

Newsletter



COLORADO STATE UNIVERSITY
EXTENSION



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HOW TO INTEGRATE MOWING INTO WEED MANAGEMENT PLANS?

By Bonface Manono, Small Acreage Management Specialist, Mountain Region

Mowing can offer a cheap mechanical weed management option that suppresses weed growth with minimal soil disturbance. If integrated with other weed management options, it can discourage undesirable plant succession by preventing them from producing seeds. However, this is not possible for plants propagated by vegetative structures such as rhizomes, stolons, tubers and bulbs.

HOW DOES MOWING AFFECT PLANT GROWTH?

When plants are mowed, they lose their leaves, the plant organs that manufacture food. This not only impacts on the plant shoot vigor, but also affects plant growth, delaying flowering and seed production. Further, mowing alters the surrounding soil conditions (soil moisture, temperature and light), making it either conducive or unconducive for undesired plant species. Some plants may regrow while others die at different rates, a strategy that can be used to manipulate a plant community to favor a desired plant.

FACTORS TO CONSIDER DURING MOWING FOR WEED MANAGEMENT

1. TIME OF MOWING

Timing is critical, for example, you should mow before viable seeds form and should precede anthesis, pollination and fertilization. Note that, some viable seeds can form after the plant has been mowed, such as in musk thistle, therefore you should properly dispose of the cut flowering plants. You should avoid mowing when seeds have already set to prevent weed reinfestation, increase and dispersal. You should also clean your mower to prevent transporting weed seeds on mower parts.



2. MOWING HEIGHT

Since blades must be low enough to cut off developing seed heads, ensure that your initial mowing is higher than subsequent mowing. This will prevent mowing misses in case later forming seeds develop so close to the ground. An example is the new stems that sprout below the cut in horseweed that may be managed by cutting high at the initial mowing and lower at the next mowing.

3. PLANT LIFE CYCLE



Perennial weeds are often managed by herbicides and/or tillage. However, herbicide dependence encourages the development and spread of herbicide-resistant weeds while tillage increases the risk of soil erosion.

The ability of perennial weeds to store food reserves in their underground storage organs enhances their resilience and allows them to regrow after disturbance. Mowing can deplete the plant's ability to translocate photosynthetic resources. Mowing will only be effective after tillage has weakened or destroyed the underground storage organs.

For example, mowing Canada thistle just before flowering at its “bud to bloom” stage and after tillage will destroy young shoots before they replenish nutrient reserves. Regrowth after cutting will drain the stored food reserves, making it possible for repeated mowing to result in killing the perennial weed stand. These activities can also be timed to coincide with herbicide application



4. MOWING AND COVER CROPS

Cover crop mulch can be used to suppress weeds within crop rows. However, this strategy can be inadequate in the between row area when residue biomass is inadequate, or the crop is not planted at narrow row spacing. In such cases, mowing can contribute to weed suppression in a fast-growing crop where a cover crop restricts weed establishment but speeds up mulch decomposition process thereby reducing its effectiveness. An example has been demonstrated where mowing suppresses Canada thistle shoot density in a sudan grass-cowpea mixture compared to a fallow treatment.

5. MOWING AND HERBICIDES



If properly timed, mowing can suppress weeds within rows that escape herbicide treatment especially when it enhances crop competitiveness with weeds e.g., mowing close to the soil surface before using crop canopy closure. This strategy can also reduce the amount of herbicide sprayed.

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MOWING FOR WEED MANAGEMENT CONTINUED...

ADVANTAGES OF MOWING

- Unlike herbicide application or cultivation, mowing may be used repeatedly.
- It can suppress overgrown weeds to be managed with herbicides or cultivation.
- It has fewer off-site environmental impacts.
- Can be used during windy conditions (speed and direction) that inhibit herbicide efficacy.
- Conducive in highly populated urban and suburban housing areas.
- Effective in areas where cultivation will damage root systems or cause soil erosion.
- Compatible with other soil and plant conservation measures.

DISADVANTAGES OF MOWING

- It is challenging to use mow weed species of varying heights persisting in the same area.
- Mowing can favor weeds that develop and reproduce below the mowing height.
- Mowing works better in integrated or more holistic approaches.
- Does not kill weeds, only reduces aboveground competition.
- Does not work in weeds that form rosettes or mats and/or grow close to the ground.
- Wheel traffic occurring during mowing can compact some soils.
- It can be noisy and, and raise dust.

A PLANT-BASED APPROACH TO MANAGING GARDEN PESTS

By Karla Melgar, Small Acreage Management Specialist,
Front Range



If you have a vegetable garden, you most likely already experienced the pressure of some obnoxious bugs eating their way through your vegetable plants. Many options are available for bug control and there are lots of recipes online for natural or DIY bug sprays for your plants, but prevention is always preferred.

Using other plants to repel insects from your precious vegetables or attract beneficial predators has been used for a very long time. The practice of incorporating these plants with the goal to help vegetable crops is known as **companion cropping** and it has been studied and documented for many years. Companion crops are often flowers or aromatic herbs that play a key role on maintaining pollinators and predatory insect populations, which help balance a healthy ecosystem within your garden.

You can learn to integrate plant species to get the most benefits out of your garden

One example of these beneficial companion crops is planting some of the “spicy” Brassicas like arugula, mustard and napa cabbage together to act as trap crops for flea beetles. When a diverse composition of brassicas are planted together, the potential damage of flea beetle is reduced because insects will eat on those less desirable plants before they get to cabbage or broccoli plants.



Basil is a well-known plant to use as a companion crop. Several studies suggest that basil planted between tomato plants acts as a repellent to whiteflies, resulting in increased yields. Studies have also proven that basil is also an effective repellent against flea beetles, and even basil oils and spray repellents applied to garden vegetable plants can reduce the damage caused by insects. Furthermore, basil is also a host for generalist predatory insects like lacewings, that feed on many soft-bodied insects, and it is believed by some to improve the flavor of vegetables planted around it.

Marigold plants are allelopathic, they release toxic substances that protect it's roots against nematodes, some insects and even plant pathogens, basil and marigold plants are efficient at fighting root rot nematodes, and reducing the damaged caused by thrips, especially when planted as companion for tomato plants, resulting in higher yields

In greenhouse settings, marigold and white mustard have also shown positive results when planted as companions for tomatoes. Cucumber plants are often benefited from planting Marigolds between rows, as it reduces the severity of insect pest damage to the foliage.

Thyme planted along with cabbage and broccoli provides good protection against flea beetles, root maggots and cabbage worms. Similar effects can be observed with garlic planted with brassicas or using garlic or thyme oils as a repellent on plant foliage. Brussel sprouts can be benefited from planting onion and nasturtium neardby, which reduces the damage associated with the cabbage looper and cabbage worms. Nasturtium is also an easy to frow annual that has been used for many years as a companion crop to squash, pumpkins and cucumbers and research has shown positive impacts of nasturtium to reduce the damage from squash bugs and cucumber beetles.

"The Iroquois and the Cherokee called corn, bean, and squash "the three sisters" because they nurture each other like family when planted together...The three plants thrive together better than when they are planted alone."

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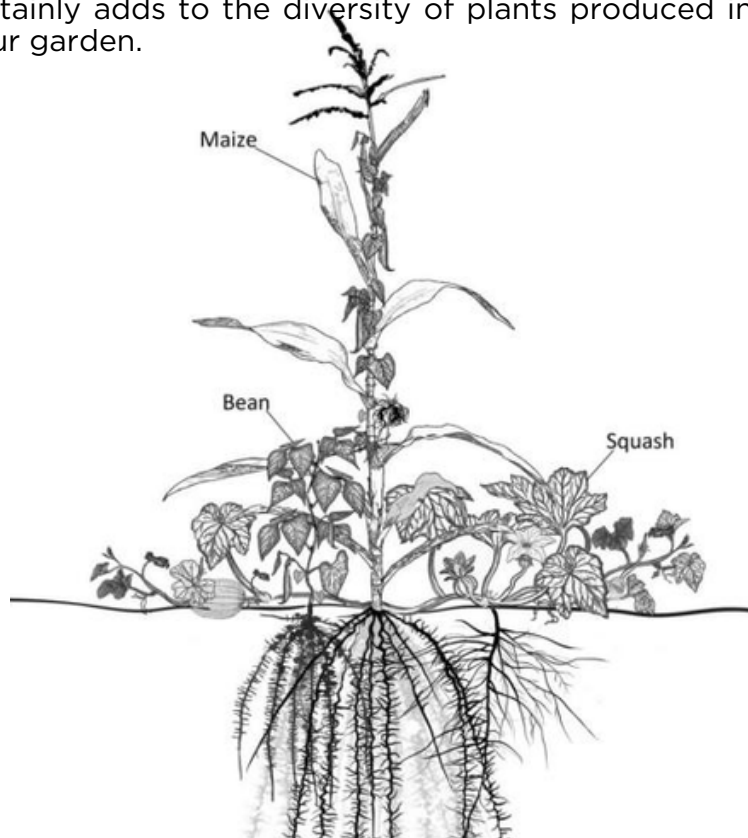
Crops that work well together...

Some other crops just work well when planted together, one classic example is beans planted between corn rows. This way of mixing crops has been practiced for hundreds of years in the Americas and it is still one the most common farming practices along the dry corridor of Central America. This practice is so beneficial because the leaves and low growth of beans serve as a mulch layer that on the soil that also prevents weed growth. Additionally, beans, and other members of the Fabaceae family help take nitrogen from the atmosphere, so planting beans also fertilizes corn with much needed N.

The three sisters method

Three sister planting consists of intercropping corn, squash or pumpkins and beans together in a way that one crop benefits from the other. This practice was central to the diet of many Native American tribes. This combination of plants work well together due to the corn serving as a trellis for both beans and squash, while the wide, prickly or hairy leaves of squash keep animals away from the corn, while beans serve as ground cover and fixate nitrogen from the atmosphere, all while producing highly nutritious food.

Consider implementing some of these companion crop combination in your garden to create richer habitats for pollinators, produce great quality vegetables, make colorful gardens and reduce the need for chemical herbicides. Companion crops may not be the ultimate solution for pest control but it certainly adds to the diversity of plants produced in your garden.



The classic milpa with maize-bean-squash by Lopez-Ridaura, S., Barba-Escoto, L., Reyna-Ramirez, C. A., Sum, C., Palacios-Rojas, N., & Gerard, B. is used under the Creative Commons Attribution 4.0 International License (CC BY 4.0).

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PRAIRIE DOG CONTROL FOR SMALL ACREAGES

By Kat Caswell, Weld and Washington County Agronomy Agent

Prairie dogs are a hallmark of the west, inspiring "ohs and awes" from tourists and "do not feed the prairie dog" signs from national parks. There are three species found in Colorado: white-tailed, black-tailed, and Gunnison prairie dogs. The most prevalent being the black-tailed prairie dog (*Cynomys ludovicianus*) that is found along the Front Range and eastern plains. Prairie dogs are hosts for fleas, which carry plague bacteria. While the likelihood that a human would contract the plague from a prairie dog bite, petting, holding, and feeding wild prairie dogs is highly discouraged. Prairie dogs are a keystone species in the western USA prairie ecosystem and are extremely vital to the reestablishment of the black-footed ferret. Despite their value, these large ground squirrels can become a nuisance to small landowners and diminish pasture grasses to an extent that necessitates control.

Prairie dogs form large colonies, referred to as towns. Sprawling towns are composed of small sections, coterries, that consist of a male, several females, and pups. A single coterie can occupy 1 acre with anywhere from 35 to 60 mounds that serve as look out towers, entrances, exits, and prevent rainwater from washing into the burrows. Black-tailed prairie dogs remain active in the winter and mate in the spring to produce a litter of pups in March through April. Pups emerge from the burrows five to six weeks after birth.

When moving into an area or expanding an existing town, prairie dogs will clip the surrounding vegetation to a lower height. Green, growing grass is the favored food of prairie dogs, although they do not prefer any specific grass. As a prey species, prairie dogs prefer to have a long line of sight, to best alert the town of any dangers. In prairie ecosystems, the process of clipping grasses can provide nesting habitat for birds and increase grazing for wild ungulates. Towns of connecting underground burrows can also provide habitat for burrowing owls and the endangered black-footed ferret. In small acreage pastures, this process can exacerbate the issue of overgrazing and over-mowed pastures, making it more difficult to reestablish or maintain a grass stand.

To discourage prairie dogs from moving on to a property, maintain grass and forbs at a healthy height. Do not over-graze or over-mow areas where prairie dogs may be prone to building a town in. Visual barriers, like small pine trees, are an option for discouragement and slowing colony expansion. There has been limited research on the method of catching and relocating entire colonies with little success at reestablishing colonies in a new location. Contact the Colorado Parks and Wildlife for more information regarding the process of obtaining a trapping permit.

Rodenticides and other extermination methods should not be the sole control practice but should be used in conjunction with the reduction of desirable habitat and consistent, good, conservation management. The impact of black-tailed prairie dogs on rangeland is mixed, both reducing available forage in some locations and improving the vegetative diversity in others. Smaller properties and pastures may have an obvious reduction in grazing potential following a coterie establishment.

RODENTICIDE USE

All forms of rodenticides labeled for use on prairie dogs are restricted use pesticides (RUP), except one. To acquire and use RUPs, a landowner must either have a private pesticide applicator license or hire a licensed commercial applicator. To obtain a private applicator's license through the Colorado Dept. of Ag., a private applicator's license entitles the holder to apply RUP on to their own property. Any individual that is applying rodenticides for profit will be required to have a commercial's applicator license. If you are a small landowner, consider working with a pest management company rather than obtaining a pesticide applicator's license.

Before using a rodenticide, positively identify the target undesired species (prairie dogs) and monitor the area for any other wildlife that may be impacted by the selected control method. It is critical to determine if the black-footed ferret is in the area before choosing to use a rodenticide. Always be sure to read and follow all labeled directions for any pesticide product. All pesticide labels are law. Failure to do so can result in fine and citations.

There are two types of poison baits that can be used in Colorado: zinc phosphide baits and anticoagulant poisons. Both are most effective when the surrounding grass has become brown and dormant. Zinc phosphide reacts with stomach acid and releases phosphine gas, which quickly kills the prairie dogs. Baited products require site monitoring prior to use to identify if the burrows are used by other wildlife. Pre-baiting directions should be followed to ensure the poison is most effective. The greatest loss of efficacy of these products is due to failure to properly pre-bait. Following poison bait distribution, landowners should monitor the area and remove any carcasses.

The anticoagulant poisons labeled for use in Colorado are **RozolITM** and **Kaput-DTM/Kaput ComboTM**. Both products can only be used from November 1st through March 15th of the following year to control the black-tailed prairie dog only. There is an enforceable endangered species protection pesticide use limitation on these products, the details of which can be found on [Bulletin Live! Two](#). The Front Range and portions of western CO fall within the use limitations. For more details on how to use poison bait, refer to the product label and [the CSU Extension, Managing Prairie Dogs factsheet](#).



Fumigant use

Two types of fumigants are labeled for use in Colorado: aluminum phosphide and USDA gas cartridges. Aluminum phosphide products are more readily available of the two. Use of aluminum phosphide products incur additional safety stipulations, including area of use, transportation requirements, signs at the application site, and fumigation management plan. Black-footed ferret surveys are required, following the U.S. Fish and Wildlife guidelines, before fumigation can be used. Due to the flammable nature of aluminum phosphide products, small landowners may want to consider using a less labor-intensive product.

Landowners may be tempted to purchase and use general use products for gassing mole and gopher burrows. While prairie dogs are a species of ground squirrel, these products also contain pesticide labels that restrict their use on prairie dogs. For example, the product Victor - Quick-StrikeTM Mole and Gopher Gasser contains language in its use label detailing that the product is not for use for within 4.3 miles of any prairie dog town "unless the colony is an isolated black-tailed prairie dog town less than 80 acres in size... or unless the town has been appropriately surveyed, using methods acceptable to the U.S. Fish and Wildlife Service, and found not to contain black-footed ferrets and found by the FWS not to be a suitable site for ferret reintroductions."

Revegetating after controlling prairie dog colonies

Prairie dog extermination does not ensure plant regrowth, particularly on small acreages that have experienced drought or overgrazing. Following prairie dog extermination, it is important to reestablish vegetation in the area to deter another colony. Some weed control may be required before reseeding. Mounds should be leveled, and livestock should be removed from the area for at least one growing season to allow any remaining vegetation to regrow. Plan on reseeding dryland areas during the November to March period following prairie dog termination. When livestock is put again in pasture it is important to consistently practice good grazing management to prevent animals from over grazing or loafing too much in one area, killing the grass and opening the site up for prairie dogs to build a new town.

Prairie dogs are a North American keystone species in the prairie ecosystem. Black-footed ferrets can consume approximately 100 prairie dogs in a single year, relying on them as their primary food source. Despite the benefits prairie dogs bring the larger ecosystem, established towns on small land parcels can destroy pastures. When selecting a control method, determine what product will best target the undesired species with minimal impact to the non-target wildlife. Refer to Bulletin Two! Live for locations where pesticide use is prohibited at certain times to protect endangered species. Remember to make a plan to revegetate the site of prairie dog removal to discourage future towns and always practice good grazing and conservation management.

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RESOURCES AND EVENTS

PAWNEE BUTTES SEED, INC. GRASS TOUR 2023

Dates: August 17th- Small Acreage Management North of Greeley.
August 18th- The Roberts Ranch in Livermore
[Click here](#) for more details and to purchase tickets.

Agriculture Festival at plains conservation center.

Saturday, Sept 16, 2023.
[Click here](#) for details

Native grass educational workshop and project site visits

Thursday and Friday, July 27th and 28th.
Colorado Springs
[Click here](#) for details

2nd Saturdays at SPUR

2nd Saturdays at CSU Spur are free and open to the public for lots of family-friendly programming. [Click here](#) for more information and events you can find at SPUR campus

CSU plant health clinic: advanced diagnostic skills

June 23 and 24, 2023.
Each group will meet for a total of 4 sessions. Each session will run from 10 a.m.-1 p.m. The first 30-minutes will include a short lecture alongside instructions for working with the day's plant samples. The remainder of lab time will be dedicated to hands-on examination of plant samples using diagnostic tools and microscopes, supported by senior technical assistance.

- Friday Group: June 23, July 7, July 21, and July 28
- Saturday Group: June 24, July 8, July 22, and July 29

Cost:

Course tuition is \$260 per participant and includes 4 Friday OR 4 Saturday sessions, plus all materials.

For more information visit [CSU SPUR website](#)

Learn how to get assistance from NRCS for Urban Agriculture Projects by [clicking here](#).