

4.1 Brush Control/Management

Applicability

This BMP, where appropriately based on regional factors and site location characteristics, is a potential means of reducing evapotranspiration by brush species (such as ash juniper, mesquite, and salt cedar) in order to improve soil conservation, water quality and water yield. It is intended for use by agricultural producers in riparian areas or on upland areas (rangeland, native or naturalized pasture, pasture, and hay lands) where sufficient rainfall or water exists as determined by a feasibility study prepared by the Natural Resource Conservation Service (“NRCS”), the Texas State Soil and Water Conservation Board (“TSSWCB”), or the project manager. This BMP is intended for use with governmental cost-share programs.

Description

Brush Control/Management includes the removal, reduction or manipulation of non-herbaceous plants by mechanical methods, chemical treatment, biological methods, prescribed burning, or combinations of these methods to achieve the desired plant community. Prescribed grazing shall be applied to ensure desired response from the above treatments. Chemical treatments should be applied in accordance with NRCS and TSSWCB recommendations and in a manner consistent with the product label so as to protect water quality and non-target plant or animal species.

To be considered a water conservation BMP a Brush Control/Management project should:

- 1) Demonstrate water savings. The project should be able to provide probable and measurable water benefits, and the project manager should establish reasonable hydrologic goals considering local conditions before implementation.
- 2) Be cost-effective.
- 3) Be compatible with the natural soil profile and conditions. Excessive removal of brush or removal of brush in areas that have thin soil profiles or steep slopes can lead to severe erosion. This can negatively impact water quality downstream and remove important soil microorganisms from the site.
- 4) Be compatible with natural vegetation. Before removal of brush, a project manager should identify the vegetation appropriate for restoration of the area. A manager should assess whether or not the restoration can occur naturally or if it needs to be augmented with planting.
- 5) Maintain or promote affected wildlife. A properly designed brush management project can provide habitats for a variety of wildlife species, including endangered species.
- 6) Incorporate an effective maintenance plan. Maintenance of the brush management area is critical to ensure continuance of water production.

Implementation

A Brush Control/Management plan should be developed for each pasture, field, or management area where Brush Control/Management will be applied. The Brush Control/Management plan should include the following information:

- 1) Brush canopy or species count and percent canopy or number of target plants per acre.
- 2) Maps or drawings showing areas to be treated and areas to be left undisturbed.
- 3) For mechanical treatment methods:
 - a. Types of equipment to be used
 - b. Dates of treatment
 - c. Equipment operating instructions
 - d. Techniques or procedures to be followed
- 4) For chemical methods:
 - a. Herbicide name
 - b. Rate of application or spray volumes
 - c. Acceptable dates of application
 - d. Mixing instructions (if applicable)
 - e. Application techniques, timing considerations or other factors that must be considered to ensure safe, effective application, including available manufacturer's literature and/or instructions and NRCS or TSSWCD guidelines. The chemical will be used in a manner consistent with the product label so as to protect water quality and non-target plant or animal species.
- 5) For biological treatment methods:
 - a. Kind of biological agent or grazing animal to be used
 - b. Timing, duration and intensity of grazing or browsing
 - c. Desired degree of grazing or browsing used for control/management of the target species
 - d. Special precautions or requirements when using insects or plants as control/management agents

Brush Control/Management will be planned and applied in a manner to meet wildlife habitat requirements and consider wildlife concerns.

Schedule

Brush Control/Management projects are typically multi-year in scope to achieve initial removal levels and then require follow-up treatments every three to five years. A Brush Control/Management project can be scheduled over several years to reduce the cost of the project.

Scope

Brush Control/Management for water conservation is typically applicable to non-irrigated land in areas with sufficient rainfall, as determined by feasibility studies, for brush to become established and to present a problem or in riparian areas (land adjacent to water courses).

Documentation

To document this BMP, plans and specifications for each field scheduled for Brush Control/Management will be prepared and may include narratives, maps, and/or drawings. These documents may contain the following items:

- 1) Maps or aerial photographs of the field prior to brush treatment;
- 2) Maps or aerial photographs of the field one or more years after brush treatment;
- 3) Method used for Brush Control/Management and receipts for materials or contract work;
- 4) For chemical treatments, records should be kept of specific names and types of chemicals used, application rates, and total amounts used;
- 5) Estimates of the number of target plants per acre or percent canopy cover prior to treatment; and
- 6) Estimates of the number of target plants per acre or percent canopy cover one or more years after treatment.

Determination of Water Savings

Accurate determination of the quantity of water salvaged by Brush Control/Management requires expert analysis. In general, control/management of salt cedar in riparian areas has the potential to salvage significantly more water per acre treated than control/management of brush on uplands. However, there is significantly more land in Texas with brush infestation in upland areas as compared to riparian areas. The NRCS in cooperation with the Texas Agricultural Experiment Station through the TSSWCB reported that expected water yields for various levels of control/management of brush in upland areas range from 0.34 to 0.55 acre-feet per year per acre (net).¹ It was estimated that the annual amount of water salvaged from salt cedar control/management in riparian areas along the Pecos River in West Texas at 5 to 8 acre-feet per acre treated.²

Cost-Effectiveness Considerations

Texas A&M University at College Station, Department of Agricultural Economics, found that “present values of total upland brush control costs per acre range between \$35.57 and \$203.17” for a time period of ten years, and the cost of “added water” between \$14.83 and \$35.41 per acre-foot averaged for the same time period. The United States Natural Resources Conservation Service Environmental Quality Incentives Program for Texas provides partial funding for eligible mechanical brush control and management projects at rates per acre based on the “established county average cost of the practice”. The county average costs range from \$150 to \$200. It was reported that the cost for chemical treatment of salt cedars on the Pecos River in West Texas using aerial application of between \$183 and \$189 per acre and a resulting cost for the salvaged water of \$7.90 to \$8.22 per acre-foot using a conservative estimate of the

effective life of the treatment of 3 years.² The cost of salvaged water per acre-foot in other locations may be significantly different.

References for Additional Information

1. *Brush/Water Yield Feasibility Studies II*", USDA Natural Resources Conservation Office, Texas
2. Agricultural Experiment Station, USDA- Agricultural Research Service. Bednarz, S., *et al.*, no date.
3. *The Pecos River Ecosystem Progress Report*, Texas Cooperative Extension Service, http://farwest.tamu.edu/rangemgt/Saltcedar/2002_Progress_Reports.pdf, Hart, Charles, 2002.
4. *Assessing the Economic Feasibility of Brush Control to Enhance Off-Site Water Yield*, Department of Agricultural Economics, Texas A&M University, College Station. Dumke, L, *et al.*, no date.
5. *Conservation Practice Standard, Brush Management*, Natural Resources Conservation Service, April 1995, Code 314.
6. *Brush Management, "Myths and Facts"*, Environmental Defense, 2003, 17 p. Ball, Laura and Melinda Taylor.
7. Technical Resources, USDA-NRCS, www.nrcs.usda.gov/technical