHODS**

### **Mechanical Treatment Methods**

These include mowing, tilling, discing, or using hand tools. Mechanical brush treatments must carefully consider site topography and any slope limitations to safe equipment operations. Plan treatment areas in increments that are reasonable and practical to successful treatment and revegetation

General guidelines for control of root sprouting species or those species that re-sprout from basal stems are as follows:

1. Do not apply primary weed treatment when target species are root sprouters and no follow-up treatment is planned.
2. Schedule follow-up treatment as soon as practical, typically a few weeks into the next growing season. Treat any regrowth prior to seeding.

Root plowing or discing may be planned only when soil conditions are such that a stand of grass can be readily established.

Mechanical treatments may cause significant structural changes of plant communities and treatment areas may require substantial time to recover. The impacts which these changes may pose on plant and animal communities should be carefully considered during the planning phase. In most instances, where woody infestations are light to moderate, other alternatives such as spot-grubbing or individual plant treatment with herbicides should be considered.

### **Chemical Treatment Methods**

Chemical controls include various timing and application methods, including aerial, ground, and spot spraying. On grazed lands, timing should be immediately after a grazing event to improve application efficiency and reduce chemical application on non-target forage species.

When using herbicides in Hawaii, the recommendations of the University of Hawaii, College of Tropical Agriculture and Human Resources (CTAHR) AND the product label must be followed. If a recommendation published by CTAHR is not available, contact a University Extension Specialist or the PIA State Rangeland Management Specialist for guidance.

The NRCS office in Guam may provide clients with published chemical control references from the University of Guam's Cooperative Extension Service-Agriculture and Natural Resources (ANR) Unit and the NRCS office in Saipan may provide clients with published chemical control references from the Northern Marianas College-Cooperative Research Extension and Education Service, if available. If no published recommendations are available, follow the published UH-CTAHR recommendations or contact a University Extension Specialist or the PIA State Rangeland Management Specialist for assistance.

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 injure humans, domestic animals, desirable plants, fish or other wildlife, and may contaminate water bodies, nearby crops or other vegetation. Follow the directions and heed all precautions on the container label. Landowners and applicators should be aware of and adhere to the provisions of state and federal laws and regulations concerning the use of agricultural chemicals. Open mixing of chemicals shall not occur in the application field within a minimum of 100 feet of a well or surface water body.

Conformance with permits of all state and federal regulations for use of chemicals shall be the responsibility of the cooperator. Permits for use of chemicals will specify legally required setbacks from watercourses, ponds, residences, etc. State issued licenses may be required when using chemical pesticide treatments.

Adjacent land uses must be considered before chemicals are used.

Where herbicides are used following mechanical control measures, timing and application method of treatment will be that which is known to be effective on the target species.

**Broadcast treatments** refer to the application of herbicides evenly across an entire area. The most common types of broadcast treatments use foliar sprays or soil-applied herbicides.

- **Foliar.** This method is the most common for applying herbicides. Applications can be made using hand sprayers, power sprayers or aircraft. In addition, wipe-on systems and very- and ultra-low volume applicators are available.
- **Soil Application.** Granular or pelleted herbicides are applied by hand, with a mechanical spreader or by aircraft. The herbicide is taken up by the plant roots. This method is particularly suited for brush control in remote areas or areas with rough terrain where hauling of spraying equipment and water is difficult.

**Individual Plant Treatment (IPT)** refers to treating each plant of the target species individually. Foliar sprays, and soil applications can both be applied using the IPT method.

- Individual Plant Treatment (IPT) has proven to be cost effective and much more effective than most broadcast treatments.
- Conservationists must consider the type of targeted species when selecting herbicidal IPT. IPT foliar treatments are most feasible on multiple stemmed plants less than 8 feet tall.
- Plant densities in terms of plants/acre rather than crown canopy should be used when determining whether or not to use IPT. As a general rule of thumb, densities of greater than 300 plants per acre should be controlled by means other than IPT. Plant size also influences the feasibility and cost of IPT.
- Research indicates that substantially less herbicide may be needed per acre when using IPT as opposed to standard broadcast methods. This makes IPT an environmentally sound choice as well as a more economically sound one.
- IPT has broadened the application window considerably. Foliar sprays often can be applied during most of the growing season.

### **Biological Treatment Methods**

Biological controls use living organisms (natural enemies) to suppress populations of weeds

Livestock are best used for follow-up treatments after mechanical control. The use of livestock should never be planned as the primary weed treatment unless the vegetation is already in a state that is accessible, safe and palatable for control by livestock.

### **MITIGATION PRACTICES**

Where risk analysis tools identify intermediate to high potential hazards to humans or fish, mitigation practices that serve to minimize those risks are required to ensure the protection of water resources.

Minimizing groundwater contamination by leaching of an herbicide or associated metabolites are those practices that reduce or eliminate exposure or infiltration. Examples of these practices include reduced rates, foliar applications, spot applications, alternative herbicides, and alternative controls.

Mitigation practices for limiting surface water contamination by runoff of an herbicide or associated metabolite (including runoff of soil adsorbed herbicides) are those practices that minimize water runoff and soil erosion.

Table 1 – “Mitigation Effectiveness Guide – Reducing Pesticide Impacts on Water Quality” may be helpful in identifying methods that will help to ensure minimization of potential problems.

### **OTHER DESIGN CONSIDERATIONS**

Producers will use the minimum level of herbaceous weed control necessary to meet their objectives for forage quantity, quality and accessibility.

Where tillage is used as a control application, the number, sequence, and timing shall be coordinated with other sediment-control tactics and practices in order to minimize sediment losses to nearby surface water bodies.

Critical scouting periods for Herbaceous Weed Treatment may be used as a guideline for scheduling on-site weed infestation investigations.

Producers should be aware of neighboring fields where organic production is practiced in an effort to minimize any potential adverse herbicide impacts on those crops and associated certification.

## **OPERATION AND MAINTENANCE**

### **Operation**

Operations shall be carried out in such a manner and sequence that erosion and air and water pollution are minimized and held within legal limits.

Success of the practice shall be determined by evaluating regrowth or reoccurrence of target species after sufficient time has passed to monitor the situation and gather reliable data. Length of evaluation periods will depend on the herbaceous weeds species being monitored, proximity of propagules (seeds, plant materials and roots) to the site, transport mode of seeds (wind or animals) and methods and materials used.

Herbaceous weed treatment practices shall be applied using approved materials and procedures. Operations will comply with all local, state, and federal laws and ordinances. Important operational procedures include:

- Read and follow label directions and maintain appropriate Material Safety Data Sheets (MSDS). MSDS and herbicide labels may be accessed on the Internet at: <http://www.greenbook.net/>
- Calibrate application equipment according to recommendations before each seasonal use and with each major chemical and site change.
- Replace worn nozzle tips, cracked hoses, and faulty gauges on spray equipment.
- Follow label requirements for mixing/loading setbacks from wells, intermittent streams and rivers, natural or impounded ponds and lakes, and reservoirs.
- Post signs, according to label directions and/or federal, state, tribal, and local laws, around fields that have been treated. Follow restricted entry intervals.
- Dispose of herbicide and herbicide containers in accordance with label directions and adhere to federal, state, tribal, and local regulations.
- Maintain records of plant management for at least two years. Herbicide application records shall be in accordance with USDA Agricultural Marketing Service's Pesticide Recordkeeping Program and state-specific requirements.

The owner, operator, contractor or other persons will conduct all work and operations in accordance with proper safety codes for the type of construction being performed with due regards to the safety of all persons and property.

### **Maintenance**

Following initial application, some regrowth, re-sprouting, or reoccurrence of herbaceous weeds should be expected. Spot treatment of individual plants or areas needing re-treatment should be completed as needed when weed vegetation is most vulnerable to desired treatment procedures.

Important maintenance procedures include:

- Reviewing and updating the plan periodically in order to:
- incorporate new control strategies and technology
- respond to grazing system and weed complex changes
- avoid the development of weed resistance

- Maintain mitigation techniques identified in the plan in order to ensure continued effectiveness
- Re-treat areas as needed to ensure control

## **SAFETY**

Landowners or operators, sponsoring organizations, and contractors shall be liable for damage to utilities and damage resulting from disruption of service caused by construction activities.

The Natural Resources Conservation Service makes no representation on the existence or non-existence of any utilities. Absence of utilities on the drawings is not assurance that no utilities are present at the site.

It is the responsibility of the landowner or operator to determine if there are buried or overhead utilities near the proposed work. They should take proper procedures to ensure that the utilities shall not be jeopardized and that equipment operators and others will not be injured during construction operations.

The operator will develop a safety plan for individuals exposed to chemicals, including telephone numbers and addresses of emergency treatment centers and the telephone number for the nearest poison control center.

- The National Pesticide Information Center (NPIC) telephone number in Corvallis, Oregon, may also be given for non-emergency information: **1-800-858-7384**
- The national Chemical Transportation Emergency Center (CHEMTRAC) telephone number is: 1-800- 424-9300

## **BASIS OF ACCEPTANCE**

The application of this practice shall conform to the details of this specification.

The completed job shall be workmanlike and present a good appearance. The contractor or participant shall conduct all work in accordance with proper safety procedures.

After the practice has been completed, a site inspection will be made to determine whether the practice was properly applied and adequate control has been achieved. A practice certification form will be completed by the planner.

## **REFERENCES**

Arnold, Harry L. 1968. *Poisonous Plants of Hawaii*. Charles E Tuttle Co.

Hirano, Robert T. 1983. *Handbook of Hawaiian Weeds* edited by E.L. Haselwood and G.G.

Leary, J., Beachy, J., and Hardman, A. 2012. *Practitioner's Guide for Effective Non-Restricted Herbicide Techniques to Control and Suppress Invasive Woody Species in Hawai'i*. University of Hawai'i, College of Tropical Agriculture and Human Resources. Available at: <http://www.ctahr.hawaii.edu/oc/freepubs/pdf/WC-10.pdf>. (Accessed 25 November 2014).

Motter, Darold L. Lyon Arboretum, University of Hawaii.

Motooka, P., Castro, L., Nelson, D., Nagai, G., and Ching, L. 2003. *Weeds of Hawai'i's Pastures and Natural Areas: An Identification and Management Guide*. Univ. of Hawaii, College of Tropical Agriculture and Human Resources. Available at <http://www.ctahr.hawaii.edu/invweed/weedsHi>. (Accessed 25 November 2014).

Hawai'i Pacific Weed Risk Assessment: <https://sites.google.com/site/weedriskassessment/>

Weed Risk Assessments for Hawaii and Pacific Islands: <http://www.botany.hawaii.edu/faculty/daehler/WRA> and <http://www.hear.org/pier/>.

**Table 1. Mitigation Effectiveness Guide – Reducing Herbicide Impacts on Water Quality**

*Note: This table identifies management techniques that have the potential to mitigate herbicide impacts on water quality. Not all techniques will be applicable to a given situation.*

*Relative effectiveness ratings by herbicide loss pathway are “no effect” (blank); “slight effect” (+/-); “moderate effect” (++)/—); and “significant effect” (+++/—). The table also identifies how the technique(s) functions. Effectiveness of any mitigation technique can be highly variable based on site conditions and design. Therefore, with guidance provided by the table, site-specific selection and design of mitigation technique(s) that are appropriate for identified resource concerns are left to the professional judgment of the conservation planner.*



Table 1

| PEST MANAGEMENT<br>MITIGATION<br>TECHNIQUES  | PESTICIDE LOSS PATHWAYS |                       |                       | FUNCTION  |
|--|-------------------------|-----------------------|-----------------------|---|
|  | LEACHING                | SOLUTION<br>RUNOFF    | ADSORBED<br>RUNOFF    |   |
| Application Timing   | +++                     | +++                   | +++                   | Reduces exposure potential-delaying application when significant rainfall events are forecast can reduce pesticide transport to ground and surface water, application when conditions are optimal can reduce the amount of pesticide applied, also delaying application when wind speed is not in accordance with label requirements can reduce pesticide drift to surface water. |
| Formulations/ Adjuvants  | ++                      | ++                    | +                     | Reduces exposure potential- formulations and/or adjuvants that increase efficacy allow lower application rates.   |
| Lower Application Rates  | +++                     | +++                   | +++                   | Reduces exposure potential-use lowest effective rate.   |
| Partial Treatment  | +++                     | +++                   | +++                   | Reduces exposure potential-spot treatment, banding and directed spraying reduce amount of pesticide applied.  |
| Pesticide Label<br>Environmental<br>Hazard Warnings and<br>BMPs  | Required <sup>1</sup>   | Required <sup>1</sup> | Required <sup>1</sup> | Reduces exposure potential-label guidance must be carefully followed for pesticide applications near water bodies and on soils that are intrinsically vulnerable to erosion, runoff, or leaching.   |
| Scouting and<br>Integrated Pest<br>Management (IPM)<br>Thresholds  | +++                     | +++                   | +++                   | Reduces exposure potential-reduces the amount of pesticide applied.   |
| Set-backs  | +                       | ++                    | +                     | Reduces exposure potential-reduced application area reduces amount of pesticide applied, can also reduce inadvertent pesticide application and drift to surface water.  |
| Substitution –<br><ul style="list-style-type: none"> <li>• Alternative pesticides</li> <li>• Cultural controls</li> <li>• Biological controls</li> </ul> | +++                     | +++                   | +++                   | Reduces hazard potential-use alternative pesticides with low environmental risk, substituting cultural (including burning and mechanical controls) and biological controls can reduce the need for pesticides.  |

<sup>1</sup> The herbicide label is the law-all herbicide label specifications must be carefully followed, including required mitigation. Additional mitigation may be needed to meet NRCS weed management requirements for identified resource concerns.



## **Specific Site Requirements**