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Colorado GLCI Technical Note 5

Colorado Grazing Lands Conservation Initiative

Managing Weeds in Drought

Combating Weeds in Healthy Pastures

The management of noxious weeds in grazing lands focuses on two principles: don't let weeds get established; when they do get started, eradicate them while they are still small acute populations. Healthy native plant communities resist infestation by noxious weeds if healthy, vigorous and properly managed.

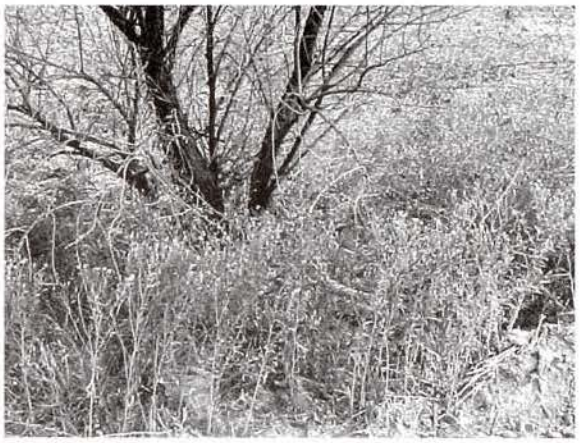
Properly managed grazing, careful monitoring and working with the natural plant community cycles can dramatically reduce the likelihood of weed infestation.

Prompt action taken against new weeds will require certain investments, but has been documented to be only a fraction of the cost incurred if weeds become well-established.

Integrated Weed Management

Responsible grazing lands managers utilize Integrated Weed Management or "IRM" to manage weeds. IRM is the practice of utilizing combinations of cultural, biological and chemical methods to effectively manage weeds. The emphasis is to prevent or limit ecological impact while incurring the smallest financial and manpower investments and the largest level of weed control.

In all cases, it is crucial to understand a specific weed's growth pattern and physiology. After a manager carefully identifies a weed problem, relates it to the native plant community, and reviews the alternatives for management, a combination of cultural, biological, and chemical methods can be effective and economical. Needless to say most managers are looking for better ways to manage chronic weed infestations.



Cultural management techniques involve physical disturbances to a noxious weed's growth cycle. Such practices might include mowing newly established weeds, prescribed grazing to remove seed heads and prevent spread, or prescribed burning if the weed species is not fire propagated. Hand pulling weeds is a "cultural" practice.

Biological management techniques usually refer to exposing weed populations to an insect, animal or other plant that either directly preys on the weed or vigorously competes with the weed for space, nutrients, and water. In situations where specific animals prefer to eat the weeds and leave desirable plants alone, such as goats grazing Leafy Spurge, both cultural and biological methods are in place at the same time.

Chemical methods usually involve the application of herbicides onto a weed infestation. In a few instances the application of fertilizer can enhance competition with weeds. The use of "weed & feed" on lawns is this type of chemical control practice. Following herbicide label instructions is crucial to reduce risk of problems and enhance the effectiveness of chemical methods.

Drought Sets Back All Management

Colorado has experienced an extended period of drought conditions that has challenged the integrity of all grazing lands and managers in the state.

The extended stress on native and introduced grassland species has harshly impacted desirable plant communities during a period when the fiscal resources of grazing lands managers are also greatly diminished.

Plant community losses have been documented across Colorado that had never before been documented, especially on such a state-wide scale. These impacts created "open space" between desirable plants that lay barren until moisture events came back to Colorado. And then those open spaces served as a platform for species to upsurge into prominence, many of them noxious weeds.

It is intuitive to most grasslands managers that the economic resources are far overwhelmed by the need to control weeds on the landscape. If something is not implemented the condition (and productivity) of Colorado grazing lands will diminish with the spread of weed infestations.

A Weed Management Approach for Grazing Lands in Colorado (Post – Drought)

Since many grassland managers were "de-stocked" to protect the integrity of Colorado grazing lands, their earning power and budget was reduced to almost nothing eliminating resources for weed control. Any implementation must be practical and economical.

To allow time for managers to regain management ability it is recommended that they:

- Identify and learn about the weeds on pastures.
- Contain those infestations that are large, chronic, or beyond means.
- Eradicate those infestations that are new, small, acutely noxious weeds, or in crucial sites such as riparian areas.
- Plan for the next phase to further control existing infestations.
- Carefully manage existing pastures to prevent further opportunity for weed infestation.

Evaluating the Cost of Weed Management

Managers always begin by looking at the cost of introducing beneficial insects, using herbicides or conducting "prescribed" grazing on weeds. In reality, we should begin by assessing the impact on productivity since pre-drought periods and then evaluate the impacts of NOT managing weeds.

If you have a 1,000 acre pasture that supports 800 Animal Unit Months, ($15/AUM) it generates $12,000 of value each year (gross – not net).

The drought impacts reduced productivity to 240 Animal Unit Months or $3,600 per year – a loss of $8,400 in value.

Weed infestations, left unmanaged, could easily reduce productivity by another 20% each consecutive year resulting in an additional loss of $720. Within five years the grazing value of the site could be $0.00.

Under this scenario any investment less than the total loss ($12,000/5 = $2,400) may be something to consider, especially since effective management brings income gradually back up and offsets the investment.

No matter what combination of IRM you implement – it's going to cost.

Herbicide Applications on Grazing Lands

Since net income on range or grazing lands usually equates to about $50-80 per acre, applying herbicides is often the last option for managers. Most choose to evaluate biological and cultural processes first since those are less costly. Some may incur little more than manpower, while others involve fuel, equipment or fencing costs.

Pasture Herbicide Comparison

The use of pesticides on pastures is only feasible if the cost of the methodology is equal to or less than the benefit of weed control. On a short-term basis this is often not the case, but on a long term basis herbicide application can be extremely cost-efficient.

First, lets look at the cost differences in a few of the popular rangeland herbicides so you can learn to evaluate "cost per acre".

Herbicide	Amt/acre	$/gallon	$/acre
2,4D	1 pt/ac	$10.80/gal	$2.70/ac
Curtail	2 qt/ac	$41/gal	$20/ac
Grazon	2 pt/ac	$28/gal	$7/ac
Tordon	1 pt/ac	$88/gal	$11/ac
Banvel	1 pt/ac	$79/gal	$10/ac
Crossbow	2 qt/ac	$51/gal	$26/ac

(These products and prices are examples and not officially sanctioned by the Colorado GLCI.)

If a manager only had to look at economics, the choices made for herbicides would be easy, but each management tool has different characteristics that have bearing on your pasture operation. For instance, please review the characteristics of the same products mentioned above.

Product	Timing	Residue	Grass Impact	Permit
2,4D	Post-emerg	No	No	No
Curtail	Post-emerg	Low	Low	No
Grazon	Post-emerg	Low	No	Yes
Tordon	Post-emerg	Low	Low	Yes
Banvel	Pre-emerg	Yes	Yes	Yes
Crossbow	Post-emerg	Low	Low	No

There are always other issues like leaching. Many herbicides can runoff or leach into water that travel to other crops and plants, or worse. Applying herbicides carefully according to the label is a good safeguard. **IF IT IS NOT LABELED FOR PASTURE USE – DO NOT USE IT!!**

Consideration Factors With Herbicides

A number of issues should be considered before selecting and applying an herbicide:

- Is the herbicide right for my pasture?
- Is it a Restricted Use Pesticide (RUP) that requires a license?
- Do I have the equipment, training and knowledge to apply it correctly?
- Does it leach into water?
- Does it require a surfactant to work?
- Does it impact desirable plants?
- Does it harm beneficial insects?
- Is it cost-effective for me?
- Is it available in the local area?
- Will it freeze?
- Is it easy and safe to store?
- Is it poisonous?
- Do I need to exclude all animals and humans from the area? How long?
- Does it leave a residue? Is this beneficial?
- Do I apply it before, during or after weed growth?
- What size containers can I get it in?
- Am I buying a "brand name" or can I get the same thing cheaper under a different name?
- What action does this chemical take that makes it work?
- Are there special precautions?
- Can I get the same weed control without using an herbicide?

The last question asked should possibly be your first question to focus on. Integrated Weed Management encourages the use of cultural and biological controls as your first step before chemical controls are utilized.

LEARN AND BE ABLE TO IDENTIFY THE SYMPTOMS OF PESTICIDE POISONING. KEEP THE MSDS SHEET and Poison Control Center number handy.

Licensing for Herbicide Application

It is recommended that all citizens planning to use herbicides acquire a Private Applicators License from the Environmental Protection Agency. The process of studying for and taking this free test provides valuable education on safe and effective herbicide use.

A test packet can be picked up at most Colorado State University Cooperative Extension offices throughout the state and the booklet is self-explanatory. The booklet and process are free of cost.

Higher levels of certification are necessary and available if your wish to apply herbicide for others, for a business, or as part of your job. These levels are more extensive and require fees.

In addition to licensing, it always helps to have some ready reference. An excellent resource is the CSU Colorado Weed Management Guide (Publication XCM-205) available at www.ext.colostate.edu.

Herbicide Resistance

Many weeds will develop a resistance to a specific herbicide, especially if the initial application was not implemented correctly.

It may be necessary to vary which herbicides, biological, and cultural methods are used. It's advisable to research the weed species you are working with to determine treatment.

Multi-Species Grazing

Since different species have a different grazing tolerances, habits, and physiology, it is possible to use these characteristics to manage specific weeds.

If forced to concentrate on one patch of pasture, animals will eat and impact weeds such as thistles, leafy spurge, salt cedar, and other weeds.

You must be careful that the weed targeted is both non-toxic and of value for the specific grazing species. Goats and sheep seem to be more tolerant to a wider range of weed use, but are not able to use all plants.

When using grazing animals to target weeds we must also be very cautious to identify and avoid intense grazing in areas where poisonous plants are present. Often poisonous plants spread into "open ground" created during drought impacts on rangelands.

Applying Herbicides on Rangelands

Many rangelands (pastures) are rougher terrain than cultivated fields. Since the "going" is rougher and often larger, special consideration must be given to the equipment type and investment cost.

Range and pasture herbicide application often puts stress on equipment and operators. Risk of "drift" with liquid herbicides places an emphasis on the use of dry formulation herbicides on rangeland. This emphasis includes using low volume herbicides and if at all possible use cultural and biological techniques rather than driving 20-30' swaths across your pastures.

Acute vs. Chronic Infestations

Weed managers differentiate weed infestations into two basic categories, "acute" and "chronic".

"Acute" infestations are fairly new weed incursions of small acreage size, huge potential for expansion and a weed species that has noxious potential. The encouraged approach is to eradicate these infestations with extreme malice.

"Chronic" infestations are well-established and usually include large acreage that has exceeded the economic response potential of a manager. These large weed areas need to be "contained". If at all possible treat the outer boundaries of the infestation and start "shrinking" the size of the infestations. It is important to identify newly seeded "spot infestations" which start from the seed bank of the large initial infestation.

POST-DROUGHT WEED GUIDELINES

- IDENTIFY WEEDS
- ADDRESS WEEDS
- USE INTEGRATED METHODS
- BE PRACTICAL
- DO YOUR HOMEWORK