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The New Colorado Water Plan and What It Means for Colorado Agriculture Producers

By Phil Brink, CEP

One week before Thanksgiving, 2015, the Colorado Water Plan (<https://www.colorado.gov/cowaterplan>) was released by the Colorado Water Conservation Board (CWCB). The water plan was two years in the making and involved stakeholders from around the state as well as citizen input from several thousand residents.

The events leading to the development of the state's first water plan started in 2004, when a Statewide Water Supply Initiative (SWSI) was prepared at the direction of the Colorado Gen-

eral Assembly. The SWSI established basin roundtables—which brought diverse stakeholders together from each basin to discuss water supply issues and develop basin implementation plans which describe how each basin will meet future water needs. In 2005, the Water for the 21st Century Act was passed by the Colorado Legislature, creating an Inter-basin Compact Committee to facilitate conversations between the basin roundtables, and aggregate information for statewide planning purposes.

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Colorado Water Plan continued from page 1

In 2010, an updated SWSI report was released, which estimated Colorado's population could swell to as much as 10 million people by 2050, nearly doubling our current population of 5.3 million. The demand for water driven by the increasing population could result in a municipal and industrial water supply gap of between 310,000 and 560,000 acre-feet.

The 2010 SWSI report was an eye-opener. It indicated that as much as 700,000 irrigated acres could be dried -up statewide by 2050 through the purchase and transfer of water rights from irrigated agriculture to urban areas. The projected reduction in irrigated acreage in the South Platte River Basin was estimated at 30% of agricultural land under production. Such large-scale dry-up of irrigated agriculture would have adverse economic, environmental and food security impacts.

In 2013, the Governor issued an executive order directing the CWCB to develop the Colorado Water Plan to address the projected gap. The plan emphasizes water conservation, increased storage, and alternative agricultural transfer methods (ATMs) as the primary means for closing the projected water gap.

The water plan recognizes the economic, environmental, and cultural value of Colorado's agriculture industry. It promotes alternatives to "buy and dry" water transfers, where cities purchase agricultural water rights and transfer them to supply new housing developments. Instead, the water plan encourages sustainable approaches that enable irrigated land to stay in production while helping supply water for other uses. Rotational fallowing, deficit irrigation, and planting lower con-

sumptive use crops are the main practices being looked at for "creating" consumptive use water that would otherwise have been used by crops. Consumptive use water is water retained by the growing plant plus the amount lost through evapotranspiration.

Rotational fallowing involves fallowing irrigated land for at least one growing season. Deficit irrigation may include reduced irrigation throughout the season or ceasing irrigation part way through the season. Crops like alfalfa, which can offer an early season cutting along with survival during dormant periods, may be well suited for deficit irrigation. Planting lower-consumptive use crops, such as substituting sorghum for corn, is also a way to realize consumptive use savings. The 'saved water' can be leased to municipal, industrial, recreational, environmental or agricultural interests. All alternative ag transfers, or "ag water sharing" agreements must be voluntary, temporary, and compensated. A variety of state laws have been passed over the last decade to ensure that a participating landowner's water right(s) are not negatively impacted as long as the terms of the lease agreement comply with state law.

The state water plan puts forth a goal of 50,000 acre-feet per year to come from alternative ag water transfer mechanisms (ATMs). This objective appears viable; however, while the concept of ATMs is simple, the implementation is likely to be challenging as the myriad details are worked out. Saved consumptive use water must be delivered or credited to the lessor. Delivery to a distant, upstream user requires cooperation from other parties, and it must not injure other water rights, including junior water rights that may, for example, rely on the lessor's irrigation return flows. The quantity must also be accurately measured and verified.

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Irrigation in Route County; 1908. NPS, Journal of Heritage Stewardship, V.3, N.2. 2006.

Colorado Water Plan continued from page 2

It is unlikely that any one method will be universally accepted statewide (SWP, 6-116). Alternative ag water transfers will have to be tailored to conditions specific to each basin and will require collaboration among farmers, land owners, ditch companies, lessees, and state agencies.

A few ATMs already exist. One example is the North Sterling Irrigation Company, which for the last decade has been guaranteeing water for the Xcel power plant near Brush. Xcel pays the irrigation company an annual base fee plus a delivery fee if water is actually needed and delivered. So far, no water has been needed, so the irrigation company has simply received the annual base fee, much of which is passed on to the participating landowners.

Another example is the Catlin Canal project—a ten-year municipal leasing pilot project in the lower Arkansas River Valley which began in 2015. In its first year of operation, the project delivered a total of 409 acre-feet of consumptive use water to three municipal water providers, the city of Fountain, town of Fowler, and the Security Water District. Consumptive use agricultural water was ‘freed up’ through rotational fallowing of approximately 1,000 acres of land on six farms served by the Catlin Canal. The participating farms received an average of \$1,030.94 per fallowed acre.

The Colorado Cattlemen’s Association created the Ag Water Network in September, 2015, with the goal of helping to preserve irrigated agriculture in Colorado. The idea of ag water leasing is to enable agricultural water right holders to diversify revenue from their water rights and keep their land in agricultural production now and in the future. This will enable agriculture to show it is helping to meet growing water needs from the municipal and industrial sectors, while at the same time keeping irrigated farmland intact.

Your Energy

We are excited to announce that CSU Extension has just launched a new website called ‘**Your Energy**’ dedicated to helping Colorado consumers make more informed energy decisions.

Your Energy has unbiased energy information and tools you and your friends/family/colleagues may be interested in.

Check out the site for yourself:
yourenergy.colostate.edu

Videos

With warm weather heading toward a close, you may find yourself wondering if your home is as energy efficient as it could be. How can you test your home for air leaks? How can you assess your insulation levels? CSU Extension offers two videos to help answer these questions. So watch, learn, and then...DO!!!

[Testing for Air Leaks](#)

[Assessing your Insulation Levels](#)



811: Know What's Below. Call Before You Dig

In Colorado, it is state law for contractors, excavators, and homeowners to contact the Utility Notification Center of Colorado (811) before embarking on any excavation or digging project. The law established the One-Call Notification System to ensure underground facilities are properly marked before any below ground work begins. This easy to use system will help you protect yourself, any workers in the area and limit the potential damages to underground utility infrastructure.

The process of utilizing 811 is free and very easy. Click or call 811 at least three business days prior to your digging project. You can now submit your request online (visit colorado811.org and click on the Ticket Express link). Be prepared to tell the operator the pertinent information related to your project (including the project address, actual location where project will occur within that address, and what type of project you will be doing). Remember to take down the information relayed by the 811 operator including your ticket number and all the utilities that will be contacted for locating. Don't forget, you are responsible for contacting the tier two utilities listed on your ticket.

After the utility operators have located their utilities, make sure to closely look at the markings so you understand where things are located and how far you need to stay away from those markings. Remember to hand dig within 18 inches of the utilities. The markings will be color coded and labeled related to the utility they are locating. These markings of underground facilities are considered valid so long as the markings are clearly visible but not for more than thirty (30) calendar days. If you are

unable to complete your project within the 30 day period, you will be required to call in your locate request again.

Utilizing the 811 system for your excavation project is not only Colorado Law, but is a smart way to keep yourself and your neighbors safe and maintain a safe and reliable utility delivery system for everyone. Remember to respect the marks and dig carefully when in proximity to any utilities.

How do I plant grasses in my pasture or rangeland?

1. If you currently have a pasture or rangeland in poor condition, before thinking about replanting. First consider invigorating your land with grazing management and weed control. The average cost for reseeding is \$200-\$400 per acre so it pays to adjust management practices first.
2. Check out the [General Guidelines for Reseeding on Small Acreages in Colorado](#).
3. Contact your local NRCS and CSU Extension office to determine the appropriate seed mixtures and seeding methods for your area and soil type. You can also find seed mixes listed in [Appendix A of the Colorado Forage Guide](#)
4. Find local contractors and seed dealers on the [Small Acreage Services Database](#).



Grow Food-Grade Grain Sorghum

By Jennifer Cook, Small Acreage Management Coordinator, CSU Extension/NRCS

Sorghum is a member of the grass family. It is a drought-tolerant warm season crop popular in Central America, Africa, and Asia. Here in Colorado, sorghum is commonly grown for bird seed and forage or silage. But sorghum also makes a great gluten-free flour. In 2015, we tested food-grade grain sorghum varieties for production in Colorado's diverse climate.

Food-grade sorghum produces a white or cream colored seed that can be used for livestock feed, milled to make a gluten-free flour, malted for gluten-free beer, or popped for eating. Because of Colorado's short growing season, early and early-medium varieties are grown to produce harvestable seeds by first frost. Although yields varied by location, an average of 13 plants produced one pound of cleaned grain. When we milled the grain into flour, it took 2 cups of grain to make 1 pound of flour.

Here are some general guidelines for growing, harvesting, and using food-grade grain sorghum.

Planting

If planting and harvesting by hand, a good sized plot to start with is two-100 foot rows. A quarter acre is the most you would want to do by hand. Space rows 30-40 inches apart. Sorghum can self-pollinate, but can cross-pollinate between varieties.

Plant seed after last average frost in your area (May 15-mid June), wait for 3 days of soil temperatures above 60 degrees. F. Soils must be at this temperature for seeds to germinate. Plant seed 1-1 ½ inches deep. In sandy soils plant deeper, in clay soils plant shallower. Plant 1 seed every 3-4 inches if irrigated, or 1 seed every 5-6 inches for dryland.

Irrigation

Sorghum is drought-tolerant and can be productive as a dryland crop. If irrigation is possible, it can help yields during times of no rain. Plant establishment nearly always improves with 1 inch of water applied at planting.

After emergence, sorghum can tolerate cold, and dry stress until it reaches 7-8 leaf stage (12-15 inches tall, around 25-35 days after emergence). If irrigation is available, apply water during this stage. Another good time to irrigate is during the boot stage (early stage of heading). Sorghum uses the most water during this time.

Maintenance

Cultivate or hoe between rows to keep weeds down during early growth. Once the plant grows taller, it will begin to shade the weeds. After the entire head is flowered, grain will harden and be ready to harvest. Sorghum is susceptible to bird damage during this time. Some of our trial locations got completely eaten by birds. Save the plants by fastening brown paper bags over the seed heads or using bird nets. Cool temperatures may slow grain development. If it remains cool and wet, grains may not develop.

Harvesting

Once seeds harden, the grain is ready to harvest. Harvest when the grain is 13-16% moisture content. Test this by eating a seed, it should be crunchy, not milky and soft.

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Sorghum hanging to dry after harvest.

Sorghum continued from page 5



This sorghum was dried in thick bunches and mold grew as a result. Do not consume if any mold appears.

To harvest, use a sharp knife, sickle bar, or pruners to cut the stalks. Leave about 1 foot of stalk. To dry the grain further (recommended), you can hang them, or spread them over a screen or sheet, in a protected area. Your storage area must be dry and free of rodents.

Uses of Unthreshed Grain

Fodder – Once the grain is below 25% moisture, it can be used for livestock feed. Chickens, pigs, cattle, and goats will eat the unthreshed grain.

Livestock can also graze the stubble after sorghum grain is cut from the field. Consider nitrate levels of forage prior to grazing. Read about nitrate poisoning at <http://extension.colostate.edu/topic-areas/agriculture/nitrate-poisoning-1-610/>

Uses of Threshed Grain

Threshing - For a clean grain, the seeds must be threshed and winnowed. You can do this with a thresher machine, or by hand. A simple way is to rub a seed head between your hands over a bucket to release the seeds. Then use a box fan for winnowing (to clean the seed of chaff). Watch some videos and be creative if threshing by hand. Small-scale grain threshers can be built or purchased.

Flour – To make flour, be sure the moisture content is at 12% or less. Mill the threshed grain with a flour mill. Mill it just before use or store it in the freezer

for a few months.

Popped Grain – Sorghum can be popped like popcorn. Be sure moisture content is 12% or less.

Beer – Malt the threshed grain and follow a gluten-free recipe.

Selling flour or grain in Colorado

According to cofarmtomarket.com, you can sell the sorghum flour and grains you produce. The only concern is **mycotoxigenic molds** produced from improper storage. So be sure you harvest the grain at the correct moisture content, and store it properly. If you are selling wrapped grain at a farmers market, or direct to customers, you are exempt from licensing. The grain and flour must be wrapped and labeled. If you are not selling to the end consumer, visit cofarmtomarket.com for licensing information.

Varieties

Three plots in the Front Range and one plot in southwestern Colorado produced data for the 2015 trial. The following varieties performed the best in all locations. Interestingly, the varieties that performed the best were untreated seeds.

SP3303 – early maturity

Chromatin- Sorghum Partners, 312-295-5400

NUS310 – medium maturity

Richardson Seeds, Inc., 806-267-2528

Resources

Colorado Farm to Market. <http://cofarmtomarket.com/>

High Plains Production Handbook. United Sorghum Checkoff Program. Retrieved from www.sorghumcheckoff.com/newsroom/2016/03/28/high-plains-production-guide/

Logsdon, Gene. (2009). *Small-Scale Grain Raising* (2nd ed.) Vermont: Chelsea Green Publishing.

Are My Hens Still Laying?

Curtis Utley, Jefferson County Extension Agent

So you have a few chickens and you are interested to know who is laying and who is ready for the stew pot. How do you decide? There are a few different ways to determine a hen's productivity and more importantly if she is in production. The simplest way to determine who is in production is by watching who goes into an empty nesting box and leaves an egg behind after vacating. No brainer right? Well, who has time to sit and watch hens all day long – I don't.



The vent of a productive hen.

inspect their vents which should be big loose and moist if in production and small dry and tight if not in production. Blow the downy feathers away with a whistle to inspect the condition of the vent.

You can also tell if the hen is in production by feeling her abdomen with your flattened hand while you are holding her. The abdomen should feel soft deep and flexible. If the abdomen is shallow, hollow, and taut the hen is not in production. If the abdomen is taut



**Left—Bleached out corner of beak of productive hen
Right—Yellow pigment visible at corner of beak of unproductive hen**

The next way to determine productivity is to pick up individual hens and inspect



Left—Bleached out shank of productive hen. Right- Yellow pigment visible in the shank of a unproductive hen.

and hard your hen is too fat to maintain efficient productivity.

If you are raising a yellow-skinned breed you can determine how many eggs your hen has laid in a given year by inspecting various parts of the body for pigment loss. The yellow pigment (Carotene) is redistributed from the skin to the egg yolks of productive hens, making the skin white. This occurs in a very specific order. The first yellow pigment lost is from around the vent; the last yellow pigment lost is from the hock joints and the tops of the toes. Yellow pigment is regained during the molting cycle, so the most productive hens (those hens that also molt quickly) may not

completely regain their pigment in all body parts. So during molting, your most productive laying hens will remain white in the feet and beak, and even keep producing eggs.

The order in which yellow pigment is lost from laying hens.

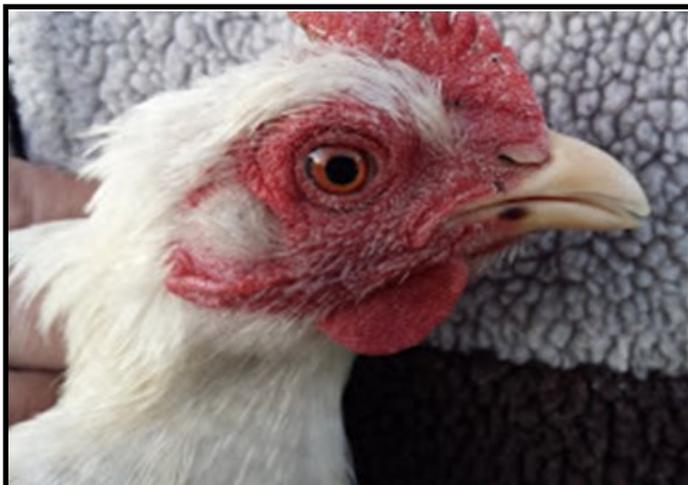
1. Vent
2. Eye ring
3. Ear lobe
4. Beak, from the corner of the mouth to the tip
5. Bottom of the foot
6. Shanks, from front, then back and sides
7. Hocks and tops of toes

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Pigmented (yellowed) Body Area	Egg Production	Weeks of Production
Vent	0-10	0-2 Weeks
Eye Ring	8-12	2-2.5 Weeks
Ear lobe	10-15	2.5-3 Weeks
Beak	35	5-8 Weeks
Bottom of Feet	68	10-15 Weeks
Entire Shank	159	20-26 Weeks
Hocks and top of toes	175-180	30 Weeks +

Estimate how many weeks a hen has been in production based on the yellow pigmented body areas.

Lastly it may seem strange but your most productive hens are going to look ratty and pale, bright and active. The hens with perfect feathers and stunning colors are just pretty and not your true working girls.



This productive hen has a bright, alert, round eye.

Irrigation Options: Side Roll Sprinklers

By John Miller, Delta Conservation District

In 1989 when Paul Schmucker bought his place on Barrow Mesa near Hotchkiss, it had an existing network of dirt ditches to irrigate with. He recalls that his land had to be irrigated from “forty five different directions. We couldn’t get it wet.” In 1990 he purchased his first side roll sprinkler and installed it in one of his fields on his 100 acre Barrow Mesa property. The side roll sprinkler was a quarter mile long used system that he took apart and moved from the San Luis Valley to his property in Delta County. Government irrigation project funds do not pay for used equipment, and Paul is proud of the fact that he installed the entire system infrastructure and rehabbed all of his older sprinklers on his own. After that first one, he says “as we could afford them, we kept adding sprinklers.” He now has seven side rolls on his Barrow Mesa ranch and one on his 20 acre home place on Rogers Mesa; all of which are gravity fed so no pumping is required for pressure.

Side roll sprinkler systems are often referred to by other names including: wheelmove, wheel-line, lateral move, or lateral-roll irrigation machines. All side roll systems are basically an aluminum pipe with equally spaced sprinklers elevated by large metal wheels. Each machine has a gas powered motor in the middle to power and drive the system when it needs to be moved. The whole machine is connected to a pressurized supply pipeline via a riser with a flexible hose. These sprinklers work best for square or rectangular fields, but pieces can be added or dropped to adapt them to irregularly shaped fields. Their low height from the ground makes them impractical for taller crops like corn, but side roll systems work very well for pasture, hay, and alfalfa. When operated properly, side rolls will apply water with an efficiency of +/- 70%. Water distribution with a side roll is much more uniform than with gated pipe and furrow irrigation.

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Side roll sprinklers continued from page 8

Paul has his side rolls on 24 hour sets, which means each one of them has to be moved once a day. To move them he first has to open the flush on the far end to remove any silt buildup, then he turns off the water supply so the automatic drains open up to allow all the water to escape from the sprinkler to make it light enough to roll. Once the motor is running he advances the sprinkler sixty feet, a distance he determines by counting the number of rotations on the large wheels. "Sixty feet is three rotations on a 6'4" diameter wheel." When asked if it is worth all this effort he says "It's a lot of work, but these sprinklers have probably doubled the amount of hay produced on this piece of ground." This increase in production has allowed Paul to increase his cattle numbers without buying supplemental hay, which at the end of the day helps his bottom line.



Side roll sprinkler irrigation.

Photo from http://aspenranchrealestate.com/Irrigation_For_Growing_Hay

Paul is one of many people using side rolls in Delta County to make his irrigation water go farther. Bryan Klaseen is also an old hand at moving side rolls. He started running newly installed side rolls at his home place on Redlands Mesa in the spring of 2013. He says "water distribution is so much more even (than flood irrigation)."

On the fields around his house, Bryan was using 2.5cfs to 3cfs of water to get things wet with flood irrigation. He says that every time he irrigated with the old system his house would try to float away. After upgrading to the new side rolls, he now uses just over 1cfs to water the same area more uniformly without the flooding problems. This has allowed him to put that extra water to better use on other fields.

Bryan runs 12 hour sets for germination, but after he gets plants established he switches to moving the sprinklers every 24 hours. He manages one system where the side roll is 1800' long, and says the most time consuming part is to drain a system that length. Once drained, he can move one of the machines in about fifteen minutes. When asked about drawbacks to side rolls, he says he has to fence the system off when cattle are in the field to keep them from causing expensive repairs to his irrigation system. Another concern he has to watch out for is "the wind will pile them up in a draw." So they have to be properly braced to keep them from blowing away. When asked about the complexity of the moving parts, he says "the mover is no different than your lawnmower motor. There isn't much to it. There is upkeep to them." But he feels that being able to stretch out his limited water supply definitely justifies the extra work.

Your local NRCS (Natural Resource Conservation Service) can provide you with resources and assistance to upgrade your irrigation system. Some system upgrades may qualify for financial assistance.

Colorado AgrAbility

Promoting independence in agriculture for people with functional limitations and their families

JOIN US AT THESE COLORADO WORKSHOPS

About

Join fellow Colorado farmers, ranchers, veterans, their families, and professionals who work with them at these upcoming workshops across the state. These educational events are for Colorado farm families & individuals who are dealing with barriers created by illnesses, or other limitations.

Workshops are from 10:00 a.m. to 2:00 p.m. with a free box lunch provided for those who pre-register one week in advance.

- **Buena Vista:** October 27, 2016, Sangre De Cristo Electric Association 29780 North Highway 24 Buena Vista, CO, Kurt Jones 719-539-6151
- **Trinidad:** November 15, 2016, Pioneer Rm Sullivan Student Ctr @ Trinidad State Junior College 600 Prospect St. Trinidad, CO 81082, Dean Oatman, 719-846-6881
- **Pueblo:** November 16, 2016, County Extension Office, 701 Court St. Pueblo, CO 81003 Tom Laca, 719-583- 6566
- **Walden:** November 29, 2016, Wattenberg Ctr. 686 CR 42 Walden, CO Debbie Alpe 970-723-4298
- **Delta:** January 18, 2017, County Courthouse 501 Palmer St. Delta, CO 81416 Room 234 Doug Dean 970-244-1834
- **Aurora:** February 8, 2017, Arapahoe County Fairgrounds Room 1, 25690 E. Quincy Ave., Aurora, CO 80016 Johnathan Vrabac 719-661-2286
- **Yuma:** February 14, 2017, Concession Building Yuma County Fairground, 410 Hoag Ave Yuma CO, Dennis Kaan 970-345-2287, 970-520-1826
- **Sterling:** February 15, 2017, County Extension office, 508 S. 10th Ave., Sterling, CO 80751 Dennis Kaan (Voice: 970.345.2287, Mobile: 970.520.1826)

Topics

- AgrAbility
- Mental Wellness in Rural Colorado
- How to work well with agricultural lenders and bankers

Agenda

Introduction

- What is AgrAbility?
- Mental Wellness and why it is important
- How to work with Agricultural lenders to get what you need

The Presenters:

Dr. Norman L. "Norm" Dalsted, Ph.D. is an Extension Economist in Farm and Ranch Management and Professor with Colorado State University Extension. He will present current information on how to work well with agricultural lenders and bankers.

Candiss Leathers, CVRT, M.A., is the Rural Rehabilitation Specialist and Manager for Colorado AgrAbility at Goodwill Industries Denver. Her upbringing, education, and experience provide her with the essential tools to assist men and women actively engaged in the agricultural field with assessments and technical guidance.

Dr. James Craig, MA, JD, Ed.D., is a Rural Rehabilitation Specialist with the Colorado AgrAbility Project at Goodwill Industries Denver.

Candy and Jim will present information on stress issues in rural Colorado that impact mental wellness and resources to cope with stress.

Interested in signing up?

To register or to learn more about these workshops, please contact :

Candiss Leathers

720.539.4435 • cleathers@goodwilldenver.org

Norm Dalsted

970.222.5657 • norman.dalsted@colostate.edu

Or the extension agent listed at each location



Colorado Small Acreage Services Database

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

[http://
sam.ext.colostate.edu](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!



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

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

Management website

www.ext.colostate.edu/sam/

Do you have a question about managing your small acreage?

Contact CSU Extension /NRCS Small Acreage Coordinators:

Jennifer Cook
Front Range Coordinator
720-634-3927
jennifer.cook@colostate.edu

John Rizza
Western Slope Coordinator
970-243-5068 ext. 128
john.rizza@colostate.edu



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