FACT SHEET

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# ECOLOGY AND CONTROL OF GOLDENWEEDS

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More than 93 percent of the rangeland in the Rio Grande Plains of Texas is currently brush infested. Some sites support a complex of 15 or more woody species. Brush and weeds compete with desirable grasses and broadleaved plants for light, water, nutrients and living space. However, many brush and weed species also contribute to the welfare of domestic and wild animals. Consequently, well-planned brush management programs should consider the usefulness as well as the potential negative effects of these plants. Chemical and mechanical methods and fire are useful tools for brush and weed control, but a well-developed livestock grazing management program is necessary for long-term range improvement.

Goldenweeds (*Isocoma sp.*) demand the attention of ranchers as locally important weed species. Although once considered a minor component of the vegetation, goldenweeds have, in recent decades, increased in abundance and density on rangeland and improved pastures in South Texas. These subshrubs pose a significant weed problem on several million acres in the area, especially where brush has been removed mechanically. Goldenweeds sometimes occur as scattered individuals in the understory of woody plant communities. However, with removal of the brush cover and resultant soil disturbance, goldenweeds often develop dense stands and dominate range sites of moderate to high potential productivity (figure 1). Stands of 3,000 plants per acre commonly occur.

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*Figure 1. Dense stands of more than 3,000 goldenweed plants per acre are common.*

## DESCRIPTION AND RANGE

Two species of goldenweed — common and Drummond's — grow in South Texas. Both are many-branched perennial subshrubs with rounded canopies (figure 2). They average 2 to 3 feet in height, and the branches grow from a woody base. The resinous leaves are about 1 inch long, aromatic and vary in shape from simple and linear to toothed or even compound.

Bright yellow flowers develop in late fall. They may occur singly or in clusters, with as many as 20 at the stem tips. Seeds are small, hairy and bristled. A large plant may produce as many as 200,000 seeds per year. These germinate in the spring, and seedling



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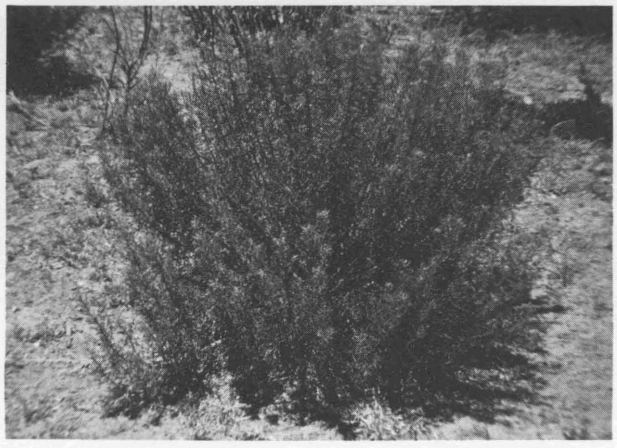

*Figure 2. Goldenweeds are many-branched perennial subshrubs with rounded canopies.*

densities can exceed 2,600 plants per square yard. However, seedling mortality may range from 25 percent to 100 percent depending on site and precipitation during the first year. Once established, a goldenweed plant may live for more than 10 years.

Drummond's goldenweed occurs mainly in a narrow band along the Coastal Prairie (figure 3). Common goldenweed inhabits the Rio Grande Plain north and west to Maverick and Kinney counties.

Goldenweeds are well adapted to a wide variety of soil types and range sites in South Texas. However, Drummond's goldenweed may not tolerate as broad a range of environmental conditions as does common goldenweed. The former is best adapted to well-drained, non-saline, calcareous sandy loams. Common goldenweed is more abundant on clay and clay loam soils.

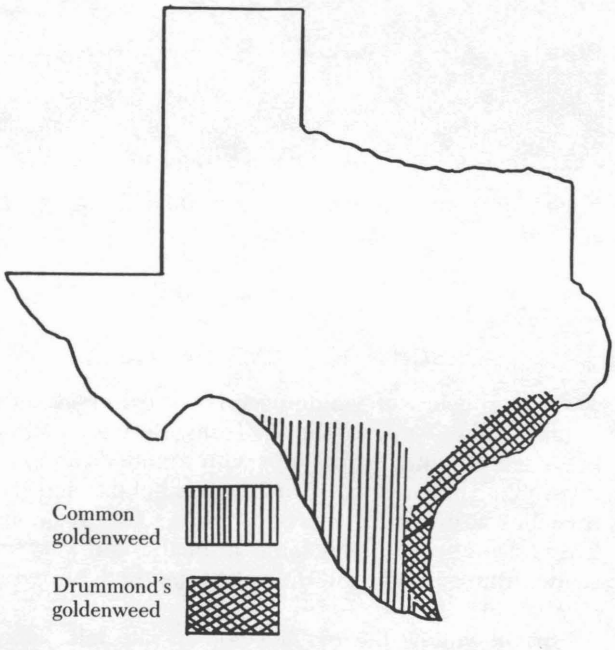


*Figure 3. General distribution of the Drummond's and common goldenweed in South Texas. A related species, rayless goldenrod, grows in West Texas.*

Both species apparently contain trementol, a compound poisonous to animals. Young animals may be affected through their mother's milk. Symptoms include trembling, depression and inactivity. Constipation, vomiting and quickened and labored respiration occur a short time before death. The only treatment for poisoned animals is to remove them from goldenweed-infested pastures. Fortunately, goldenweeds are not usually browsed by either livestock or deer, and few cases of poisoning are documented. A close relative, rayless goldenrod, annually causes significant livestock losses in West Texas.

## SUPPRESSION AND CONTROL

### Foliar Sprays

The extent of control obtained with herbicide sprays presently available for range improvement apparently is dictated by growth conditions, especially soil moisture, before and at the time of treatment. Rainfall peaks in South Texas normally occur in the spring and in late summer or early fall. This rainfall stimulates new vegetative growth in goldenweeds. However, the fall growth period is short, followed by flowering. The spring growth period is longer and more dependable for herbicide control measures.

Following acceptable growing conditions, 2 pounds of 2,4-D low volatile ester per acre effectively control goldenweeds. Adding dicamba to 2,4-D results in improved control when environmental conditions are less than optimal. A commercial formulation or a tank mix of 3:1 ratio of 2,4-D and dicamba, applied at 1.5 pounds per acre, is effective.

It is desirable to apply 2,4,5-T or a mixture of 2,4,5-T and picloram if mixed woody species or cactus are present. A 1:1 mixture of 2,4,5-T and picloram applied at 1 pound per acre gives more complete control of a variety of woody species, pricklypear and goldenweed.

Apply ground broadcast sprays using at least 20 gallons of spray solution (water and herbicide) per acre. Aerial broadcast applications should use at least 4 gallons total spray solution per acre. The carrier can be water or a 1:3 diesel oil-water emulsion. Herbicide uptake by the leaves is enhanced by the addition of a surfactant. In all herbicide mixtures, 8 to 32 ounces of surfactant per 100 gallons are sufficient.

### Mechanical Methods

Many goldenweed infestations may be the result of a mechanical treatment such as rootplowing, chaining or disking. Soil disturbance caused by these practices, when followed by effective rainfall, provides an ideal seedbed for goldenweed invasion, and removing the brush reduces competition with the goldenweeds. In areas with nearby susceptible crops or in small,

rough pastures, herbicide applications may not be safe or practical. In these areas, an effective mechanical control method may be the best alternative.

Shallow rootplowing or deep disking effectively controls goldenweeds if the timing of treatment is right. Treat during a hot, dry part of the year (July-August). Uproot the plants and allow them to dry. Seedling mortality is high under summer conditions, and seeds generally do not survive more than 12 months.

Shredding is ineffective because new stems develop from the remaining stems when top growth is removed. Goldenweed top growth often is increased by this practice. Chaining has the same effect as shredding.

### Prescribed Fire

Prescribed burning has been used to reduce goldenweed top growth and to kill 30 percent to 40 percent of the plants. Vigor and growth of surviving plants usually are reduced for 2 years following such treatment. The effectiveness of fire is very dependent upon the amount of fine fuel (usually grass) at the time of the burn. Usually, sufficient fine fuel to carry a fire is not present when a goldenweed stand is dense. Thus, initially reduce the stand with some other control method. Fire can then be used as a maintenance tool. Fire may suppress goldenweed effectively if used during the early stages of goldenweed invasion of a pasture, before the grass cover is suppressed significantly.

### Forage Responses

Removing a goldenweed stand results in more soil moisture and nutrients becoming available for desirable plants, with a subsequent increase in forage production. However, effectiveness of control treatments, subsequent rainfall and follow-up grazing management contribute to the amount of forage response that may be expected.

### Management Implications

Dense stands of goldenweed significantly decrease forage production. Effective control measures allow the growth of desirable plants for livestock and wildlife use. Rest pastures from grazing following goldenweed control to allow grasses to grow and regain vigor. A well-planned grazing system with proper stocking enhances forage response after goldenweed control. Periodic maintenance control efforts may be necessary to prevent reinfestation of goldenweed.

## ADDITIONAL READING


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