

NEW FACES

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I recently accepted the Agriculture and Business Management Economist position with Colorado State University Extension for the Western Region (i.e. western slope). I am excited to be a part of the community in western Colorado and more importantly part of the agricultural community. Even though I have only been here since the first of September I have been impressed by how friendly and open the community is.

I received a bachelors in Animal Science and a minor in Ag Business from Utah State University in 2007, and I recently finished a graduate degree in Applied Economics at Utah State University.

My background is primarily in the beef industry, more specifically cow-calf production. I have been employed by several large cow-calf operations who also raise their own replacement heifers as well as growing steers on pasture. I also have some experience in forage production from grass and alfalfa hay to corn silage. Furthermore, I have experience growing cattle in a feedlot setting. The experience that I have acquired has been from multiple operations on a variety of resources. These range from the sand hills of Nebraska to eastern Wyoming, both eastern and western Montana, as well as Utah. Most of these operations were progressive in how they managed their grass and cattle.

I feel privileged to have worked on a variety of different operations as well as having had all of the adventures of ranching in the various areas of the west. In western Montana running yearling, just west of Yellowstone National Park, was challenging when considering all of the

predation issues. The years I spent in the Nebraska sand hills was educational when bearing in mind the resource base available there when compared to those here on the Western Slope and in Utah. Eastern Montana offered little elevation change however the terrain was very rugged. The Miles City area as well as the Kaycee, Wyoming area are both very rich with the fascinating history of the cattle and sheep industries. Furthermore, I have learned through my travels that there are good people and beautiful places everywhere.

Even though my background is primarily in cattle I have a sincere interest in all agriculture and have a desire to see all operations remain or become sustainable. My expertise at this point is primarily livestock management, and forage and grazing economics, as well as production economics (enterprise budgeting), and farm and ranch management. As I gain experience in these areas and others I hope to see this list expand and change. On a more personal note I enjoy spending time with my wife and two boys outdoors, hunting, fishing, hiking, and woodworking.

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Western PhytoWorks is a publication of the CSU Western Colorado Research Center, 3168 B 1/2 Road, Grand Junction, CO 81503-9621.
 Editor: Calvin Pearson, PhD.
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Unique Pests in NW Colorado Wheat

Bob Hammon, Tri River Area Extension

Moffat and Routt Counties have some of the more remote wheat fields in western Colorado. There isn't as much acreage in small grains as there used to be, but it is an important contributor to the area's economy. Northwestern Colorado wheat fields are home to some insects not found in other wheat production areas. The combination of spring and winter wheat growing surrounded by large acreage of rangelands creates an environment that allows native insects to move from grasses into cultivated wheat fields.

Western grass stem sawfly, also known as wheat stem sawfly, is a significant pest of wheat in the northern Great Plains and it has recently been found attacking wheat in northeastern Colorado. The larva of this small wasp bores within wheat stems, weakening them, causing lodging, harvest problems and yield loss. Insect



Figure 1. Wheat stem sawfly adults (left) are about 3/8" long, bluish-black body with yellow stripes and yellow legs. Larvae (right) are caterpillar-like, creamy white with brown head, and feed within grass or wheat stems. Mature larvae are about 3/4"

surveys conducted in northwestern Colorado wheat fields during the late 1980's and 1990's turned up adult sawflies in wheat, and larvae boring in roadside and rangeland grasses, but no larvae in wheat stems. Surveys done in the summer of 2014 showed no change. Grass stem sawfly has made the transition from grasses to wheat in MT, ND, WY and northeastern CO. Moffat and Routt County wheat growers need to keep an educated eye out for a change in this insect's feeding preferences to stay a step ahead of it in their crop management.. We can't afford to lose any more crop acreage in northwestern Colorado.

[CSU Extension Fact Sheet 5.612 Wheat Stem Sawfly: A New Pest of Colorado Wheat](#) gives an excellent overview of its biology and control.

There is a flea beetle that has been present in Moffat and Routt County wheat for decades. Growers are aware of its presence, but have never been overly concerned with it because yields were typically in the traditionally acceptable range. Information on flea beetles in wheat is almost non-existent. There has been very limited research done on this flea beetle, *Chaetonomia subconvexa*, which was only described in the 1980's. Life histories of closely related flea beetles suggested that the larvae would be underground root feeders. However, a sample submitted to CSU this past summer found larvae feeding on and killing developing secondary tillers within the plant. The impact of this type of damage is unknown, as wheat plants may compensate for lost secondary growth by putting extra growth resources into surviving stems. Further research is needed to tell whether this unknown insect is costing northwestern Colorado wheat growers money, and if there are acceptable management options.

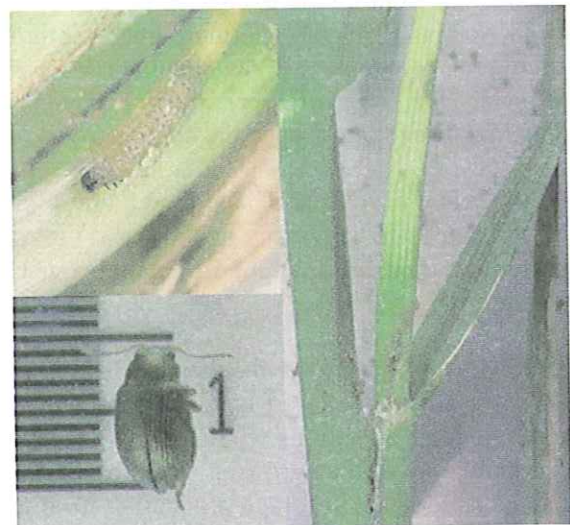


Figure 2. The adult wheat flea beetle is only about 1 mm long (bottom left). It is shiny black in color. Larvae can be found feeding inside newly formed tillers, which they kill (top left, right)

For more information about this article contact Bob Hammon at Tri River Area Extension 970-244-1834, Bob.hammon@mesacounty.us.

New Faces—Continued from Page 1**Jordana (Jordge) Lafantasic**

I was raised and spent the early part of my adult life on the Front Range of Colorado, but, when I figured out what I wanted to do with my life, I moved to Wyoming. I earned my degrees in Agronomy/Rangeland Ecology/Plant and Soil Science from the University of Wyoming and until recently, I taught Rangeland Science and Biology at Fort Hays State University in Hays, KS.

Last year (May, 2013), my spouse began work at CMU in Grand Junction, and I resigned from my professorship and relocated in May 2014. While I hope to eventually find permanent full-time employment in the Valley, I am currently teaching biology courses and developing educational materials online part-time. My part-time work allows me plenty of time to volunteer for the Mesa County Library and the Western Colorado Agricultural Experiment Station-Orchard Mesa. I joined the Station as a volunteer very recently after an exciting discussion of possibilities with the Station manager, Greg Litus.

At this time I am working on a small portion of a much larger USDA project called the BANR project. Together with Greg, I am redeveloping a proposal to investigate the influence of biochar additions to peach orchard soils. We hope to obtain additional funding to monitor a variety of parameters including soil moisture, fertility and greenhouse gas production in addition to above and belowground growth and production of peach trees. While my research interests have previously focused on soil/plant interactions in the face of disturbance (natural or human) in rangelands, I have enjoyed learning more about orchard management and dynamics.

I am excited to be living on the Western Slope and am looking forward to learning more about its unique natural and agro-ecosystems and working with their stewards.

For information about BANR contact Greg Litus at greg.litus@colostate.edu.

**No Chico Brush Continued from Page 6**

The Nature Conservancy, and others started this initiative to create and implement innovative water management strategies.

Dr. Perry Cabot is collaborating with the initiative to establish applied and integrated research sites in Montrose County. These sites utilize the water-budgeting concept on fields to compare traditional flood-furrow irrigation against center-pivot sprinkler and sub-surface drip irrigation. Obviously, research comparisons of this sort are widely summarized in academic, instructional and Extension literature. The NCB Group felt strongly that local farmers and producers, like all businessmen and women, would more seriously examine these tools if they could view and engage with field tests performed in their own region.

In 2014, the project initiated 3 sites in Montrose County. One of the completed comparisons thus far portends promising results for farmers using sub-surface drip irrigation for their onions. The side-by-side comparison was performed on a sandy-clay-loam soil, with metered irrigation rates of 32.1 and 19.6 in/ac for the furrow- and drip-irrigated fields, respectively. The fields also benefited from 5.0 in of rainfall during the cropping season. Despite the lower water application, reported yields were significantly higher for the onion field. After a 15-day dryout period, yields were 55,369 and 65,615 lb/acre, again for the furrow- and drip-irrigated fields, respectively. The drip-irrigated also yielded approximately 2 ½ the number of colossals, a similar number of jumbos, and approximately 40% more medium-sized onions. Additional comparisons are being done with field-corn (5654 Dekalb) for center-pivot sprinkler versus flood-furrow.

The tests will be expanded in the next several years, with funding acquired from the Colorado Water Conservation Board and matching partners, totaling \$265,000. Additional sites will include comparisons for alfalfa, grass hay, sweet corn, and perhaps cover crops. Aside from the comparison of mechanical technology for adjusting irrigation, the project will embark on a comparison of sensor-triggered irrigation water management (IWM) regime, under which scheduled irrigations will occur based on feedback from soil moisture sensors within an array of telemetrically communicated data, supplied by the Irrrometer® Company of California. For more information on this article contact perry.cabot@colostate.edu.

The Purpose and Value of Agricultural Burning

Dr. Calvin Pearson, WCRC-Fruita
Bob Hammon, Tri-River Extension

Agricultural burning has been and continues to be a topic of interest to the general public. No doubt agricultural burning has various downsides that cause environmental and health issues along with aesthetic concerns that may be considered to be a public nuisance to some people. Dense smoke from agricultural burning can impair visibility and can contribute to dangerous driving conditions. Certainly, agricultural burning is not the only source of smoke that can degrade air quality. Wildfires, prescribed burns on public lands, fireplaces, and other open burning can also affect air quality at various times of the year. These sources of smoke require specific management approaches. The downsides to agricultural burning are recognized and noted. The purpose of this article is to inform the reader from the perspective of the agricultural community about the purpose and value of agricultural burning.



An agricultural burn being performed at the Western Colorado Research Center at Fruita after corn grain harvest to reduce the amount of crop residue to a more manageable level.

Agricultural burning has been ongoing for thousands of years. Burning is considered by producers to be an essential tool because it removes crop residue, makes seeding and other field operations easier, helps promote economically viable crop yields, stimulates early spring growth of some perennial crops by warming the soil, and reduces the use of chemicals by combating plant diseases, harmful insects, and weeds. Agricultural burning can also be helpful for making surface irrigations, such as in furrows, easier to perform. Open burning is also useful to improve water flow in canals, laterals, delivery ditches, and drainage ditches.

Agricultural Burning—Continued

Furthermore, periodic burning of fence lines, along farm roads, and other areas around the farm establishes defensible space and has other value for vegetation management. Increased aesthetic value is possible from agricultural burning by reducing or eliminating weeds and other undesirable plant residue along with prompting the growth of desired vegetation.

Burning can also reduce the number and intensity of tillage and seedbed preparation operations, which may make the soil less susceptible to erosion, promote good water quality, and reduce windblown dust problems. As shown in the photographs in this article taken at the research center, this cropping system eliminates several tillage operations including disking, plowing, roller harrowing, and land planing, which will reduce costs by more than \$70/acre. Cost savings for field operations were estimated based on 2013 custom rates for Colorado farms and ranches. These custom rates are available on the Internet at <http://www.coopext.colostate.edu/ABM/>. Keep in mind that reducing the operating tractor time in the field saves fuel and reduces exhaust emissions.



Strip tilling in fall 2014 at the Western Colorado Research Center at Fruita in a furrow-irrigated corn field that was burned to reduce residue to a manageable level. This approach reduced the number of field operations needed to prepare a high quality seedbed for planting in spring 2015.

On the other hand, agricultural burning can cause detrimental effects including removing crop residue that can increase soil organic matter and soil fertility, destroy crop residue and vegetation that may filter water and improve soil-water holding capacity, and damage or destroy desired living vegetation, among others.

Agricultural Burning—Continued

In Mesa County, during the spring and fall of each year, permits are required for residential open burning for dry weeds, garden waste, and tree, shrub, and brush trimmings that are less than 1-inch in diameter. Fees are associated with obtaining residential burning permits. Active “for profit” farmers and ranchers are exempt from the requirement to obtain an open burning permit in the State of Colorado. The exemption applies to farmers and ranchers who are producing “for profit” agricultural products that originate from the land. Additional details regarding open burning in Mesa County can be obtained at:

<http://health.mesacounty.us/environment/air/template.aspx?id=2624>.

For more information about this article contact Dr. Calvin Pearson at calvin.pearson@colostate.edu or Bob Hammon at bob.hammon@mesacounty.us.

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Sage Grouse Diet

However, just because we find certain insects in the environment, we don’t know if sage-grouse actually eat them. One of our participants found a dead sage-grouse, and after obtaining permission from Colorado Parks and Wildlife, we dissected the crop and gizzard under a microscope in the lab. The gizzard was filled with several hundred ant heads (see photo below), other insect parts and vegetation. Though we cannot conclude much from one gizzard, (for example, did this *particular* bird prefer insects? Did the bird opportunistically come upon an anthill before death? Did the bird typically eat this many ants?), ants were much more common in the crop than any of our samples.

While many questions remain, some answerable, some not, insect sampling in 2015 may help us understand more about the kinds of insects present on plots in Eastern Moffat County, if and how these insects change over the course of a summer, and if we see different insects in areas with a mechanical treatment applied to the sagebrush versus non-treated areas.

Thank you!!!

Bob Hammon, Elizabeth Neubauer and Melissa Franklin, CSU Extension and Western Colorado Research Center, and participating ranchers.

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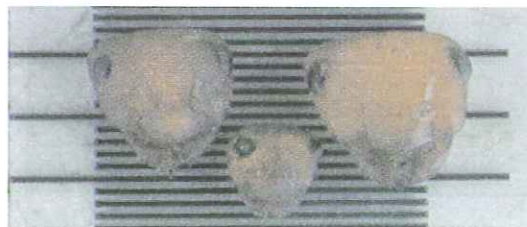
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Tiny ant heads from a sage-grouse gizzard.
Large lines represent 1 mm.

Blunt Ear Syndrome Alert
 Dr. Calvin Pearson, WCRC-Fruita

A physiological condition was observed in corn in western Colorado in 1989 in which the ear length of corn was shortened and the tip of the ear did not produce kernels. This disorder of corn was subsequently termed Blunt Ear Syndrome (BES). Grain yield loss attributed to BES in one field in 1989 in the Grand Valley was estimated to be greater than 75%. Long-time farmers in the Grand Valley indicated that BES had occurred to some extent over the years but not as severe as that experienced in 1989.

Here at the Western Colorado Research Center at Fruita we had one corn hybrid this year (2014) that exhibited significant BES (see accompanying photo) resulting in considerable yield loss. It has been several years since I have had reports of BES in western Colorado. Given the BES we experienced this year with a particular corn hybrid I wanted to alert growers that it is still possible to experience significant yield losses due to BES.



Over the years, I have had reports of BES in most corn-growing regions of the country and in several countries of North and South America. BES occurs broadly and is not just a western Colorado problem. Nevertheless, BES occurs sporadically across regions, years, and fields.

BES can be identified by two main visual symptoms. The ear length is much shorter than a normal ear given a comparison of ear to husk length. Also, the tip section of the ear does not fully develop and does not produce kernels. The tip of the ear is often broadly rounded and often has a bone-like projection at the apex. Husk formation appears normal. Under field conditions, corn often appears normal- that is, normal ear growth and grain production occurs around the 10 to 20-foot perimeter of the field while the interior of the field exhibits BES.

Crop management practices may help to minimize blunt ear syndrome. Delaying corn planting until after the first

Blunt Ear—Continued

week of May in our area has been implicated to provide some reduction in BES. We do know that corn hybrids differ in susceptibility to BES. Corn hybrids selected for planting should be based on a local production history of resistance to BES over several years.

Management practices that minimize stresses may also reduce the incidence of BES. Applying optimum amounts of fertilizer based on soil-test recommendations, and proper irrigations- avoiding over and under irrigating. Growers should also minimize weed and other pest competition in corn. Nevertheless, good crop management is not a guarantee that BES will be prevented, but good crop management may minimize the severity of BES.

In reality we do not know a lot about BES and how to prevent it. Furthermore, it is a difficult problem in which to conduct rigorous scientific research because it cannot be readily attributed to one or two causal agents. The report we published years ago detailing BES (called corn-ear stunting at that time) is in Pearson and Golus (1990). The most comprehensive research on BES was conducted by Fithian (1999) in which he studied the etiology of BES in corn.

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For more information about this article contact Dr. Calvin Pearson at calvin.pearson@colostate.edu.

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NoChicoBrush Group: A farmer-led initiative to quantify and demonstrate irrigation efficiencies at farm-scale through instrumented water budgeting

Dr. Perry E. Cabot
Colorado Water Institute and CSU Extension

Drawing its name from the described goal of removing *Sarcobatus vermiculatus*, also known as greasewood or “chico brush”, the NoChicoBrush (NCB) Group is a farmer-led initiative working to promote water use efficiency for increased profitability and sustainable farming. The impetus for forming the group was to address the growing demands on water availability and the water quality concerns in the Gunnison and Colorado River Basins. Local farmer leaders along with interested parties including Uncompahgre Valley Water Users Association managers, Colorado River District representatives, Delta Montrose Electric Association, local business leaders, local lending institutions, Montrose and Delta County Commissioners, Trout Unlimited,

Insects and Sage-Grouse Diets in Eastern Moffat County

Retta Bruegger, Research Coordinator
Forest and Rangeland Stewardship

What influences sage-grouse survival? Many factors, including habitat, predators, management practices, and surprisingly, insects. Insects are a critical part of sage-grouse diets during the early part of their lives (Klebenow and Gray 1968; Johnson and Boyce 1990; Drut et al. 1994; Gregg and Crawford 2009; Hess and Beck 2012). In fact, chick mortality is greater than 90% if sage-grouse don't have insects (and the protein they provide) during the first three weeks of life.



Bob Hammon and Elizabeth Neubauer (Research Associate) discuss insects with a participating rancher in the field.

Learning from the Land is a research and outreach project of Colorado State University's Warner College of Natural Resources. Our work promotes adoption and application of state-and-transition models (STMs) for adaptive management of sage-grouse and other wildlife habitat in northwestern Colorado and Wyoming. STMs are diagrams that represent the best available knowledge about how different types of land change over time in response to management, disturbances, and weather. One of our project's goals is to integrate wildlife habitat indicators within STMs so they can be used as tools to evaluate trade-offs, opportunities, and hazards among different types of uses, including grazing and wildlife habitat management.

In order to build these models, our team measures variables related to soils, topography, vegetation, and sage-grouse and songbird habitat, but we did not initially consider insects.

One of our participating ranchers encouraged us to consider looking at insect populations after he learned about their importance to young sage-grouse. Through the help of Bob

Hammon, Area Extension Agent in Agronomy and Entomology for CSU Tri-River Area Extension, and a fellowship from CSU's **Center for Collaborative Conservation**, we added insects to the list of variables monitored on a subset of plots. The insect monitoring will continue in 2015, and will allow us to assess if there are differences in abundance and types of insects when we compare areas of mechanically treated-sagebrush to control areas, and, if and how the kinds of insect species change over the key hatching period for sage grouse in Eastern Moffat county.



A red fly under a microscope. Found in one of our samples.

Our preliminary samples reveal many types of *tiny* insects, but much fewer large insects than you might expect. For example, we've found mites, leafhoppers, aphids, thrips, globular springtails, most of which are smaller than ¼ inch in length. We haven't found many larger insects like ants, grasshoppers, or moths. Though we found upwards of 60 insects per sample so far, which we could extrapolate out to around 700,000 individuals per hectare, (or 400 grams/acre). From the perspective of a sage-grouse, however, the protein return relative to effort might be disappointing because the insects are so small.

The lack of larger insects made me wonder, are these insects not present in the ecosystem (or in low numbers?) or are they present and we just didn't capture them in our sample? Perhaps this is a combination of both environment and sample techniques. Broadly speaking, the abundance of insects depends on moisture conditions: more moisture contributes to more plant residue and litter, which results in larger insect populations. Recent dry conditions in Moffat County might have resulted in lower insect populations. Additionally, we are sampling a small area because of time limitations in terms of sorting and identifying insects.

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Additional funding
from the Colorado
Agricultural Experi-
ment Station



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Rogers Mesa Research Center Update

Greg Litus, WCRC Manager

The ongoing status of the Rogers Mesa Research Station regularly comes up in conversations with people interested in research at the Western Colorado Research Center. Currently Rogers Mesa is not listed for sale. Instead, Robbie Levalley, the Delta County Administrator, is leading the effort to investigate options that will keep Rogers Mesa functioning in some capacity. C.J. Mucklow, the Western

Regional Director of CSU Extension, is assisting Robbie by facilitating a series of ongoing meetings that include the Delta County Commissioners and a number of Delta County citizens involved in economic development education and agriculture. The meetings are convened to help focus ideas that all converge on Rogers Mesa continuing to function as a facility that provides opportunities for agricultural education and local grower support. This may all sound nebulous but I and other representatives from CSU have attended the meetings and we are impressed by the genuine desire in Delta County to see Rogers Mesa become more integrated with other educational and agricultural organizations in the County. At this point in the process, financial commitments by CSU and others are being formalized so that a more detailed feasibility study can be developed. The feasibility study will compare Rogers Mesa with other regional and national community education and research centers, evaluate prospective interest, identify potential funding sources and develop the detailed financial analysis necessary for any proposal to succeed. Until the process is completed, WCRC will continue to manage Rogers Mesa as a functional but idle research station with the understanding that it may open again in the near future.



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2015 Western Colorado Pest Management Workshop

Montrose Pavilion

February 18-19, 2015

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