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**COLORADO STATE UNIVERSITY EXTENSION  
BOULDER COUNTY**

**BOULDER  
COUNTY RURAL  
LIVING  
RESOURCE  
GUIDE**

**Agriculture**



**COLORADO STATE UNIVERSITY  
EXTENSION**

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# INTRODUCTION

This section covers various aspects of agriculture in the county. The livestock aspect of agriculture is covered in a separate section.

Right to Farm

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# AGRICULTURE

## Right to Farm



Colorado is a “Right-to-Farm” state. Landowners, residents, and visitors must be prepared to accept the activities, sights, sounds, and smells from agricultural operations as a normal and necessary aspect of living in a county with a healthy agricultural sector. Those with an urban sensitivity may perceive such activities, sights, sounds, and smells unacceptable. However, state law and individual county policies provide that ranching, farming, or other agriculture activities and operations shall not be considered to be nuisances so long as operated in conformance with the law and in a non-negligent manner. Therefore, rural residents must be prepared to tolerate noises, odors, lights, mud, dust, smoke, chemicals, slow moving machinery and livestock on public roads, storage and disposal of manure, and the application by spraying or other methods of chemical fertilizers, soil amendments, and pesticides, any one or more of which may naturally occur as part of legal and non-negligent agriculture operations.

All land owners, whether ranch, farm or residence, have obligations under state and county laws and regulations with regard to fence and irrigation ditch maintenance, managing weeds, keeping livestock and pets under control, using the property in accordance with zoning, and other aspects of good land and livestock ownership and stewardship. New residents and landowners are encouraged to learn about these rights and responsibilities and act as good neighbors and citizens.

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## References:

State of Colorado Right to Farm Statutes  
[www.nationalaglawcenter.org/assets/righttofarm/colorado.pdf](http://www.nationalaglawcenter.org/assets/righttofarm/colorado.pdf)



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## Agriculture Safety

Agriculture ranks among the 10 most hazardous industries. Farmers and ranchers are at very high risk for fatal and nonfatal injuries. Agriculture is one of the few industries in which the family members (who often share the work and live on the premises) are also at risk for fatal and nonfatal injuries. Many of these deaths and injuries are preventable by implementing safe working and operating procedures at the farm.

### Machinery

In Colorado, most of the agriculture-related fatalities are attributed to the operation of machinery. Other major causes of fatalities result from electrical accidents (12%); injury by animals (8%); drowning (7%); and chemicals (2%). Prevention starts by:

- Knowing how to operate machinery safely, and applying appropriate safety practices, keep safety guards in place;
- Knowing how to handle and being cautious and alert around animals;
- Safe chemical use, including personal protective equipment and proper application methods;
- Locating power lines before moving augers and irrigation pipes, etc.;
- Restricting children from equipment and irrigation canals; and
- Never allowing passengers on tractors unless a seat is provided.
- Operating equipment when tired or in a hurry or not focused increases injury risk.

Roll-overs are common when tractors are not properly operated. Always drive down-hill with conventional-style tractors (rear wheels larger than front wheels) where 35% of the weight is in the front; 65% is in the rear. Newer tractors are equipped with a rollover protective structure (ROPS). Always operate ROPS-equipped tractors with the seatbelt fastened. Only non-ROPS or non-roll-bar-equipped tractors can be operated without a seatbelt; however, ROPS devices are available for older tractors. Only one tractor death has been reported for an operator wearing a seatbelt with a properly-installed ROPS. Deaths are reported, however, for ROPS-equipped tractors whose operators did not wear seatbelts. It is more dangerous to not wear a seatbelt with ROPS than to have no ROPS at all.

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## Livestock

Livestock safety involves calm, quiet, and careful handling to reduce the animal's stress and the handler's injury potential. Animals are not always predictable, so accidents can happen. Learn how to safely move and handle your livestock. Depending on the number of animals you have, work with them so that they are accustomed to you. It is important to train your animals to load into a trailer prior to a disaster or emergency. Practicing loading and unloading will lessen problems during an evacuation and decrease the potential for injuries. Keeping livestock calm reduces the chance they will react to outside influences. Intact male livestock often have a greater potential to harm handlers than do other animals.

Never allow small children in pens with any intact type of livestock (bulls, rams, boars, stallions). Horses generally injure and kill more people than do other types of livestock. All equine riders should wear a riding helmet. Safety on the farm or ranch begins with common sense. Focus on the task at hand and take frequent breaks to reduce mental or physical fatigue.



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## Resources:

Farming and Ranching Health Hazard or Opportunity, CSU Extension Fact Sheet #10.201  
<https://extension.colostate.edu/topic-areas/family-home-consumer/farming-ranching-health-hazard-or-opportunity-10-201/>

Making Decisions and Coping Well with Drought, CSU Extension Fact Sheet #10.256  
<https://extension.colostate.edu/topic-areas/family-home-consumer/making-decisions-and-coping-well-with-drought-10-256/>

Managing Stress During Tough Times, CSU Extension Fact Sheet #10.255  
<https://extension.colostate.edu/topic-areas/family-home-consumer/managing-stress-during-tough-times-10-255/>

Ranching and Farming with Family Members, CSU Extension Fact Sheet #10.217  
<https://extension.colostate.edu/topic-areas/family-home-consumer/ranching-and-farming-with-family-members-10-217/>

10 Tips for Successful Family Meetings, CSU Extension Fact Sheet #10.249  
<https://extension.colostate.edu/topic-areas/family-home-consumer/10-tips-for-successful-family-meetings/>



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## Open Burning

Anytime you light a fire outdoors, you are conducting an open burn. The State of Colorado regulates open burning to protect public health and the environment. An Open Burning Permit must be obtained for open burns except agricultural burns (i.e. ditch burning) which are normally exempt from the permit, but it is wise to get a permit anyway. Permits are issued by the Boulder County Sheriff's Office. Anyone performing an open burn in Colorado needs to have a permit and make all necessary notifications (local fire district, Boulder County Dispatch and Boulder County Health Dept.) prior to any burning. Based on climatic and precipitation conditions the county sheriff or Public Health may put a burn ban in place in which no burning is allowed even with a permit.

Materials that may be burned with a permit include untreated, natural wood sticks and branches, leaves, dry grass, slash piles and weeds. Materials that are illegal to be burned include tires, chemicals and plastic. Please check with your local authorities before conducting any type of burning on your property. The use of a backyard burn barrel or burn pit may not be allowed.

If you are burning 50 or more slash piles, greater than 10 acres of grass or greater than 5 acres of other vegetation, you must obtain a smoke permit from Colorado Department of Public Health and Environment Air Pollution Control Division and have a Boulder County Burn permit.

## Permit Exemptions

1. Flares used to indicate some danger to the public.
  2. Campfires (be sure to follow any open burn bans in place) for instructional or recreational purposes and non-commercial cooking fires.
  3. Agricultural burning is exempt from open burn permitting. These burns are still subject to fire district and municipal fire rules. Agricultural burning is defined as the burning of water conveyance ditches and/or fields to prepare the ditch for irrigation water conveyance; for weed management and other agricultural purposes. Please note that land zoned as "agricultural" does not automatically provide exemption from open burning permitting. In granting or denying such permits, the county bases its decision on the location or proximity of a proposed burning to any building or structure; the potential contribution of the proposed burning to air pollution; climatic conditions on the burn day or days; and compliance by the applicant with applicable fire protection and safety requirements of the local authority. Other permitting considerations include whether any practical alternative method for the disposal of the material to be burned exists, and whether the burning will be conducted in a manner that will minimize emissions.
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## Resources:

Colorado Department of Public Health and Environment; Air Pollution Control Division.  
[www.cdphe.state.co.us/ap/smoke/](http://www.cdphe.state.co.us/ap/smoke/) (click on “Permits” then “Open  
Burning Permits”)

Boulder County Burn Permit

<http://www.bouldercounty.org/safety/fire/pages/openburnpermit.aspx>

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## Weed Management

“Weeds are not inherently evil plants. They just are regular plants that have adaptations that allows them to associate with human activity and thus are bothersome to humans.”  
Montana State University

Noxious plants are any plants that have the potential to aggressively invade, compete with or threaten economic crops or native plant communities; are poisonous to livestock or humans; harbor detrimental insects, diseases or parasites; and are detrimental to sound environmental natural or agricultural ecosystem management and are defined by federal and state law. These plants are non-native, aggressive, and can out-compete native and desirable plants for resources such as moisture, sunlight, nutrients, and space. Obnoxious/nuisance weeds have similar attributes as noxious weeds but do not have similar legal responsibilities and laws tied to them (i.e. required eradication).

New rural landowners often discover that managing weeds is one of the most time-consuming and boring land stewardship responsibilities. Being a good land steward and neighbor means that landowners need to know what weeds are on the property, the size of the infestations, know your options for management, be alert for new weed infestations and actively manage existing infestations. Weed management is more successful if neighbors join forces to manage weeds that can spread from property to property.

## Ecosystem Affects



- Weeds can crowd out native plants altering native habitat.
  - Weed growth and spread can alter fire patterns and intensity, resulting in major ecosystem changes such as more frequent and intense wildfires.
  - Weeds can affect soil erosion and aquatic habitat in nearby streams and ponds. A spotted knapweed study showed that runoff increased by 56% on areas infested by spotted knapweed and that sediment (top soil) loss increased by 192% (Lacey et al. 1989).
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## Wildlife

- Many alien plant species provide poorer habitat for wildlife species and livestock than native counterparts. Studies in Montana showed a 98% decrease in elk use of a bunchgrass range and a 67% decline in carrying capacity (rangeland forage production) after spotted knapweed took over (Hakim 1979).
- Tamarisk and Russian olive thickets along rivers provide much poorer wildlife habitat than native cottonwood and willow communities (Carpenter 1997, Knopf and Olson 1984).

## Agriculture

- Weeds create large economic losses for agriculture in both cropland and rangeland situations due to decreased production, disease and management costs.
- Weeds can harbor detrimental insects, diseases or parasites decreasing crop yield.
- Weeds reduce forage production for livestock by crowding out palatable species.
- Some species like St. Johnswort, Russian knapweed and leafy spurge are toxic to livestock.
- Ranches that have been infested by leafy spurge sometimes sell at a fraction of their values prior to leafy spurge infestation (Olson 1999).

## Colorado Noxious Weed Law

To manage those plants that may out compete native vegetation, food and forage crops, the United States Department of Agriculture (USDA) has compiled a Federal Noxious Weeds list (Public Law 93-629 (7 U.S.C. 2801 et seq.; 88 Stat. 2148), enacted January 3, 1975). In Colorado, agricultural and natural resources are protected by the Colorado Noxious Weed Act (CRS 35-5.5, 2003). The law requires landowners to manage certain undesirable plants and establishes a state-wide noxious weed list that prioritizes the weeds into four lists.

Eradication and management methods for each list are specified in the Act. In addition to the state and federal noxious weeds list, Boulder County has its own specific noxious weed list.

- List A plants are designated for eradication on all County, State, Federal and Private lands.
  - List B are plants whose continued spread should be stopped; there are county-by-county recommendations for management/eradication.
  - List C plants are selected for recommended management methods
  - Watch List plants are plants whose impacts and distribution on not yet well understood.
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## Authority of the Colorado Weed Law

- Gives local governments authority to require the management of certain undesirable plants by state boards, departments, or agencies that manage or supervise state lands.
- Gives local governments authority to require landowners to manage undesirable plants, provide for arbitration procedures, and due process.

The Board of County Commissioners and the Community Planning and Permitting Department are responsible for enforcement of the county weed management plan (or, in incorporated areas, the municipality is responsible). Although the Boulder County Extension Office is not responsible for the enforcement of the weed law, they can assist you with weed identification and integrated weed management recommendations.

Nuisance weeds are non-native plants that are not defined as noxious weeds by the State of Colorado. They interfere with our plans for a property. Management is not mandated by law but is recommended if the plants are aggressively colonizing your property and reducing forage plants.

## Weed Management Strategies

Landowners should have a weed management strategy/plan to deal with both noxious and obnoxious/nuisance weeds beginning with:

1. Recognize weed management to be an on-going process where the outcome of management efforts may vary.
  2. Establish goals for your property, i.e. pasture for livestock, hay production, wildlife habitat, etc.
  3. Identify weed species. Take suspect weeds to your CSU Extension office or weed management professional for identification and management methods. Mechanical methods work best on annual and biennial weeds. Organic herbicides are most effective on small weeds. Perennial plants like Canada Thistle or Leafy Spurge when pulled or cut simply spread more due to their extensive root systems. In this case, a chemical might be your best choice. Identify all the methods that are effective and use as many of them as possible to achieve management. Colorado State University Extension or your county weed manager can help you develop a weed management plan based on the weed/s and your personal goals and plans.
  4. Monitor the results of management actions and evaluate the results considering the property management goals.
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An integrated pest management (IPM) system is the most effective system for managing weeds. The IPM system integrates multiple management methods to achieve the best possible outcome. The methods include preventative measures, cultural, mechanical, biological, and chemical methods both “synthetic” and “organic”, and educational opportunities. Preventative measures include making sure that new weeds are not brought onto a property by animals, in seed or hay or on equipment. Cultural methods include keeping desirable vegetation healthy so that it can compete with the invaders. This includes proper grazing management and mowing/cutting heights, purchasing seed and hay from reliable sources and not bringing seed in on equipment. Mechanical methods are exactly what they sound like, any method such as tillage, hoeing, mowing, hand pulling, grazing and fire. Biological methods include livestock grazing, and other biological agents such as insects, fungus and bacteria. Biological methods take longer to establish and may not completely eradicate the weed, so they must be used in conjunction with other methods for the A list weeds, as this method does not eradicate the weeds, as stipulated by the law. Chemical methods include both “organic” and “synthetic” herbicides. Proper herbicide use is critical to managing weeds. The purpose of integrated weed management is to achieve healthy and productive plant communities using the least environmentally damaging methods. A combination of all methods results in the greatest success.

## Herbicide Use Tips

### **Follow the label**

The label is the representation of a federal law. If you do something out of compliance with the label, it is a violation of federal law. The label information is there to help you get the most out of a product. Pay attention to the safety information. Look at the list of weeds managed; it can keep you from using the wrong product or at the wrong time. Check to see if a surfactant or other additive is needed — it can make the herbicide more effective.

### **Calibrate the sprayer**

One reason for herbicide failures is incorrect sprayer calibration (handheld, ATV or truck mounted). If your sprayer is not properly calibrated, you have no idea how much herbicide you're applying. Applying too much herbicide wastes money and can injure desired vegetation and applying too little gives poor weed management and contributes to herbicide resistance.

### **Spray the right product**

I've heard a comment like, "I've sprayed the cheatgrass with 2, 4-D every year for five years and I've still got it." There's a good reason for that — cheatgrass is a grass not a broadleaf plant, and 2, 4-D, a broadleaf herbicide, is not effective on grasses only on broad leaf plants. Likewise, the product glyphosate (Round-up) is not a soil sterilant like people think it is. It is non-selective meaning it will kill any green plant if applied at the correct amount. Always read the label for the location where the herbicide can be used, and the list of weeds managed by that product before you spend money on it.

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## **Mix the product at the rate recommended on the label**

Mixing a product stronger or weaker than on the label recommendation can hinder success and lead to the weed developing herbicide resistance. It can cause collateral damage to other desired plants. If your herbicide has been stored in the shop for many years, it most likely is not as strong as it once was. Over time herbicides break down especially if they have been exposed to temperature extremes or light.

## **Spray at the right time**

After poor sprayer calibration, the second biggest cause of herbicide failure, is spraying at the wrong time. What is the wrong time? One example of spraying at the wrong time is spraying a leaf-absorbed herbicide before the weeds emerge, for instance, spraying 2, 4-D on ragweed in the spring before it has green leaves to absorb the herbicide. Another is spraying an annual or biennial after the plant has seeded and is already dying. Most herbicides do not kill seeds only living plants.

## **Control drift**

Make sure your herbicides get on your weeds on your property and nowhere else. Having your herbicides kill the neighbor's garden, flowers, trees, etc., is unlikely to make that person very happy. Check the wind before you spray, and don't apply herbicides when the wind is too strong (is blowing in the direction of your neighbor's property or your fruit trees and garden). Calibrate and select your sprayer nozzles for coarse droplets instead of fine sprays. This can reduce drift. Do not spray above 85 degrees F as some herbicides volatilize and drift. Choose the amine version of herbicides if possible as they do not volatilize as readily as the ester versions (i.e. 2,4-D).

The Boulder County Extension Office can assist you with weed identification and management.



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## References:

Pictures and fact sheets on noxious weeds from Colorado Dept. of Agriculture:

<http://www.colorado.gov/cs/Satellite/Agriculture-Main/CDAG/1167928184099>

Colorado Noxious Weed Act

[http://www.colorado.gov/cs/Satellite?c=Document\\_C&childpagename=Agriculture-](http://www.colorado.gov/cs/Satellite?c=Document_C&childpagename=Agriculture-)

[Main%2FDocument\\_C%2FCDAGAddLink&cid=1251616643546&pagename=CDAGWrapper](http://www.colorado.gov/cs/Satellite?c=Document_C&childpagename=Agriculture-Main%2FDocument_C%2FCDAGAddLink&cid=1251616643546&pagename=CDAGWrapper)

Colorado Department of Agriculture Noxious Weed Management Program

[www.colorado.gov/ag/weeds](http://www.colorado.gov/ag/weeds)

CSU Extension Boulder County - Small Acreage Management - Weed Resources

<http://boulder.extension.colostate.edu/natural-resources/weeds/>

Information on noxious weeds from the Colorado Weed Management Association:

<http://www.cwma.org/noxweeds.html>

Noxious weed ID guide and pamphlets available from the Colorado Weed Management Association:

<http://www.cwmastore.com/SearchResults.asp?Cat=37>

Weeds of the West, 10th edition. 2006. Tom Whitson, Ed. U of Wyoming -- Good pictures and descriptions. Has both noxious and pasture weeds.

[http://wyoextension.org/publications/Search\\_Details.php?pubid=696](http://wyoextension.org/publications/Search_Details.php?pubid=696)

Weeds of the Great Plains, 3rd edition, James Stubbendieck, Geir Friisoe, Margaret Bolick, Univ. of Nebraska - Same photos and weeds as Weeds of the West but contains more information on each weed.

<https://nda.nebraska.gov/forms/nw11.pdf>



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## Managing Small Pastures

Many people overlook the importance of managing smaller pastures, and consequently, they are often the most abused lands in the county. Overgrazing occurs when there are too many animals grazing in a pasture for too long and then not giving the grass plants sufficient recovery time. Proper grazing management maximizes the amount of forage your plants produce and livestock forage utilization.

Like humans, livestock have preferences in the food/plants they eat. Their choices may be made based on taste, maturity level, nutrient level, texture and availability. They have preferred grasses and preferred timing for those grasses so having a multispecies pasture is most likely to provide everything your animals need. Having a multi species pasture is also good for your soil. Like livestock, different soil organisms may rely on specific plants. Having diverse plants promotes diverse soil organisms. Grasses depend on livestock or wildlife for seed dispersion, soil disturbance and fertilizer (manure). There is some research that livestock saliva stimulates grasses to grow. Given free choice, animals seek out their favorite forage plant and continue to graze on it until they have overgrazed it. Grazing management attempts to get animals to graze as many species as possible without overgrazing any specific species.

Questions to ask about your pasture are:

- What will you use the pasture for? ·
- Will it be for grazing only, haying only, or haying with some grazing?
- Do you want the pasture to look more like your lawn (sod forming grass) or do you mind a clumpier/bunchy look (more native look)?
- Can your soils and access to water support the look you want? Matching the pasture vegetation to your land management objectives, your livestock and your site will ensure successful grazing.

Contact the Boulder County Colorado State University (CSU) Extension or Natural Resources Conservation Service (NRCS) office for assistance.

### **Decide How You Want the Pasture to Look**

Do you want a mix of grasses and forbs (i.e. alfalfa or clover), forbs only, grass only, or bare ground (hopefully not this!)? Knowing your desired use is the first step in managing a small pasture. Too many animals (be it horses, cattle, sheep or goats) leads to bare ground on dryland, and a short sod and weeds on well irrigated pastures. Animals can be used to manipulate the plant composition in a pasture. Animals, such as goats or sheep, selectively graze more forbs and shrubs making them less prominent over time. Conversely, cattle or horses select out the most desirable grasses and plants, thus forbs, shrubs and unpalatable grasses become more prominent in the pasture over time.

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## **Tips for Improving Small Pastures and Encouraging More Grasses**

Management principles are the same for small pastures as for rangelands and equally as important. The basic steps are as follows:

- Limit access to pasture and/or allow for longer rest periods to maintain 4" or more of stubble year-round based on the grass species.
- Once grass starts growing in the spring (late February into March), keep animals off pasture until there is six to eight inches of grass growth or more based on the predominate species.
- Use a rotational grazing scheme. Rotational grazing refines the "take half and leave half" principle and lets you manage your pasture more intensively, increasing forage utilization.
- Manage weeds. Many pastures that have historically been abused or not allowed long-term rest have more weedy plants and brush species than grasses and desirable plant species.
- In worst case scenarios where a pasture is severely overgrazed or has more weeds than forage, renovation or re-seeding may be needed. First manage weeds and other issues then reseed with a mixture of grass species or grass legume mix appropriate for your property goals, water availability and soil.

## **Basic Principles of Good Pasture/Range Management (Rotational grazing)**

Small acreage landowners need to adhere to the "take half and leave half" method. The concept is by only grazing one-half of the available forage and leaving half, the existing plant community is sustained and kept healthy. By not grazing too much of a plant, the plant can regrow and replenish its stored energy reserve.

Another consideration is timing of grazing. Grazing too early in the spring causes the plant to utilize its energy reserves without being able to replenish them, and consequently, it cannot regrow as fast as other ungrazed grasses. In early spring, grass is using stored energy reserves to grow leaf surface area for photosynthesis. Until the grass has enough leaf surface area to photosynthesize more energy than it can use (usually 6-8" height), it must continue to use stored root energy. If grazed too early and too often, the plant never produces enough energy to store in the roots for the following year. Multiple years of overgrazing leads to root die-off and eventual grass die-off. Therefore, it is important to change the time of year each pasture is grazed every year to ensure a healthy pasture with high plant diversity.

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## Grazing Heights for common forage grasses

<b>Forage plant (inches)</b>	<b>Start grazing minimum (inches)</b>	<b>End grazing</b>
Alfalfa	6	4
Blue grama	3	2
Little bluestem	6	4
Orchardgrass	5	3
Big bluestem	8	6
Sideoats grama	6	4
Smooth brome	5	3
Western wheatgrass	6	4
Tall fescue	5	3
Meadow brome	8-12	4
Crested wheatgrass	4	2

Healthy pastures are a mix of species, grasses and forbs, not a monoculture of a single species (i.e. smooth brome). Having a mix of grasses and legumes is ideal as legumes are nitrogen fixers and grasses are nitrogen users. Diversity not only provides variety for livestock but also for soil microbes. Different grasses and forbs vary in their protein content and other nutrients and vary in their values during the growing season. Livestock select forage plants based on taste and nutritional needs.

Grazing impacts vary throughout the year and growing season. Plants are most severely affected from grazing too early and during seed formation when they need maximum energy to produce seeds. The least critical time for grazing is dormancy (i.e., late fall and winter). Grasses grazed while dormant are not as adversely affected as the plant that has already stored energy (in the lower part of the stem); therefore, grazing or leaf removal has little impact on the plant's ability to regrow the following spring. The only concern with grazing at this time is completely grazing all the vegetation down to the plant crowns or the pasture is utilized when the ground is muddy or icy and the crowns are damaged by hooves. Maintain stubble of 3 – 4" (based on the grass species) year-round including winter to keep grasses healthy.

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In this arid environment, it takes between 25 and 40 acres to support a horse (1 cow or 5 sheep, goats or alpacas) with no supplemental feed for a year. You need to set-up smaller grazing cells on the property to make sure you are fully utilizing your forage. A general recommendation for grazing cell size is about 1000 sq. feet per unit/animal (horse or cow, 200 ft. sq. for a goat, sheep or alpaca) that are in the area. Breaking a larger pasture up into smaller grazing cells helps maximize forage use. Given the opportunity, animals roam around a property grazing only certain plants. If allowed to stay in the pasture for a long period of time, they continue to keep coming back to these plants as they attempt to regrow. Over time this constant grazing reduces the energy in these plants and eventually they die. Their favorite plant species can be determined by surveying the pasture and seeing which plants have been grazed lower than other plants. This leaves fewer desirable plants. Breaking pastures up into small areas allows you to do more rotation and keep the animals in one area for a shorter amount of time but on pasture for a longer time. This method also encourages animals to utilize more of the plant species in the smaller pasture. You can do this with portable fencing until you figure out what size each cell should be both for maximum forage use and the habits of the animals. Goats tend to be harder to use portable fencing on, so you may want to use lighter weight livestock panels and T posts to make your cells. It may also be a matter of which set-up takes less fencing and works with your water sources. Your water sources may limit how many cells you can set-up.



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Animals are not allowed to graze a pasture in the spring until the grass is 6 – 8” tall (grass species dependent). Animals are moved into a grazing cell/pasture and allowed to graze until the preferred grass/forb has been grazed down to 4” (based on the grass species) preferably in 7 – 10 days. By 14 days after being grazed a grass/forb begins to regrow.

Animals key in on this new growth and come back to this plant, grazing it again. This quick re-graze is stressful to the plant. Forage plants need a rest period of at least 28 days to allow rest and regrowth prior to grazing again. The more rest time you allow the better. Animals are moved to the next cell until the same process has happened and then moved to the next cell. You do this until you’ve grazed all the cells at which point the animals are removed from the pasture and kept in the dry lot unless you have enough pastures that the first cell grazed has regrown and can be grazed again. The more cells you have the longer the animals can stay on the pasture and the less hay you need to feed them. The smaller cell size gets the animals to graze more of the grasses/forbs not just selecting their favorite, so you get better overall forage usage.

The reasoning behind this cycle has to do with the way pasture grasses grow. In the spring, grass starts to grow from buds formed in the fall. Until the grass stems (tillers) are 6 – 8” tall (species dependent), the plant uses stored energy to produce the tillers (stems) and leaves.

Once the plant reaches this height, it has enough leaf surface area that it can photosynthesize and send surplus energy back into the lower stem and roots for storage. So, waiting until the grass is this height lessens stress on the plants. Grasses have a growing point (apical meristem where most of the cell division and growth occur) that moves up the stem as they grow. Preserving the growing point makes it easy for the grass to resume growing after grazing or haying. Removing the growing point by grazing or haying stops the growth on that stem. The grass must stimulate a dormant bud to grow to replace the overgrazed stem. This takes more energy than a stem re-growing from a growing point. The growing point is different for each grass species. This is the reason why the difference in height for starting and stopping grazing in the chart above. Allowing grass plants to preserve as much energy in the lower stems (tillers) and root system as possible keeps the grass healthy. You must maintain a stubble of 3 -4” (species dependent) throughout the year.

Grasses normally lose 30% of their roots as part of a natural renewal process. Over grazing forces the grass to use stored energy to regrow new stems and leaves and new roots. After so much over grazing, the grass does not have enough energy to regrow and the plant dies.

Keeping grasses healthy and practicing good grazing management techniques produces the most forage and limit weed problems.

When you start setting up cells, think about how you will get the animals to and from the cell and their access to water while in the cell. You can expect to see more damage to areas around fences, gates and water tanks. That’s just animal nature to congregate in these areas. To keep mud down in these areas, you can use mulch, sand or plant an annual cover crop.

You need to replant this periodically as it decomposes, gets pressed into the soil or is consumed.

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When you start grazing in the spring, it is best to start in a different cell each spring. This allows the first cell grazed the previous year the maximum amount of time to recover before being grazed. In late summer, remove the animals from the pastures for about 4 - 6 weeks and keep them in a dry lot to allow the grass time to store energy reserves for the winter and spring regrowth. Once the grass is dormant and brown, the animals can graze the dry material. Maintaining stubble at all times even in winter is critical to grass survival. If animals are beginning to graze all the way down to the crowns, they need to be removed from the pasture. You don't want the grass crown with the buds to be damaged plus most of the energy is stored in the lower portion of the stem (tiller). In late winter, start watching for the first green leaves. Once you spot new growth (usually late February into March), the animals must be kept off the pasture until it is 6 – 8" tall (species dependent) and had at least 28 days' rest.

The objective of managing grazing is to encourage your animals to evenly graze all the grass in a cell, if you notice that they are not doing this then your cell is too large. If they are grazing the grass lower than your target height in 7 – 10 days, then the cell is too small. By keeping the cells as small as possible encourages animals to graze all forage species. Never let the animals out on the pasture when it is wet and muddy or icy as they can injure the grass or themselves and compact the soil.

## **Estimating the Carrying Capacity**

There is no standard reference on the amount of available forages for different pastures in the intermountain west due to the variability of soils and climate. Dryland pastures in most Colorado counties typically range from 300-2000 pounds per acre in total usable dry matter per year. Irrigated pastures range from 2000-6000 pounds per acre per year. Typically, dryland in most counties produces 1000 pounds, decreasing as you go toward more arid environments in the west. Thus, a typical dryland pasture has at a maximum 500 pounds of usable forage per acre per year. Of these useable 500 pounds, livestock waste some of the 500 pounds by trampling or defecating on it. So, you may have only 350 pounds of usable forage per acre per year. To determine how much forage you are producing, allow an area to grow without grazing for a full growing season, clip a small area of mature grass representative of the pasture, and weigh it after allowing it to air dry for three or four days. For example, if you clip 100 sf (10'X10'), multiply the pounds by 435.6 to get pounds per acre.

- Grazing animals need 2-3% of their body weight of air-dried forage daily. A 1000-pound cow needs approximately 25 pounds of air-dried forage a day or 750 pounds of dry forage per month. A 1000-pound cow needs 1.5 (or almost 2) acres per month.
  - Horses are the same, but they tend to waste and trample more forage, and 3-4% of their body weight per day is more typical.
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# AGRICULTURE

- Sheep need 2-3% of their body weight; however, they utilize a higher percentage of brush species and forbs than cattle or horses.
- Goats prefer forbs (broad leaf plants) over grasses.
- Llamas tend to have slightly more efficient digestive systems and require only 1.8-2% of their body weight of air-dried forage daily.

To estimate the total carrying capacity of a pasture take the estimated air-dried forage production divided by 2 times the number of acres:

Estimated air-dried forage production divided by 2 x Number of Acres

This is the total available production of the pasture that will sustain the existing desirable vegetation.

Then calculate the needed forage to sustain all the animals for a day. Next divide forage availability by forage need to discover the amount of days the pasture can sustain grazing during the growing season.

Forage availability divided by Needed Forage

## **Drylot/Sacrifice Area**

Any grazing management system must include a sacrifice or dry lot area. Livestock are kept in the sacrifice area when the pasture is not ready for grazing or needs rest. The sacrifice area should be located so that it stays as dry as possible and the runoff does not contaminate a well, stream or other water body. The sacrifice area should allow enough square feet per animal based on the species.

Dairy cattle – 600 sq. ft.

Horse – 400 – 500 sq. ft.

Beef cattle – 500 sq. ft.

Goat, sheep – 25 sq. ft.



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# AGRICULTURE

## References:

Colorado Forage Guide

<https://sam.extension.colostate.edu/wp-content/uploads/sites/2/2016/07/forage-guide.pdf>

Pastureland Management Guide Sheet Dryland Pasture Condition Assessment and Guidelines for Colorado Small Acreages

<https://sam.extension.colostate.edu/wp-content/uploads/sites/2/2018/07/GrazingGuide.pdf>

Grass Growth and Response to Grazing, CSU Extension Fact Sheet #6.108

<https://extension.colostate.edu/topic-areas/natural-resources/grass-growth-and-response-to-grazing-6-108/>

National Center for Appropriate Technology (NCAT) ATTRA Resources

<https://attra.ncat.org/publications/attra-publications/livestock-pasture/pasture-rangeland-and-grazing-management/page/3/>

Nation Center for Appropriate Technology ATTRA Resources

<https://attra.ncat.org/livestock-and-pasture/>

The Pasture Project

<http://pastureproject.org/>

Dryland Pastures in Montana and Wyoming

<http://animalrange.montana.edu/documents/extension/EB0019.pdf>



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# AGRICULTURE

## Hay Production

Hay is one of the most common crops raised in Colorado. Alfalfa, grass or a mix of the two are the three basic types of hay grown in the county and state.

### **Alfalfa**

Alfalfa can be grown in a wide range of soil and climatic conditions. Alfalfa is a deep-rooted perennial and is best adapted to deep, well-drained loamy soils. Poor drainage promotes root and crown diseases, inhibits nitrogen fixation and reduces winter survival. Alfalfa is relatively drought-tolerant; however, forage production will be in proportion to the amount of available water. Alfalfa is grown as an irrigated crop in Boulder County. Alfalfa stands can last 10 years or longer, but normal productive life is 7 years.

A soil test for nitrogen and phosphorus should be done prior to seeding to ensure adequate fertilizer is applied if needed. Fertilizer is commonly applied to alfalfa during establishment. It takes at least one growing season for a stand to become established. To maximize forage quality and ensure adequate root reserves for re-growth, cut alfalfa when the crop is in the late-bud to 1/10-bloom stage. This provides adequate time for plant recovery during each cycle of re-growth, creating a healthier and longer-lived stand. As with grasses, leaving a stubble of 3" allows for quicker regrowth than cutting to the ground.

One of the main harmful pests in alfalfa are blister beetles. They cause blistering of both internal and external body tissues of livestock. The beetle's bodies contain the chemical compound cantharidin, an irritant that causes tissue blistering. The ways to minimize blister beetle problems are cutting the alfalfa prior to 10% bloom (the blossoms attract the beetles), use a scycle bar mower and do not crimp the alfalfa (may crush the beetles which releases the irritating chemical), bale in small bales (you can remove sections that contain beetles) and allow the beetles time to escape the hay prior to baling.



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## **Grass Hay**

Native grasses produce less forage than introduced pasture grasses. Dryland/non-irrigated grass hay fields typically produce only one crop per year, depending on location and available water. Dryland grass hay yields from 0.5 to 1.5 tons per acre. Irrigated hay fields produce 2-4 tons per acre.

Introduced grasses (i.e. smooth brome, crested wheatgrass, orchardgrass and meadow brome) can produce more forage than native grasses. However, they normally require more water to produce the additional forage and can be less hardy during drought conditions. Most pastures and hay fields in the county are predominantly smooth brome. Timothy is only practical in higher mountain areas as it does not do well in higher temperatures.

Grass hay is normally harvested from June through August. Harvesting later in the year increases yield slightly. However, nutritional content decreases the later the hay is harvested. For optimal production, grass hay should be harvested just when the grass is starting send out the flower (known as the boot stage). The grass is at its highest protein level at this point. It is usually not feasible for small farms to own all their own haying equipment; thus, sharing equipment with a neighbor or having the hay custom harvested is very common. Custom haying is done on a cash or cost share basis.



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## **Irrigation Water Quality**

Irrigation water with high salinity levels may be a problem in some areas. Using excessively saline irrigation water can stunt plant growth and increase the total soil salt content. Plants watered with highly saline water tend to wilt, even though they appear to be receiving enough irrigation water. Too much salt in irrigation water prevents enough water from being absorbed by the roots. It is important to understand the salinity, electrical conductivity (EC), and total dissolved solids in your water. Your water can also be tested to determine whether it contains concentrations of other potentially harmful constituents. Under some conditions, irrigation water with a high pH (8 or higher) may also limit the nutrient availability of the soil. Other elements of potential concern are chloride and boron.

## **Marketing Hay**

There is often strong demand for locally grown hay. An advertisement in the paper, at your local feed store or just word of mouth is all that is usually necessary to find buyers. There are some specialty markets for different hay classes that demand a slight premium, and “horse hay” is such a market. Horse hay (in the buyer’s eyes) needs to have a high percentage of desirable grass such as orchardgrass, have absolutely no mold, and shouldn’t have been rained on between cutting and baling. Packaging the hay in small square bales (50 - 80 lbs.) versus large round or square bales (500-1500 lbs.) caters more directly to the small acreage or horse market. Large bales are usually discounted as they are harder for small livestock and horse operators to handle.

Another hay market is “certified weed free.” Weed free entails a field inspection prior to cutting to ensure there are no noxious weeds at certain growth stages in the field. Weed free bales are marked with special color twine (blue and orange). Many federal land agencies (i.e. National Parks) require only weed-free hay on all federal lands. Other unique markets include “organically grown” hay and “dairy quality” alfalfa. Contact the Colorado Department of Agriculture (CDA) for information on the process to get your crop certified weed-free or organic. The CDA produces a hay directory each year which provides an additional marketing option.

Hay prices vary throughout the year but tend to be lowest in late summer (just after harvest) and highest in mid and late winter. As with all agricultural commodities, prices for hay fluctuate due to supply and demand, which can be affected by drought, late or early frost, etc.

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# AGRICULTURE

## References:

Colorado Forage Guide

<https://sam.extension.colostate.edu/wp-content/uploads/sites/2/2016/07/forage-guide.pdf>

Livestock Management

[www.ext.colostate.edu/sam/livestock.pdf](http://www.ext.colostate.edu/sam/livestock.pdf)

Fertilizing Mountain Meadows, CSU Extension Fact Sheet #0.535

<https://extension.colostate.edu/topic-areas/agriculture/fertilizing-mountain-meadows-0-535/>

Soil Sampling, CSU Extension Fact Sheet #0.500

<https://extension.colostate.edu/topic-areas/agriculture/soil-sampling-0-500/>

Soil Testing, CSU Extension Fact Sheet #0.501

<https://extension.colostate.edu/topic-areas/agriculture/soil-testing-0-501/>

Soil Test Explanation, CSU Extension Fact Sheet #0.502

<https://extension.colostate.edu/topic-areas/agriculture/soil-test-explanation-0-502/>

Grass Growth and Response to Grazing, CSU Extension Fact Sheet #6.108

<https://extension.colostate.edu/topic-areas/natural-resources/grass-growth-and-response-to-grazing-6-108/>

Managing Small Acreage Pastures During and After Drought, CSU Extension Fact Sheet #6.112

<https://extension.colostate.edu/topic-areas/natural-resources/managing-small-acreage-pastures-during-and-after-drought-6-112/>

Colorado Department of Agriculture Weed Free Forage

<https://www.colorado.gov/pacific/agconservation/ConservationContactUs#WeedFreeContact>

Colorado Hay Directory

<https://colorado.gov/agmarkets>

Colorado Hay Resources

<https://www.colorado.gov/pacific/agmarkets/hay-resources>

Blister Beetles in Forage

Crops, CSU Extension Factsheet No. 5.524

<https://extension.colostate.edu/topic-areas/insects/blister-beetles-in-forage-crops-5-524/>

Colorado State University Agriculture and Business Management website

<http://www.wr.colostate.edu/ABM/>

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# AGRICULTURE

## Seeding or Reseeding a Pasture

Whether you are converting a crop field to a perennial pasture or renovating an old or severely over grazed pasture, there are certain steps you need to take to be successful.

- Do you have a plan for the area you are reseeding? Grazing, haying or a natural area. Knowing what you want to do with the area and your property's physical attributes determines what species can be planted.
- What condition is your soil in? Do you have a soil compaction layer that you need to break up? Is your soil lacking in a specific nutrient? If you do, take the steps to relieve the compaction prior to reseeding. This can be accomplished by either tillage (i.e. aerating, subsoiling) or planting cover crops that are designed to break up compaction (i.e. those that contain daikon radishes, turnips and sunflowers). Be careful when fertilizing prior to seeding. Weeds take advantage of nitrogen, so you may want to wait until the grass is up and growing before fertilizing with nitrogen.
- Do you have weeds? Managing and minimizing weeds prior to reseeding reduces the competition and improves the chances for success. Cover crops can be used to compete with weeds and allow for other weed management methods while protecting and building soil health.

### **Planting Alfalfa**

Seed beds need to be firm prior to planting, which can be accomplished by using a cultipacker or packer wheels on the drill seeder. Poor seed bed preparation is the most common reason for establishment failure. Alfalfa should be planted in the spring around April 1 or in the fall prior to September 1. If planting in the fall you need enough growth so that the plants are large enough to survive the frost. Most alfalfa is grown under irrigation although you can try to grow it dryland.

### **Planting Grass Hay**

Depending on your elevation, our seeding window for grasses is between October 15 to May 15 at higher elevations and November 1 to April 30 on the plains. Fall is often a good time to plant as weather conditions are usually drier and landowners may have more time to do seeding than in the spring. Fall planting is considered dormant seeding, meaning the grass won't germinate until spring. The seed is absorbing moisture and vernalizing, so it is ready to germinate when the conditions are right in the spring. Spring often brings late snows and rains that keep fields muddy until the seeding window is past. Soil preparation is a critical step. If you don't have to till your soil to relieve soil compaction, you may not want to do any tillage. Tilling the soil disturbs the soil structure and brings up buried weed seeds which you need to manage prior to planting. Whether you have soil compaction or not make sure that you have a firm seedbed prior to planting.

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Choose your grass seed mix based on your site conditions, soils, desired outcome (i.e. hay grazing/natural area) and irrigation water available. Your local seed dealer, NRCS or CSU Extension office can help determine the species for your mix. Most seed dealers have standard mixes for various soil conditions and uses.

There are different ways to spread the grass seed – broadcast and drill seeding. To broadcast seed, you use a rake (for small areas) or a harrow (chain like device with spikes or a board or chain link fence weighed down, basically anything that can roughen up the soil) behind a garden tractor/ATV to roughen up the soil. Spread the seed out by hand or use a seeder (normally at a rate of 25 seeds per square foot) then come back with the rake or harrow or whatever device you have to make sure you have good seed to soil contact and at least part of the seed buried between  $\frac{1}{4}$  and  $\frac{1}{2}$ " deep. This means that you will see some seed on the soil surface. Therefore, you need to purchase twice the amount of seed if you broadcast seed. If you get the grass seed deeper, it still germinates but does not have enough energy to grow enough to emerge.

Drill seeding is another option. This utilizes a drill like a grain drill to plant the grass seed.

The drill precisely places the seed at the  $\frac{1}{4}$  to  $\frac{1}{2}$ " depth so you can purchase less seed than broadcast seeding. You cannot use a grain drill to plant grass seed as it can't be adjusted to plant the grass seed at the correct depth. Drill seeding cannot be used in rocky areas as the rocks damages the drill. Grass seed takes 2 – 6 weeks to germinate. A newly seeded area will look weedy for the first several years until the grasses are well established.

If you have a couple of seedlings per square foot the first year, you have a good start.

Establishing grasses can take 3 – 5 years before they really start to look established.

Depending on conditions, not all grass seed may germinate the first year. Waiting at least 2 years before you consider seeding again can save time and money. Initially until the grass is established, you will only be able to mow, or hand pull any weeds that come up. Once the grass is established (it has at least 5 leaves) you can use synthetic herbicides. Seeding takes time and patience.



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## References:

Five Keys to Successful Grass Seeding, NRCS

[https://www.nrcs.usda.gov/Internet/FSE\\_PLANTMATERIALS/publications/ndpmcbr04959.pdf](https://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/ndpmcbr04959.pdf)

Establishing Native Grasses, NRCS

[https://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcs142p2\\_017880.pdf](https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_017880.pdf)

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# AGRICULTURE

## Soils

Soils and soil parameters, such as soil type and nutrient levels, can vary within a field and from field to field. These variables affect a wide range of management decisions from building and septic system design to the crop types grown and water use. Colorado soils include heavy clay to well-drained sandy soils encompassing many characteristics including being shallow or deep, deficient or adequate in organic matter content, or high in salts to name a few. To determine the basic soil type on a property, use the NRCS tool “Web Soil Survey”. This tool assists landowners in determining what problems/issues they may have concerning their soil.

### Understanding Soils

#### Inspect Your Soil

A thorough analysis of both the soil’s physical and chemical characteristics is important when developing a new seeding or landscape. Boulder County has a wide variety of soil types, ranging from salty poorly drained clays to well drained rich soils. Each soil has its own unique structure and texture, drainage pattern, pH, nutrient content and need for amendments and fertilizer. While soils are seldom perfect; most of them can be improved in some way to ensure best plant growth. An ideal soil has good aeration and drainage yet holds moisture and nutrients for optimum root growth.

#### Soil Testing

Whether it is a livestock pasture, garden or lawn testing your soil is an excellent initial step.

A soil testing program helps to manage the land and to answer the following questions:

- Are soil nutrients deficient or excessive?
- Which crop fertilizer program is best?
- Does the soil have a salinity or sodic problem, and what effect does that have on the crop?
- What is the pH and organic matter level, and can it be adjusted?

Annual field sampling and testing is recommended for accurate crop and nutrient management. Obtaining a representative soil sample from the testing area is critical for accurate results. To begin, divide the area into areas that are similar in soil type, slope, or other characteristics. For collection, use clean equipment, free of soil particles and rust. Collect 15-20 samples from the top eight to 12 inches of soil in a random or systematic pattern. Mix the samples from a single sample area in a plastic bucket. Collect about two cups of the mixed sample to submit to the laboratory. Nitrogen recommendations for irrigated crops, should include subsoil samples (12 to 24 inches) as well as surface samples to account for the available nitrogen throughout the root zone.

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## Improve the Structure of Poor Soils

Certain native soils, like dense, poorly drained clays, have such poor structure that plant growth suffers unless they are improved. Poorly drained soils can be improved in several ways. Sometimes deep cultivation can be used to break apart a hard layer of soil (hardpan) below the soil surface and improve drainage. On the other hand, sandy soils that tend to dry out rapidly and hold little moisture benefit from organic matter such as aged animal manure or compost, incorporated uniformly throughout. Another option is the use of cover crops. Some cover crops have plant species such as daikon radish, turnips and sunflowers that can assist in breaking up some compaction.

Cover crops are useful in improving soil structure and nutrients. Unfortunately, no cookbook recipe exists for soil improvement. How you treat the soil depends on the characteristics of your soil, the type of plants or crop to be grown.

## Fertilization

The best method to determine your pasture's fertilizer needs is by doing a soil test. If you hay your pasture, you need more nitrogen to replace the vegetation removed even if you use it onsite and spread the manure. If you are just grazing, you need fewer added nutrients.



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## References:

National Center for Appropriate Technology ATTRA Resources

<https://attra.ncat.org/soils/>

Soil Testing. CSU Extension Fact Sheet #0.501

<https://extension.colostate.edu/topic-areas/agriculture/soil-testing-0-501/>

Soil Test Explanation. CSU Extension Fact Sheet #0.502

<https://extension.colostate.edu/topic-areas/agriculture/soil-test-explanation-0-502/>

Soil Sampling. CSU Extension Fact Sheet #0.500

<https://extension.colostate.edu/topic-areas/agriculture/soil-sampling-0-500/>

Managing Saline Soils. CSU Extension Fact Sheet No. 0.503.

<https://extension.colostate.edu/topic-areas/agriculture/managing-saline-soils-0-503/>

Managing Sodic Soils. CSU Extension Factsheet No. 0.504

<https://extension.colostate.edu/topic-areas/agriculture/managing-sodic-soils-0-504/>

Diagnosing Saline and Sodic Soil Problems. CSU Extension Factsheet No. 0.521

<https://extension.colostate.edu/topic-areas/agriculture/diagnosing-saline-and-sodic-soil-problems-0-521/>

Controlling Soil Erosion from Wind, CSU Extension Factsheet No. 0.518

<https://extension.colostate.edu/topic-areas/agriculture/controlling-soil-erosion-from-wind-0-518/>

For more information on soil testing and specific recommendations for the area, contact the Boulder County Extension Office or the CSU Soil, Water, and Plant Testing Lab at 970-491-5061.

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# AGRICULTURE

## Windbreaks



Windbreaks are used to slow windspeeds around homes, farm buildings, corrals, pastures and fields. They can also be used to prevent drifting across access roads and to provide a “living” barn for livestock. They can be used to attract and provide wildlife shelter belts.

Depending on the purpose of your windbreak determines how many rows, plants used and windbreak location. The first step is to determine the prevailing wind direction on your property. This determines windbreak location.

A windbreak can alter wind speeds for up to 10 times the height of the windbreak. When the wind hits the windbreak, the wind is forced upward and is slowed. As the wind speed slows, snow drops out so putting your road right next to your windbreak results in more snow being deposited on the road. The windbreak needs to be placed far enough from the road to allow for the snow deposition. Your local Colorado State Forest Service can help you with design and placement of the windbreak. The Natural Resources Conservation Service and Extension Office can help with design of wildlife shelter belts.

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The Longmont and Boulder Valley Conservation Districts hold a tree sale every year. They sell plants that were grown at the Colorado State Forest Service (CSFS) Nursery in Fort Collins. The plants are small plants that are suitable for both windbreaks and wildlife shelter belts. The smaller plants are easier to plant and will establish quicker than larger plants and are less expensive. They come in individual pots or bundles of 25 bare root plants. Orders are normally taken starting in November until March with plants delivered in April. The nursery sells directly to landowners but you need to pickup the plants at the nursery in Fort Collins.

## References:

Boulder County Extension Small Acreage website “Windbreaks”

<https://boulder.extension.colostate.edu/natural-resources-wildlife-rural-properties-pasture/windbreaks/>

Colorado State Forest Service

<https://csfs.colostate.edu/seedling-tree-nursery/>

<https://csfs.colostate.edu/>



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# AGRICULTURE

## Alternative Agricultural Enterprises



Hobby farming, organic farming, gardening, or small-scale livestock operations have become popular agricultural practices among Boulder County residents. Boulder County has seen an increase in interest and demand for local farm fresh or organically grown products. The Boulder County Farmers Market has become a well-known place to purchase locally grown and produced products. The Farmers Market provides a direct marketing opportunity for local growers and producers. Contact the Farmers Market for more information.

Developing an alternative or specialty agricultural enterprise is usually the result of a desire to pursue a personal interest while also generating an economic return from your land. These agricultural enterprises can take a variety of forms, some examples include: new and different crops (i.e. U pick orchard, berry production) or livestock enterprises, value added products (i.e. cheese, jam), agritourism, recreation or natural and organic production systems, as well as direct marketing strategies through farmers markets, roadside stands, community supported agriculture, and even online delivery.

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# AGRICULTURE

An approach to determining the potential success of an agricultural enterprise involves consideration of key factors including production, marketing, and management. A wise agricultural entrepreneur will need to have a thorough business plan, including an inventory of natural and personal resources, and clear answers to the following:

- Do I have the personal characteristics and business skills to be a successful entrepreneur?
- Do I have the physical resources and capability to consistently produce a quality product?
- Do I have a plan, reliable labor, and financing to handle production considerations?
- Do I have a marketing plan in place to sell my products profitably?

For several products, particularly the value-added types, the processing step is the most challenging. In many instances this is the critical part in adding product differentiation to maximize market potential. In the case of fresh specialty products, planning for post-harvest handling facilities are most important in maintaining product safety and quality and customer satisfaction. Other factors to consider may include: products not being able to be processed on the farm; facilities to safely process the product are not located in the area; and processing facilities requiring larger amount of raw product than currently available.

Identifying local and out of area producers of a particular product is usually the best way to access information regarding processing possibilities. Prospective value-added cottage food producers are encouraged to review Cottage Food Act, SB12-048. Colorado State University Food Processing Support Services provides assistance to cottage food producers.

<https://www.chhs.colostate.edu/fshn/outreach-and-engagement/food-processing-support-services/>

A detailed market assessment is critical in determining the potential profitability of a new agricultural enterprise (see <https://boulder.extension.colostate.edu/agriculture/>) The assessment should include market potential, competitive advantage (product characteristics, pricing, promotion, personnel, product distribution, etc.), and the marketing strategies to reach targeted customers.

Cooperative community efforts, in some cases supported by the local business community, is an example of a potential marketing and promotion strategy that has contributed to the success of agricultural producers selling alternative and specialty crop enterprises. Examples include: commodity festivals like the Olathe Sweet Corn, Cherry Days, October Fest Apple Festival, Pueblo Chili Fest, Rocky Ford Melon Festival, Monte Vista Potato Festival, Palisade Peaches and Palisade Wine Fest. There are also innovative marketing and promotional opportunities through the development of agritourism, bike tours, and U-pick farm fresh operations.

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# AGRICULTURE

The following is a list of potential alternative and specialty agricultural enterprises. This is not an all-inclusive list, but rather examples of common alternative enterprises:

Aquaculture	Ethnic Crops
Beekeeping	Halloween Pumpkins
Specialty Mushrooms	Organic Produce
Specialty Corn	Vermiculture
Specialty Potatoes	Small-Scale Woodlots
Lavender	Herbs
Hops	Wildflowers
Farm Fresh Eggs	Exotic Soaps
Alpacas	Goat Milk
Specialty Wine Grapes	Fresh or Hard Cider
Pasture & Hay	Ornamental Trees & Shrubs
Certified Hay	Turf Grass
Exotic Livestock	Organic Fruits & Vegetables
Specialty Flowers	Grass Fed Livestock
Specialty Garlic	Christmas Trees

## References:

Colorado State University Extension Small Acreage Management

[www.ext.colostate.edu/sam/](http://www.ext.colostate.edu/sam/)

Colorado State University Extension Agriculture & Business Management

[www.coopext.colostate.edu/ABM/index.html](http://www.coopext.colostate.edu/ABM/index.html)

CSU Boulder County Small Farm website

<https://boulder.extension.colostate.edu/agriculture/small-farms/>

How to be Successful at a Farmer's Market, CSU Extension Factsheet No. 4.008

<https://extension.colostate.edu/topic-areas/yard-garden/how-to-be-successful-at-a-farmers-market-4-008/>



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# AGRICULTURE

## Open Space

Within the context of the Boulder County Comprehensive Plan, open space is defined as those lands being intentionally left free from future development, and in which it has been determined that it is or may in the future be, within the public interest to acquire these properties to assure their protection.

- Conservation easements are important land preservation tools in Boulder County. They can be donated by the owner, purchased by the County or some other governmental entity or land preservation organization, or be required as part of the County land development approval process. Easements that are voluntarily given or sold can result in an income tax advantage under the rules of the U.S. Internal Revenue Service. These easements are expressly authorized in Title 38 of the Colorado Revised Statutes and are becoming increasingly common legal mechanism for keeping land in private ownership, while assuring that it is preserved for important open space, wildlife habitat, recreational, scenic or agricultural production purposes. For additional information, read the conservation easements section on page 23.

- Much of the County's Open Space is closed to the public. The main emphasis for open space purchases, by the County is to maintain or improve the well-being of the property. In the case of agricultural or rangeland, this is accomplished through a leaseback program. The program creates an agreement between the land seller and the County, where the seller will continue to farm or manage the property for a negotiated time period. In some cases, the seller has an established lease with another individual who is farming or managing the land. Therefore, the lease with the County could specify that the lessee will stay on the land, under the current lease conditions for a negotiated time period, but the County will take over property ownership after that time. In other situations, the County may purchase and lease land for farming to an interested party. Thus, the leaseback program is not limited to those who have sold agricultural land to the County.

- Boulder County Open Space retains its diversity through ecosystem management. This practice is directed at maintaining all the natural environmental functions rather than managing for a specific species, be it plant or animal. The goal is to maintain intact ecosystem ecological functions to provide a suitable habitat in which the species that live there will persist and flourish. The ecosystem management attempts to increase the diversity – vegetation and wildlife - of Boulder County's Open Space lands. The greater the diversity, the greater the ecosystem health.

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# AGRICULTURE

