





Summer 2019 Issue 42

sam.extension.colostate.edu

Inside this Issue:	
Rabbit Ownership	1
Canada Thistle Rust	4
Rangeland Grass Recovery After Drought	5
Colorado Woody Plants App	7
Gardening Hacks for Extreme Colorado	8
Biodiversity	10
YouTube University	11
Colorado Forest Legacy Program	12

Rabbit Ownership

By Kara Harders, Small Acreage Specialist, NRCS/CSU Extension

Domestic rabbits can be raised for a variety of uses including wool production, fur production, meat production, lab animals, and show animals. With over 49 recognized breeds in the US, there are an assortment of rabbits for every use!

Some of the more common breeds include Angora (used for wool production), New Zealand

Whites (used for meat production), and American Chinchilla (used for fur production). Raising rabbits is a good option for small acreages because it doesn't take much space. Typical weights range from small (3-4 pounds), medium (9-12 pounds), and large (14-16 pounds). Each doe can produce 25-50 rabbits per year.

Continued on page 2

Colorado Sustainable Small Acreage News is published and edited by Jennifer Cook,
Small Acreage Management Coordinator, NRCS/CSU Extension, 57 West Bromley Lane, Brighton, CO 80601
720-634-3927 jennifer.cook@colostate.edu

Please direct all inquiries regarding this publication to Jennifer Cook.

Colorado State University Extension and U.S. Department of Agriculture programs are available to all without discrimination. Colorado State University Extension, U.S. Department of Agriculture and Colorado counties cooperating.

Rabbits from page 1

If you are new to rabbit ownership, it is important to keep in mind that your rabbit is not the same as wild cottontails or hares in your area. Much like a coyote and a Dachshund have different needs, so do domestic and wild rabbits. Domestic rabbits have not had thousands of years to adapt their genetics to the climate they live in. Unlike wild rabbits, domestic rabbits do not have the ability to seek out cooler places in the summer and warmer shelters in the winter.

Regardless of the intended use of domesticated rabbits, it is critical to understand what rabbits need to be healthy and safe. While rabbits can be relatively easy to care for, be sure to provide proper housing, feeding, and maintenance to avoid major problems.

Housing

- To prevent fighting and cannibalism, rabbits must be caged separately, unless both rabbits are spayed/neutered. This absolutely includes siblings over twelve-weeks old.
- A rabbit's home should be at least 4-6 times the size of the rabbit, and bigger is always better if it is possible. The animal should be able to stand up.
- Rabbit housing should provide protection from elements (sun and cold) and have good ventilation. Rabbits do not tolerate extreme hot or cold.
- If a hutch is outside, be mindful of extreme hot and cold. Also provide a place for the rabbit to hide from predators looking in the cage.
- Rabbits like to chew on things to keep their teeth healthy. Provide untreated wood blocks for this purpose.
- If cages have all-wire flooring, prevent sore hocks on the rabbit's feet by providing a board for the animal to sit and lay on.
- A nest box should be placed in the hutch prior to birthing to provide seclusion for the doe and protection for the litter.

Feeding

Rabbits need a diet high in fiber to keep their gut bacteria healthy. They are naturally extreme browsers and would choose to munch on a variety of plants and roots if given the opportunity. Pelleted rabbit food contains a blend of the needed vitamins and minerals to keep rabbits healthy.

Some things to add to the pelleted diet could be:

- Mineral/salt licks
- Timothy hay
- Fresh fruits and veggies in moderation. Research any treats you want to give to make sure they are rabbit safe! Avoid treats that are high calories, especially sugars and fats, and avoid those that causes gas such as broccoli, cabbage, and cauliflower. Give treats in moderation.
- Fresh water should always be available!

Continued on page 3



Angora rabbits produce about 8-10 inches of wool (12-16 ounces) per year.

Rabbits from page 2

Other Important Tips

Lifespan – It is not unheard-of for a domestic rabbit to live ten years or more, especially if kept as a pet.

Grooming – Unless the rabbit is a wool breed, they will not need regular brushing.

Nails will need trimming a few times a year.

Breeding – Breeding rabbits can be rewarding, heartbreaking, and frustrating. Research the process well and have a plan for the baby rabbits, called kits. Before you breed, have a market identified.



Marketing – Have a plan. Housing extra rabbits you couldn't find homes for will consume time, space, and money. Raise rabbits for meat, laboratory use, breeding stock, Angora wool, skins, or youth programs (4-H and FFA). Look for buyers such as restaurants, wholesalers, custom meat stores, and individuals. Consider availability of slaughter facilities and packaging requirements for meat. Colorado Department of Agriculture regulates the slaughter and sale of meat. Direct to consumer sales differ from retail sale requirements. More details are listed here - https://cofarmtomarket.com/value-added-products/meat-2/

Biosecurity – Rabbits are susceptible to several diseases such as *Pasturella multocida*, *a* respiratory disease. To prevent diseases, clean cages regularly, isolate sick rabbits, limit unnecessary visitors inside the rabbitry, and keep good records.

Resources for Further information:

ARBA.net (American Rabbit Breeders Association)

Rabbit Production, Penn State Extension - general production, breeds, budget, and other considerations: https://extension.psu.edu/rabbit-production

Backyard Production of Meat Rabbits in Maine, University of Maine Extension https:// extension.umaine.edu/publications/1044e/

Rabbit Industry Profile, USDA-APHIS - it is extensive and from 2002 but could provide some good insight if you are seriously considering getting into rabbit production:

https://www.aphis.usda.gov/animal_health/ emergingissues/downloads/RabbitReport1.pdf

Bennett, B. (2018). Storey's Guide to Raising Rabbits (5th ed.). North Adams, MA: Storey Publishing.



Canada Thistle Rust

By John Kaltenbach, Palisade Insectary, Co Dept of Agriculture

Canada thistle (*Cirsium arvense*) is reported as the most abundant List B species in Colorado (EDDMapS: 33,029 records reported infesting approximately 159,758 Acres). It occurs in varied land types across the state and its extensive root system and ability to reproduce vegetatively makes it particularly difficult to control.

Canada thistle is an ideal candidate for biological control because, as chemical control of Canada thistle can be difficult to spray in natural or riparian areas, and it is often necessary to apply herbicide over multiple years to achieve effective control.

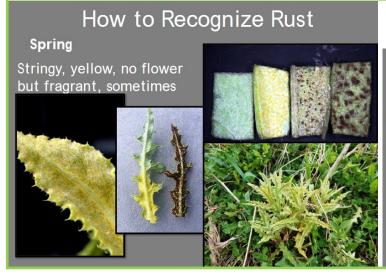
Since 2013, the Colorado Department of Agriculture's Palisade Insectary has been working on how to utilize a host-specific pathogenic rust fungus, *Puccinia punctiformis* (CT rust) to control Canada thistle. The CT rust is adventive (not intentionally introduced) and has appeared around the world where Canada thistle occurs, most likely having arrived in the root stalks of early infestations. In Colorado, CT rust has been identified at more than 50 sites.

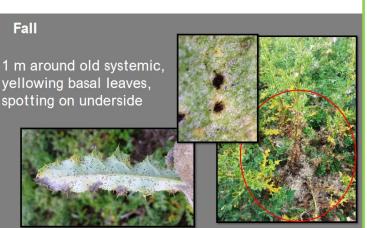
Prior to the work in Colorado, it had been documented that CT rust would kill its host. However, to

make it an effective biological control agent we had to overcome the difficulty in getting it established in a thistle patch. We have now developed effective protocols for harvesting, processing and establishing CT rust as a systemic infection in the roots. We have seen a 50 percent average stem density reduction in our monitoring transects at 30 months after inoculation. Results will vary depending on how well established the weed is (both patch size and density, the extent of root system and competition from other vegetation).

The best time to identify if CT rust is present (already there or after inoculation) is to scout in the spring when diseased Canada thistle shoots emerge. The plants will appear unusually tall, light green, and the undersides of the leaves will be covered with yellow spermagonia (spores) that have a fragrant flower-like scent.

If you are interesting in obtaining CT rust, please contact the Palisade Insectary at 1-866-324-2963 or visit our website https://www.colorado.gov/agconservation/biocontrol





Rangeland Grass Recovery After Drought

By Retta Bruegger, CSU Extension Range Management Specialist, CSU Extension

Rangelands, or dryland pasture, are typically dominated by native plants, unirrigated, unfertilized, and are unpredictable compared to other agricultural lands. Given these factors, managing grazing well is one of the few tools we have in order to ensure continued productivity.

What happens to plants during drought?

A severe drought can kill grasses, especially among cool season grasses at lower elevations¹, but it takes a while. In studies from southeastern Utah near Moab^{1; 2} researchers imposed sustained reduction in precipitation over four years on native range by building shelters that blocked rainfall, reducing precipitation by 35 percent on treated plots from 2011 - 2014. Researchers compare these to similar plots *not* under rain-out conditions. During this period, the drought of 2012 occurred, which allowed researchers to look at the effects of a severe drought in combination with sustained reduced precipitation.

They found that cool season grass mortality was greater than 50 percent over four years in the treatment plots, and around 30 percent in plots that *only experienced the 2012 drought*. In plots that experienced *only* the 2012 drought, 54percent of the plants that died did so in 2013, the year following the 2012 drought.

In many parts of western Colorado, 2018 was as severe if not more severe than 2012, so we can expect that at lower elevations, cool-season grasses may be severely impacted by last year's drought and some probably died off, lowering overall forage production.

What about drought AND grazing?

Timing of grazing, intensity of grazing, and grazing management going back several years, appears to matter in terms of post-drought recovery and re-

sistance to invasion^{3; 4}. In an eight-year study near Flagstaff, AZ, plots submitted to intensive grazing from

1997-2002 showed a dramatic leap in cheatgrass after the 2002 drought, compared to plots that were grazed moderately for the same period (by moderately, they mean less than 50 percent of grass production removed by grazing).

In the intensive grazing plots, 200 cow/calf pairs per hectare per year grazed for approximately 12 hours. In these plots, no grazing occurred in 2002 and despite this, cheatgrass jumped from being present in 40 percent of samples in 2001 to in 80 percent of samples in 2003 in the intensive treatment. In the moderately grazed plots, cheatgrass showed up in less than 50 percent of the quadrats in 2003 after the 2002 drought.

This study found that sustained heavy grazing, year after year, makes grass plants vulnerable in drought, even when cattle are removed during the drought itself, and even when cattle are only on a plot temporarily each year (in this case, 12 hours per year).

It's like saving for retirement. The best time to start managing for rangeland health was yesterday, and if plants are weakened by years of overuse, you may already be on a trajectory when drought hits.

Continued on page 6



Grasses and Drought continued from page 5

Intensity and timing of grazing play a role in recovery and vulnerability of grasses.

In a multi-year study in southern New Mexico³, researchers applied double the amount of recommended grazing pressure (removing 65-80 percent of aboveground perennial bunchgrass biomass, to a stubble height of two inches for four years – 1996-2001). Researchers applied this treatment to some plots during the summer, and in other plots during the winter, to test the relative impact of grazing heavily at different times of the year. In 2002, all plots were rested from grazing until 2009 and researchers continued to observe the plots until 2009.

investment you can make as a land steward. Prevention is much less expensive than reversal.

If you don't already have a drought plan, check out resources <u>here</u> and consider these strategies:

- Store grass in preparation for a drought (i.e., rest pastures)
- Know how much your land produces in terms of forage in dry and normal years, relative to your forage demand.
- Build flexibility into grazing in other ways (lower stocking rates, retain fewer heifers, lease lands)
- Plan ahead and think about triggers
- Know more about your lands than anyone else and use this in your management.

It's like saving for retirement. The best time to start managing for rangeland health was yesterday, and if plants are weakened by years of overuse, you may already be on a trajectory when drought hits.

Heavy defoliation during the dormant season (winter) resulted in sustained lower and slower recovery of native bunchgrasses³ compared with the summer grazing treatment. Residual leaf area is one of the most reliable indicators for predicting recovery of grass species⁵. When residual leaf area was severely damaged and that plant was exposed for a long period before growth started again, grass recovered much slower.

In drought and not in drought, residual leaf area is important to survival of a grass plant. Winter grazing might not be as benign as previously thought, and significantly reduced cover can have lasting impacts. In most of Colorado, the spring was wet and temperatures were low, perfect for cool season grasses. That said, if for the past 10 years, you've been using a pasture or rangeland at greater than 50 percent use, this year is an opportunity to 'invest' in the vigor of cool season grasses by grazing more conservatively.

The bottom line: hoping for rain is not a drought management strategy. Proactive management before a drought is the best ecological and economic

Citations

- 1) Hoover, D. L., M. C. Duniway, and J. Belnap. 2015. Pulse-drought atop press-drought: unexpected plant responses and implications for dryland ecosystems. *Oecologia* 179:1211-1221.
- 2) Hoover, D. L., M. C. Duniway, and J. Belnap. 2017. Testing the apparent resistance of three dominant plants to chronic drought on the Colorado Plateau. *Journal of Ecology* 105:152-162.
- 3) Bestelmeyer, B. T., M. C. Duniway, D. K. James, L. M. Burkett, and K. M. Havstad. 2013. A test of critical thresholds and their indicators in a desertification-prone ecosystem: more resilience than we thought. *Ecology Letters* 16:339-345.
- 4) Loeser, M. R., T. D. Sisk, and T. E. Crews. 2007. Impact of grazing intensity during drought in an Arizona grassland. *Conservation Biology* 21:87-97.
- 5) Briske, D., and J. Richards. 1994. Physiological responses of individual plants to grazing: current status and ecological significance. *Ecological implications of livestock herbivory in the west. Society for Range Management, Denver, CO*:147-176.

Colorado Woody Plants App

The free Colorado Woody Plant App is Live! With the launch of the app, Colorado's wide-range of shrubs, trees, cacti, and woody plants are easier than ever to identify.

Download the app on iOS, Android, or Google Play by searching "CO Woody Plant".



Feature of the app

In addition to a comprehensive library of plant knowledge, the CO Woody Plants app features an innovative search platform that allows the user to search by plant characteristics or name, as well as a favorites section to flag plant data that is most relevant.

The app has the ability to download plant data to allow searchability in offline locations without cellular connection. When you open the App, click on the last button "Update Offline Plant Data" so you're not pulling from your data or from Wi-Fi, so you can use it in the field without needing to be connected.



CSU Online Land Stewardship Short Courses

Take one or all of these self-paced online courses, developed for the Colorado-arid west soil and climatic conditions.

Stewardship Planning—\$40
Soils—The Basics—\$50
Water—The Basics —\$50
Management of Forage Plants—\$50
Management of Invasive and Noxious Weeds—\$50

Emergency Preparedness—\$50

Management of Wildlife in Colorado—\$50

*Discounts for bundling classes

Each class aims to help small acreage audiences and takes 5—10 hours to complete at your own pace.

Participants will gain a better understanding of natural resources, localized land strategies, and build an effective long-term land management plan for their property.

More info and register here www.online.colostate.edu/badges/landstewardship/

Gardening Hacks for Extreme Colorado

By Jennifer Cook, CSU Extension/USDA-NRCS

The Colorado climate has many advantages for growing. Little humidity and lots of sun reduce the number of diseases and pests to contend with. But wind, hail, wildlife, high elevations, and limited water challenge even the most experienced of gardeners. Here are some easy and fairly cheap strategies to help us beat these challenges.

Floating Row Covers

These lightweight breathable fabrics come in various thicknesses and will offer frost, hail, and wind protection. Use floating row covers at the beginning and the end of the season to protect plants from frost damage, by providing a few degrees of warming depending on the thickness. The row covers don't need any support, just tie them down with rocks, staples, stakes, or sandbags. Make sure they are secured tightly, especially if you are using the fabric to prevent wind damage. Hoop frames can also add additional protection from hail.

In addition, floating row covers can reduce wildlife browsing on your salad greens and vegies. Elk, deer, moose, rabbits, and chipmunks sniff at the beds, but they can't get inside the row covers to eat anything. Does anyone have trouble with flea beetles, grass-

Exclude critters by putting wire protection on the bottom of beds. Washington Dept. of Fish and Wildlife, drawing by Jennifer Rees. hoppers, or other bugs in your garden? Floating row cover will also prevent insects from eating away at your crops.

Floating row covers seems to solve a lot of challenges! One thing to remember though is that tomatoes, peppers, eggplant, squash, and tomatillos need wind or bee agitation to transfer pollen. These plants should be uncovered for pollination once they flower. Also uncover plants you are growing for harvesting seeds. But plants like beets, salad greens, beans, and peas can stay covered for the whole



Floating row covers are a great tool for gardeners.

growing season if needed because they self-pollinate easily.

For some reason, I don't see floating row covers in garden stores, but they can be purchased in rolls online, such as from Johnnie's Select Seed Company. Shop around for the best prices as they can be pricey. Also consider what thickness you want based on your needs. Agribon19 is what I use.

Small Hoops or Low Tunnels

Adding hoops to form a low tunnel will add additional frost protection (2-6 degrees F) and can add two to six weeks on each end of the growing season. Combine hoops with floating row covers for even more frost protection. **Continued on page 9**





Low tunnels add additional hail, wind, and frost protection.

Garden Hacks from page 8

Make hoop frames out of PVC pipes, 6-or 9-gauge wire, or bent electrical conduit. Cover the frames with 6 mil UV-resistant plastic, which should last 3-5 years. The plastic must be held up off plants, as plants will freeze where touched by the plastic. Use clips or clamps to keep plastic taut and in place around the hoops, and weight the sides down with sandbags or rocks.

Don't forget to vent your plastic tunnel on sunny days to prevent overheating. They do make slitted plastic covers which automatically ventilate, but these provide less cold protection.

Hardwire Cloth

Hardwire cloth, or wire mesh will prevent pocket gophers from entering your garden. The wires must be no more than ¼" apart. It is easiest to install if you are building raised beds, simply add the hardwire at the bottom and sides of the beds. Purchase hardwire mesh at any hardware store.

Waffle Gardens

Just as the shape of a waffle collects butter and syrup in the depressions, you can shape your garden bed to collect and hold water. This technique was developed by native American Zuni **Continued on page 10**



Waffle gardens can help save water.



Rainwater is directed from house downspouts into the garden.

Garden Hacks from page 9

in New Mexico to grow crops with variable water conditions. Make small mounds or berms in the shape of squares, one foot or larger, and plant your crops in the depressions. Plants can be denser than normal to shade the soil and deter weeds. The squares will hold water and prevent run-off, conserving our precious water.

Harvest Rainwater

As of August 2016, Coloradoans can collect in rain barrels, up to 110 gallons of rain water off a single family (or up to 4-family unit) residence. Supplement the rain barrel water by directing overflow rainwater into the garden with berms and hoses.

Follow @Colorado Stewardship on Instagram and Facebook

Upcoming focus
Organic and Conventional Weed Control Methods



Biodiversity

By B. Guercioni, Pawnee Buttes Seed Company

What is Biodiversity and how does it impact us? Biodiversity is the diversity of life on Earth, including all living things in the air, water, soils, and deserts. This diversity of life is continuously changing over time and may be accelerated by rapid changes such as fire, flood, or human intervention (i.e. agricultural development or metropolitan development). These changes involve all of us because we are part of this living biodiversity on Earth.

When external factors act upon an ecosystem, the living relationship between all things in that environment are at risk of changing. A change or reduction in biodiversity can have negative impacts on plants and animals (both wild and domesticated) which depend on that habitat. For example, a weed infestation will impact the relationship of plants and animals already found within that environment by displacing them, perhaps eliminating valuable food sources and habitat for endemic birds and wildlife.

The way in which we manage our land has a wide sweeping effect on biodiversity. Overgrazed grasses that were once used as a source of forage may die off and become displaced by competing shrubs and **Continued on page 11**



Colorado's biodiversity is immense, even in dryland prairie ecosystems.

Biodiversity from page 10

ungrazed grasses of a lower nutritional value. Encroaching plants may use more water impacting the local watershed. Shifts in biodiversity may affect the fertility of the soil, as well as the rate of soil erosion.

If you are interested in learning more about biodiversity and how land managers can adapt to these unexpected changes, join Pawnee Buttes Seed for the 2019 Annual Grass Tour. The 2019 Grass Tour will be hosted by Lonesome Pines Land & Cattle Co. in Grover Colorado, August 15th and 16th. Topics for discussion include the Five Pillars of Ranch Management, Biodiversity and the Effects of CO2 on the Quantity and Quality of Plant Life, Variations in Plant Photosynthetic Cycles (C3, C4, CAM), Mycorrhizal Fungi, Soil Health and more!

Register for the 2019 Grass Tour here - https://www.eventbrite.com/e/2019-grass-tour-tickets-63912439828?aff=ebdssbdestsearch



YouTube University

By Kara Harders, Small Acreage Specialist, CSU Extension/NRCS

It is amazing how much educational material is on YouTube today. Things we would have needed textbooks, experts, and manuals for are so easily found and learned on the video platform. I used it to find an expert to teach me when to use para vs por when learning Spanish, when I'm struggling to program my thermostat in a new house, how to change a sensor on my vehicle, or troubleshooting issues on a car channel. But the thing all these topics have in common is they are universal. The process of programming the confusing thermostat is the same in Florida as it is in Alaska. A fan sensor on a specific make and model of car is the same all over the world. Para and por are consistent (I think?) everywhere Spanish is spoken.

A topic that is not consistent is agriculture.

A new farmer or homesteader usually wants to learn as much about successful practices as possible, and that is awesome. But learning a concept or practice from a farmer or homesteader in North Carolina or Minnesota will not always apply to land in Colorado. So many critical factors are different. Soil pH, rainfall/snowfall, average highs and lows, frost-free days, tendencies of late season frosts, organic matter in the soil, microbial communities in the soil, elevation, humidity, wildlife populations, native plant populations and more. So why would our agricultural practices be the same?

Practices such as mob grazing are much easier to do correctly when the area receives 40 inches of rain. Here is Colorado, we average only 12 inches. Organic materials such as woods, grasses, and decaying animals return to the soil as available nutrients much more rapidly in other regions of the country where moisture is more abundant. Even something as simple as how tight fencing is strung is different **Continued on page 12**

YouTube University from page 11

in areas that get very cold because tight fence will contract when cold and is more likely to snap.

Colorado is a state that observes the ways of the central west, but even when grouped with Wyoming, Utah, Kansas, New Mexico, and North Texas things can be a bit different here. An example is the magical micro-climate of Palisade, CO. It grows fruits like peaches, grapes, and cherries in exceptional ways, ways that certainly couldn't be replicated in Eastern CO.

YouTube is still an excellent resource for learning new practices, but try to find channels from agriculturalists in our region or look for information that is universal, such as when a fruit or vegetable is considered ripe, or correct moisture content for harvested grains. A safe bet is to try to find local university-based videos (CSU Extension), videos done by another agency such as local NRCS, or a local Conservation District.

Check out the CSU Extension YouTube channel - https://www.youtube.com/user/CSUExtension/videos





Colorado Forest Legacy Program

The Colorado State Forest Service is accepting Forest Legacy Program proposals from Colorado landowners. The program authorizes the CSFS or U.S. Forest Service to purchase permanent conservation easements on private forestlands to prevent those lands from being converted to non-forest uses. The application deadline is July 31, 2019, for federal fiscal year 2021 funding, and proposals must be submitted by standard mail.

The purpose of the Colorado Forest Legacy Program is to protect environmentally important private forest areas that are threatened by conversion to non-forest uses. The program provides an opportunity for private landowners to retain ownership and management of their land, while receiving compensation for unrealized development rights. Forestlands that contain important scenic, cultural, recreation and water resources, including fish and wildlife habitat and other ecological values, and that support traditional forest uses, will receive priority. Landowners who elect to participate in the program are required to follow a land management plan approved by the CSFS. Activities consistent with the management plan are permitted, including timber harvesting, grazing and recreation activities.

The Colorado State Forest Stewardship Coordinating Committee will evaluate proposals and recommend to the state forester those proposals that have sufficient merit to forward to the U.S. Forest Service. Forwarded proposals will then compete at a regional and national level for funding.

For additional information or to obtain an application packet, contact Carolyn Aspelin at 970-491-1869 or carolyn.aspelin@colostate.edu.

Applications also are available online at http://csfs.colostate.edu/funding-assistance.

Colorado Small Acreage Services Database

The source for landowners to find contractors, equipment, and services

http://sam.ext.colostate.edu



Need help with weed control?

Have a small pasture seeding project?

Search the site today to find a local contractor!

Contractors—Advertise your services here!

This is a free service brought to you by USDA-NRCS, CSU Extension, and your local conservation district

Follow @Colorado Stewardship on Instagram and Facebook

Upcoming focus -

Organic and Conventional Weed Control Methods





For a list of upcoming events in your area visit CSU Extension Small Acreage

Management website

sam.extension.colostate.edu/

Do you have a question about managing your small acreage?

Contact CSU Extension /NRCS Small Acreage Coordinators:

Jennifer Cook Front Range 720-634-3927 Jennifer.cook@colostate.edu Kara Harders
San Luis and Arkansas Valleys
970-219-9903
kara.harders@colostate.edu





