

# Texas Agricultural Extension Service

*People Helping People*

## MANAGING BITTERWEED TO REDUCE SHEEP LOSSES

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Bitterweed poisoning of sheep remains a serious problem in some areas of Texas (illustrated by shaded area in figure 1). Herbicide use and livestock management can reduce animal losses.

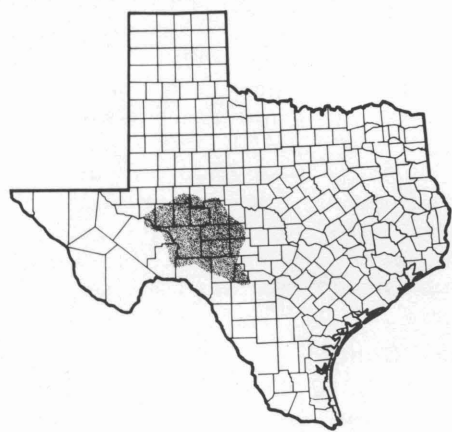


Figure 1. Bitterweed (*Hymenoxys odorata*) problem area in Texas.



Figure 2. Mature plant of bitterweed in early summer showing finely divided leaves and flower heads with toothed rays.

### Bitterweed

An annual, cool-season plant of the sunflower (composite) family, bitterweed (*Hymenoxys odorata* DC) grows in dense stands on the Edwards Plateau and Trans-Pecos areas of Texas. Individual plants are tightly rounded clusters ranging in height from a few inches to 2 feet (figure 2). Numerous bright yellow ray and disk flowers appear from early spring to summer. Dozens, often hundreds of flower heads, each producing 50 to 75 seeds, may grow on each plant. Plants germinate in late fall and winter, especially during wetter-than-average years on limestone-derived soils and on mechanically disturbed or overgrazed areas. Leaves are finely divided. The plant tastes bitter and has a strong aromatic odor when crushed.

### Signs of Poisoning

Sheep with acute or chronic poisoning stop eating, salivate, vomit, become depressed and weak and lie down most of the time. A green salivary discharge and stain around the muzzle is common. Affected animals often lag behind the flock and may stand with backs arched.

Ingestion of fresh bitterweed equivalent to approximately 1.3 percent of an animal's weight was lethal in controlled feeding studies; but, only one-half this amount is required when bitterweed develops under drought conditions. Recent field studies suggest that sheep grazing under natural conditions can tolerate much more than 1.3 percent of their body weight of bitterweed. If removed from a source of bitterweed at the onset of poisoning, sheep may recover in 7 to 10 days. Cattle and goats also are susceptible but rarely are actually poisoned. The toxic principal is a sesquiterpene lactone called hymenoxon.

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## Control by Management

The following list includes management techniques to use in controlling bitterweed poisoning.

- Rotation and proper grazing levels
- Flash grazing of bitterweed at critical times
- Keeping animals out of bitterweed problem areas
- Drylot feeding of animals during bitterweed season
- Combinations of livestock
- Supplemental feeding

Bitterweed poisoning can be reduced or stopped by managing grazing through rotation and proper stocking. Pasture deferment, for example, increases vigor of grasses and forbs that compete with bitterweed.

Flash grazing by sheep, that is, turning many sheep into a pasture with bitterweed for a few days and removing them before poisoning, may reduce bitterweed vigor and allow desirable plants to predominate. Several ranchers have avoided toxicity by shifting sheep from bitterweed-infested pastures to bitterweed-free pastures in 7-day cycles.

Poisoned sheep usually recover after 10 days on alfalfa hay. Drylot feeding with alfalfa or peanut hay may be a temporary alternative when bitterweed-free pastures are not available.

Combining cattle, sheep and goats at moderate stocking rates greatly reduces and may eliminate losses compared with sheep alone on heavily stocked pastures. A four-pasture deferred rotation system grazed moderately with cattle, sheep and goats was established by the Texas A&M University Agricultural Experiment Station at Sonora in 1949. Despite heavy stands of bitterweed, no sheep have died from poisoning on these rotation pastures for more than 30 years, whereas annual losses on pastures heavily grazed with sheep alone have averaged 8 percent. There were no losses on lightly grazed pastures stocked with cattle, sheep and goats. Similar systems and stocking at the Texas Range Station at Barnhart have reduced, but not eliminated, death losses from bitterweed.

Ranchers have consistently observed that feeding supplemental protein aggravates bitterweed problems. This observation is supported by the fact that high protein diets are detrimental in situations where there is impairment of kidney and liver functions, which occurs in bitterweed poisoning. The problem would be even more severe if a portion of the protein in the supplement were derived from a nonprotein nitrogen source, such as urea. Because of

this, use supplemental feed providing energy and moderate levels of natural protein before the time sheep start eating bitterweed. Definitely do not give supplemental feeds containing urea to sheep exposed to bitterweed, and high protein supplements should probably not be fed to sheep already poisoned on bitterweed.

## Control with Herbicides

To control bitterweed with herbicides, consider the three items listed below.

- Spray before flowering
- Spray before dense stands are established
- Consider temperature and soil moisture

Bitterweed control with herbicide sprays depends on air and soil temperatures, soil moisture, stage of plant growth and herbicide type. Control before flowering has been successful with the ester or amine formulation of 2,4-D at rates of 1 pound acid equivalent per acre when temperatures and soil moisture favor bitterweed growth. For this traditional method air temperatures should be above 72° F. with 20 to 25 percent soil moisture in clay soils. When air temperatures are less than 60° F. or when three-fourths of the plants are blooming, control bitterweed with 2,4-D plus dicamba (3:1), picloram, 2,4-D plus picloram (4:1) or 2,4,5-T plus picloram. Forbs important in livestock diets, including tallow weed, filaree, nuttall milkvetch and croton, are also controlled or suppressed by the herbicides.

## Integrated Control

Use herbicides to prevent localized infestations of bitterweed from spreading and to maintain bitterweed-free pastures where animals can be held during critical bitterweed periods.

Manually clearing small patches and isolated plants is useful, although expensive on a large scale.

Removing plants may be necessary for many years before the viable seed reserve in the soil is depleted. Avoid disturbing soil with machinery or excessive hoof action of grazing animals. Avoid spreading seeds into bitterweed-free areas on tires and undercarriages of vehicles or equipment.

Because bitterweed grows from seed during cool, moist periods, it does not compete successfully within good stands of vigorous perennial plants under proper grazing management. Long-term control depends on the vigor of desirable range grasses and forbs encouraged through deferment and proper stocking rates with combinations of livestock.

## Acknowledgment

The authors greatly acknowledge the assistance of C.J. Scifres, Leo B. Merrill and M.C. Calhoun, professor, retired professor and associate professor, Texas Agricultural Experiment Station, College Station, Sonora and San Angelo, respectively, The Texas A&M University System.

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Issued in furtherance of Cooperative Extension Work in Agriculture and Home Economics, Acts of Congress of May 8, 1914, as amended, and June 30, 1914, in cooperation with the United State Department of Agriculture. Zerle L. Carpenter, Director, Texas Agricultural Extension Service, The Texas A&M University System.