

**“Range Weed Control; During and After Drought”**

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**INTRODUCTION**

Drought is a common occurrence for South Dakota beef producers. The variation in weed control that ranchers need to manage for is the intensity and duration of the rainfall shortages. The common problem however, is what happens when grass and forbs become stressed and the changes to the vegetation that occurs. Stresses or disturbances that cause the grasses to slow growth and open up bare areas can include several situations; over grazing, flooding, wild fires, severe hail, growing season freeze, soil disturbances (prairie dogs or pocket gophers), and drought.

Weeds are very opportunistic and competitive and will readily invade bare areas of ground that are created by these conditions. Once established weeds will aggressively compete for light, nutrients, moisture and space. This will allow for quick weed establishment and when more favorable conditions occur, weeds will spread to new areas and weed densities will increase.

Weeds can be divided into three growth categories; 1. Annuals, 2. Biennials, and 3. Perennials. Within these groups they can further be categorized as cool season or warm season plants or as a broadleaf, grass or sedge plants. The plants we tend to be more concerned with during or following drought are the broadleaf weeds. The broadleaf weeds that cause the biggest problems are those introduced or invasive plants that have gotten a foothold here. In South Dakota the invasive weeds of major emphasis for grasslands include Canada thistle, leafy spurge, hoary cress, the knapweeds, biennial thistles (musk, plumeless, bull and scotch), the toadflaxes, field bindweed, absinth wormwood and common mullein. All of these and others are on South Dakota’s state wide and locally noxious lists. They are considered regulated pests in the state.

Another group of plants that can take advantage of drought and become a problem in range settings is some native forbs like the vervains, common sunflower, horseweed or marestalk, golden rod family, perennial ragweed and cudweed sagewort. In normal conditions these plants are not considered invasive. They can have good forage value at certain growth stages. This can reduce grazing pressure on desirable grass species recovering from drought.

These plants can also provide for ground cover, soil benefits and be an asset for insects (pollinators), birds, and other wildlife.

### **DROUGHT AFFECTS ON SPECIFIC WEEDS, GRASSES AND BENEFICIAL FORBS**

Drought affects all plants because they need water to grow and reproduce. But because there are differences among species such as leaf structure, cuticle thickness, root depth and type, and maturity or growth type, some plants have more tolerance to drought.

Grass responses to drought and recovery from drought will vary by species. Western Wheatgrass, for example has good drought tolerance.

Deep rooted perennial weeds like Canada thistle, leafy spurge, and Russian knapweed are capable of utilizing water deeper in the soil profile. These plants are also able to store more carbohydrates in their roots and keep them in reserve through drought periods. This allows them to utilize the carbohydrates for quick growth during the drought recovery period giving them the competitive edge over many of the perennial grasses with amore fibrous root system.

Some plants will become dormant during extreme heat and drought, and can respond to rains early in the drought recovery cycle. Examples of these weeds include hoary cress and common mullein. The fast growth rates of these weeds give them the competitive advantage to perennial grasses. Common mullein normally is not competitive with range grasses but to compensate for this it can produce thousands of seeds per plant and the seed can remain viable in the soil for very long periods of time. Following a drought period that seed will germinate and take over the area of the drought affected plants.

When plants are growing in a droughty environment, the hot, dry conditions trigger responses in the plant. Plants that are grown under drought stress often develop thicker leaf cuticles. The leaf cuticle is a waxy coating on the leaf surface. This keeps plants from having rapid water loss and can reflect light keeping leaf temperature from becoming too high. Leaf hairs (pubescence) can also reflect light and reduce water loss. Drought tolerant plants also tend to have smaller leaves with less leaf surface area.

Drought plays a role in the soil seed bank and viability. Dry soil conditions can prolong the weed seed longevity. Seeds can remain viable because fungi and bacteria that attack and breakdown seeds need moisture to grow. Herbicide treatments applied to weeds during drought conditions tend to be less affective. Penetration of the herbicide through the thicker leaf cuticles can be difficult. Absorption of some herbicides can be improved under drought conditions with the addition of a good surfactant. Always be sure to follow product labels and recommendations when using and additives.

Stressed weeds due to drought can also slow and restrict herbicide translocation in the plant. Good control of perennial weeds is a very critical consideration for herbicide application success.

## **MANAGEMENT OF TOUGH WEEDS DURING AND AFTER DROUGHT**

The best defense against weeds in rangeland is good grazing management which keeps the grass at a competitive advantage. A healthy grass stand is your best and cheapest weed control option.

The main emphasis in a pasture during and after a drought should be the recuperation of the healthy grass stand. However, even in the best situations weeds will try to invade so monitoring or scouting pastures is needed. Keeping track of weed infestations and having good maps and records makes long term weed control more successful. Proper identification of the weeds is critical to put together a weed management in good moisture years as well as drought years. Records of past weed infestations will give the producer an advantage in having weeds re-infesting problem sites in a pasture after a drought. Sites that once were troubled with weeds may re-infest following a drought because of the dormant seed bank.

Control weeds as soon as you see them following a drought. Control weeds at the recommended stages for annuals, biennials or perennials. Do not let the weeds reach seed maturity. Prevent spreading seed to new areas or adding to the seed bank. If you allow livestock to graze weeds be sure to do so before the plant produces viable seed. Monitor areas of the pasture for weeds that may have high livestock pressure, such as corners, feeding sites, around stock tanks and ponds. Know what the plant is. Have it identified if you don't recognize it. Do not assume it is safe for livestock to graze, especially if there is an abundance in an area of the pasture. Poisonous or toxic plants may be quick to respond from a drought period and with limited forage available livestock may be tempted to eat it in the early spring. If there are areas with highly toxic plants it may be wise to keep livestock off that area until later in the season and control the plants if they are at the correct stage of growth.

If the plants or weeds are nontoxic and a potential source of livestock grazing, make efficient use of them during the growing season. This can provide desirable vegetation and advantage while still stressed from the drought. Be sure to keep your stocking rates adjusted to a level that allows the desirable vegetation a chance to rebuild their roots and increases over all plant vigor.

## **WEED CONTROL OPTIONS**

An affective weed control plan for pasture and range involves several management practices. The grazing scheme takes into account the type of livestock as well as the grass and forb species available. Grazing intensity influences the relative abundance of undesirable forbs and grasses. Weeds that are unpalatable when mature may provide acceptable grazing for certain classes of livestock when weeds are young. Grazing schedules are a good IPM practice for weed management. Cultural or mechanical weed management includes mowing or clipping, hand digging, prescribed burning, or cultivation. Other IPM

tactics include biological control, especially for noxious weeds. Herbicides are an aid to control unwanted weeds.

Mowing or clipping temporarily removes weed top growth but also removes top growth from grass. This system stops seed production but has different effects on the weeds. Annual forbs can be controlled by cutting below the lowest leaf early in the growing season. Undesirable annual grasses should be mowed after the seed stalk has elongated but prior to seed formation. Usually mowing perennial weeds one time reduces seed production; repeated mowing reduces vigor and slows spread. Clipping perennials like Canada thistle or leafy spurge in the spring works well as a set up for fall herbicides when moisture encourages new growth. Digging or chopping works well for scattered biennial thistle. Musk thistle rosettes can be stopped when the root is cut several inches below ground level. This requires more labor and is limited to small patches or scattered plants.

Burning is a valuable tool for managing weeds and grasses in range. Most annual broadleaf weeds and grasses and many undesirable perennial broadleaves can be controlled with fire. Forb response to fire depends on the timing of the burn. Burning in late spring when the plants are actively growing is the best time to control most perennial forbs. Biennial weeds that are in the rosette stage are not controlled by fire.

Biological control is another weed control tool, especially for noxious weeds. Biological control utilizes natural enemies as a means of weakening or killing the host plant. Insects have been the most common approach to biological control in South Dakota. Noxious weeds that have approved biological control agents (insects) in the state include leafy spurge, musk thistle, Canada thistle, toadflax, and biennial knapweeds. South Dakota currently has a collection and release program for leafy spurge flea beetles (*Aphthona* species), coordinated by the South Dakota department of Agriculture. The county weed and pest board is the local contact point for landowners and managers considering the use of flea beetles on leafy spurge.

Herbicide options are available to control many of the undesirable plants found in pasture and range. Many of these treatments, especially those targeting broadleaf weeds, will also remove all or many of the desirable forbs or legumes. Reducing or eliminating beneficial forbs can reduce livestock gains and alter the forage mix.

Herbicides perform best if conditions are favorable for plant growth. Curly cup gumweed is a good example. Gumweed is quite drought tolerant. It can form solid stands where it is given the opportunity such as in overgrazed pastures. Gumweed can be treated in early to mid- June with a number of herbicide options with excellent results. However delay the treatment for one month and control results are nearly zero for the mature plants. Careful and selective use of herbicides, combined with proper grazing management and other control tactics hasten recovery of weed infested pastures or range. Use herbicides that are labeled for the target weed and registered for use on pasture and range. Follow all grazing and haying intervals and environmental restrictions.

Deferred grazing gives the grasses an opportunity to build up root reserves, develop more top growth and produce more herbage. In some pastures, desirable native species no longer abundant will become re-established during the rest period. Deferred grazing can be used in conjunction with other improvement practices to speed recovery. For a more complete listing of herbicide recommendations refer to SDSU Fact Sheet, “Pasture and Range Weed Control”.

#### **REFERENCES:**

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