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DECEMBER 2016

**2016 Golden Plains Area Agricultural Handbook
Orders Are Being Taken Now**

The 2016 edition of the Golden Plains Area Agricultural Handbook is currently in production and orders are being taken now for your copy. This Colorado State University Extension publication is a permanent and often used item in many farm, ranch, and agribusiness offices in Northeastern Colorado. This resource book contains the latest university research for High Plains agriculture in Colorado. Most of the research results presented in the handbook are conducted on local farms and ranches in the area.

Subscribers will find information regarding crop production, water management, crop pathology and weed management information, along with insect control, horticulture, weather, livestock cost of production, and crop cost of production information. In total, subscribers will find approximately 150 pages of current research information required to make informed decisions for agricultural operations.

Pricing for the handbook is a tiered pricing structure for multiple subscriptions and the handbook is available in print copy or CD version. The CD version has the added benefit of spreadsheet templates and other resources useful in farm and ranch decision making processes. The deadline for receiving a break on our subscription price is March 10, 2017. The anticipated delivery date for the handbook is March 31, 2017. Order forms are available at every Golden Plains Area Extension office or from our web site at <http://goldenplains.colostate.edu>. Please send your order to: Washington County Extension Office, 181 Birch, Akron, CO 80720. An online ordering and payment option is also available on the web site.

Don't miss out, hurry and get your order in today!

To receive an e-mail notification of publication on-line for the
Golden Plains Area Agricultural Newsletter call 970-332-4151
or e-mail coopext_yuma@mail.colostate.edu

AGRONOMY

Navigating the Online Energy Information Landscape

Ron F. Meyer, Area Extension Agronomist

Fall weather and cooler temperatures naturally turn thoughts to heating homes and changing energy usage. While analysts predict an increase in natural gas prices, you might wonder: is this the year you should finally insulate the attic? What about LED bulbs—are they the real deal? Your neighbor just installed solar panels—does it make sense for you? Where does our electricity come from anyway?

Colorado State University Extension's new 'Your Energy' website was just launched, with these questions in mind. Another website, you say? What makes 'Your Energy' different is that it brings together unbiased, research-based information from Colorado's land grant university with practical, down-to-earth advice so you don't have to try to sort energy fact from fiction.

"We hope that when one hears the name 'Your Energy', it directly conveys meaning and a sense of empowerment for individuals to make their own energy decisions", says CSU Energy Specialist Cary Weiner. "We want 'Your Energy' to become the go-to resource for Coloradans with energy questions and that we can live up to our slogan; 'Energy questions—answered'."

A prominent feature of the site is CSU Extension's fact sheets, which have been broken into a manageable FAQ format, making the information you need easy to find and relatable. The site also has 10 energy calculators to help you figure out whether new insulation, lighting, solar panels, and other energy investments make sense financially. In addition, the website has videos and other media to show you how to find air leaks, measure your insulation levels, and more.

"We made the switch from the typical CSU Extension-oriented website to 'Your Energy' after careful analysis of consumer need," says Weiner. Your Energy is dedicated to providing practical, research-based information to consumers—pure and simple. "We are proud of the energy programming and other resources offered by Extension, but we didn't want to use the site for self-promotion. It is a dedicated resource for the Colorado consumer—no strings attached." Find this site at: yourenergy.colostate.edu.

Colorado Agricultural Energy Efficiency Program

Ron F. Meyer, Area Extension Agronomist

Colorado farmers can improve energy efficiency in their agricultural operations and save money. The Colorado Agricultural Energy Efficiency Program offers a variety of energy assistance including:

- Free energy audits tailored to your agricultural operations
- Objective, third party technical assistance
- Assistance with grants and rebate programs for energy saving equipment

Energy audits are available on a first-come first-served basis. Call 1-800-441-8525 or email agservices@gdsassociates.com with questions. In addition, visit the website at www.colorado.gov/energyoffice/agricultural-energy-efficiency. Last and new this year, greenhouses are now eligible for participation in addition to powered irrigators and dairies.

Economic and Environmental Potential of High Plains Cover Crops

Ron F. Meyer, Area Extension Agronomist

Sparse or erratic rainfall leaves farmers looking for anything they can do to increase yield while decreasing things that cost money – such as irrigation. High Plains crop producers have a keen interest in both crop rotation and management strategies that influence their economic viability and the future of their agricultural enterprises.

Colorado State University crop and soil scientist Meagan Scipanski is interested in how diversifying crop rotations and using cover crops can maintain yields, keep soils productive, reduce environmental impacts and address retention of both soil carbon and water. She recently secured funding for a collaborative grant for sites in northeastern Colorado, Kansas and Nebraska. Extension personnel on the Golden Plains will be assisting in local areas by providing a solid producer base for onsite research.

“One of the costs to tillage is we release both carbon and water into the atmosphere and that’s unproductive and part of the greenhouse gas complex,” says Ron Meyer, Extension agronomist in the Golden Plains area of eastern Colorado. His collaboration with Schipanski will guide conversations with cooperators who have an interest in hosting this research on their farms of between 20 and 40 acres. Crop scientists at Colby, Kansas, and several sites in Nebraska are also recruiting volunteer cooperators to expand on-farm testing to sites throughout the region.

“Meagan’s interest in cropping systems, cover crops, no-till and integrating livestock into this whole system is just a natural fit for High Plains Agriculture,” says Meyer, who, for the past five years has conducted research comparing nearly 30 different plant species for cover potential and forage production with various production techniques.

Including Livestock in the Mix

The new research project will incorporate Meyer’s original cooperators, but including livestock into the mix means more land is needed.

“On-farm research is an essential component of this study, Schipanski says. “We would like to utilize a wide spectrum of farmers from across the region to help validate our recommendations for new crop rotation practices.”

Beginning in February, the team will bring cooperators together with researchers to discuss timeline and strategies.

“Anytime you get 10 or more farms and farmers together, the dynamics change,” Meyer notes. “Some farms may have no livestock, some farms may be heavily livestock-oriented. We have to have a way to coordinate that so the research and the information coming out of this project make sense.”

Where the research protocol identifies a need for livestock on the site at a certain period of time, for example, the cooperators will agree to bring the livestock in for a set number of days and then take them off. The research team will weigh them in and weigh them out with a focus on a data-rich project.

Cropping Research Long-Standing

Colorado State University research in the Golden Plains Area cropping systems has been in place since the early 1990s, with projects conducted by CSU soil and crop scientist Gary Peterson. His findings moved the farming community to two dryland crops in three years. Farmers now plant wheat, then into that wheat stubble the next year, they plant a spring-seeded crop such as corn, milo, millet or sunflowers, followed by a fallow season. Reduced tillage strategies were a part of this transformation

“Dr. Peterson had to get through a couple of years of research and get results before farmers began to take notice,” Meyer notes. “One of the early results was, dryland corn yields almost 70 bushels an acre some years. Farmers began to ask, ‘Can you make some money with this practice?’ And the answer was, ‘yes, most years you can make some money,’” Meyer said. “Employing reduced-till strategies is better for the environment and increases yields, so it was a win-win situation for everybody.”

Meyer says adoption of these new techniques took a while. “It was probably a whole seven years before producers really started to adopt the conversions and it was the innovators that did those conversions first.”

As neighbors and the community saw the new method working, the whole countryside began to adopt the new practice. “We’ll see what the research results show us with this new project. Maybe there will be another change for production agriculture out here,” Meyer says.

Reprint 2015 Annual Report, Colorado State University

HORTICULTURE

Project Learning Tree and Environmental Education Council Meeting

By Linda Langelo, CSU Horticulture Program Associate

In 2015 at a lunch during our CSU annual forum, I meet Shawna Crocker, Colorado Statewide Project Learning Tree Coordinator (PLT) who is also a member of Northeast Regional Council for disseminating Colorado Environmental Education. We discussed a plan to attend a BOCES meeting in the spring of 2016. We got on their agenda and disseminated information about PLT and the Northeast Regional Council. Initially we thought we were making headway by bringing the information to the Superintendents at the BOCES meeting. The Superintendents had other priorities and the information got pushed to the bottom of the pile.

We regrouped and began gathering a listing of other school leaders such as principals. By the time that list was assembled, school was out. We decided to approach the principals early in the fall when school begins. We did and this time we were successful in gathering teachers from Revere, Julesburg and Haxtun. Shawna Crocker had grant funds to use and we did so by inviting them to a dinner meeting. Twelve teachers attended.

Our mission was to understand what they needed to help them reinforce the state standards that they were teaching in class. We also introduced them to PLT and the chair of the Northeast Regional Council, Alicia Christensen, Outreach Coordinator of the Denver Zoo. From this meeting, we walked away with the understanding that all the teachers want an outdoor aspect to enrich their teaching without further burdening them. We also learned that they want more science, nutrition and wellness something that CSU Family, Consumer Science Agents can provide.

We learned that the principals are striving for community service learning projects. We have some great projects around the community that would contribute to youth developing and shaping their communities. We agreed that our ideas mattered less because we should be asking the students what and how they want to contribute. Something we all forget -- the engagement of others. Understanding how they see their world is vital to how it meets all our needs. We are planning on another meeting to include the celebration of PLT which is its 40-year anniversary. At the same time, providing a workshop on PLT and learn more the initiatives which sustain environmental education program in Colorado. This meeting may take place in December of 2016 or January 2017.

Shawna Crocker, Alicia Christensen and I opened a "door" for these teachers and schools. There are more opportunities for these small communities without burdening the teachers' lesson plans and curriculum. As a bonus, as of this week, there is a flexible block grant program to "give school districts the authority to select from (among other things) a number of student enrichment activities, including environmental education and field-based and service learning activities to support STEM learning." In addition, there is a competitive grant program which supports after school and out of school time learning opportunities, including environmental literacy programs.

The Northeast Regional Council now has the Golden Plains Area on their map. We look forward to developing a deeper impact with all other neighboring communities in the Golden Plains Area to help them meet their classroom educational needs.

Late Blight

By Linda Langelo, CSU Horticulture Program Associate

New late blight resistant varieties are happening quickly these days. There are breeders these days that use molecular methods to screen the DNA for markers that indicate the presence of the resistant genes. Before this process, varieties had to grow the plants out which resulted from each cross. The varieties would need to get to a substantial size before they were treated with an inoculant. The inoculant helped them look for a resistant phenotype.

So here is a little history. We could say it is all in the microscope! Molecular biology started in the 1930's. But Zacharias Janssen invented the microscope around 1590. The microscope plays a significant role in examining the molecular structure of DNA. Without the microscope we would not be able to see photons and protein crystals today.

How do you know with the naked eye if you have late blight on tomatoes? The symptoms can include brown, irregular foliar lesions which can have a pale green margin or halo around them. Look for white sporulation under the leaf in humid weather or conditions. These spores being produced under the leaf can blow for miles on the wind. Sometimes, the stems are like a chocolate brown. The fruits will remain firm with dark lesions on them.

For large tomato producers in the U.S. there have not been any major outbreaks of late blight. In Europe there have been outbreaks according to Country Folks Grower West Magazine. The concern with these outbreaks is the population of the pathogen might shift. Why? A late blight causes another separate type of oospores to mate with the first set of oospores from the early blight. This is where DNA recombination comes up with a type that can do well overwintering in the soil and start new infections in the spring crop.

This is where the practice of vigilance with Integrated Pest Management (IPM) is important. With regular inspections of crops, you can have early detection. Apply this with a good understanding of what diseases are more susceptible in varying environmental conditions and you become an excellent IMP scout.

One key to stopping the spread of late blight according to Dr. Beth Gugino, a Penn State Plant Pathologist is to eliminate cull/waste piles of tomatoes. Use certified seed and discard any seed that does not look healthy. Pull any solanaceous or weeds in the nightshade family while scouting the tomato crop. Some solanaceous weeds are as follows: Nightshade, Buffalo bur, Henbane, Wolfberry, Jimson weed, Peruvian groundcherry and Velvet five eyes.

As with human illnesses, there seems to be more and more resistant strains of blight that are resistant to fungicides. The strains become aggressive. Other crops in the Solanaceae Family include potatoes and peppers. They all share a susceptibility to this fungus. Crop rotation is important. Cleanliness at the end of the season is helpful. Other tips for management according to Manitoba Agriculture include:

- Increase spacing of plants to reduce canopy density
- Carefully manage irrigation to avoid increasing disease risk through prolonged periods of wetness.

Applying all of the options for management in this article can be helpful to your success in raising a good blight free tomato crop. If you need a diagnosis, feel free to consult with an Extension Agent at your local Extension Service Office.



Squash Bees

By Linda Langelo, CSU Horticulture Program Associate

What are squash bees? According to the USDA, they are native solitary bees of two genera, *Peponapis* and *Xenoglossa*, the so-called "squash bees". Go out into your garden during the first few hours after sunrise. Take a close look at the bees flying between the flowers. They would be male squash bees searching for a mate. After their morning search, they will be napping at noon in the withered flowers.

The researchers of the Southwest Michigan State Research and Extension Center conducted a pollinator study using strips of flowers between rows of cucumber crops. The flowers chosen were yellow mustard, buckwheat and sweet alyssum. They wanted flowers which were blooming before and during the flowering of cucumber vines with sources of nectar and pollen. They also wanted flowers which would not be aggressively invasive or needing special cultural care.

The outcome they wanted was to have the bees attracted to the flower strips between the rows of cucumbers. They wanted to compare the numbers of honeybees to wild bees. The end result was the bees that came to the flowers stayed in the flower strips rather than moving out to pollinate the cucumbers. The bees were more interested in the

nectar provided by the buckwheat and yellow mustard. The bees fed off these rather than moving onto the cucumbers.

What they found was squash bees came to pollinate the cucumbers. Squash bees cover an area from northern Mexico to throughout most of the Continental US. Once the cucumbers are planted the squash bees move in and don't travel very far. There is one generation per season. This is enough to create their 4-to-5-celled underground nests for pupae. They will be ready for next season.

The researchers concluded that non-crop strips of flowers were not the best option. They also decided that recommending how to encourage more numbers of squash bees on a long-term basis was the best solution. That would mean providing a meadow or hedgerows to have nesting sites close to the cucumber crops.

Sometimes our research yields more confirmation about the natural cycle of our planet. Another conclusion they determined was with our "wall to wall" corn and soybeans there is no opportunity for a wildflower planting or nesting sites for bees.

The CSU State Forest Service does offer a short list of native plants on the tree seedling sales list. This was started two years ago. They are sold in lots of 30 plants which may be subdivided into multiples of 5. Sedgwick County Extension Office does offer tree seedling sales in the Golden Plains Area. Consider adding these to your hedgerows and windbreaks in the coming season. Keep in mind it takes 4 to 5 years before we see an increase in wild bee numbers after establishing more native plants. Contact Linda Langelo at the Sedgwick County Extension Office by calling (970)474-3479 to receive an order form or to review the available plant choices.

More Freeze Damage

By Linda Langelo, CSU Horticulture Program Associate

Just the other day we had temperatures in the 70s and 80s. One day of 80 degrees Fahrenheit follows one day of 30 degrees Fahrenheit with overnight temperatures in the 20s. Not exactly the same scenario that we saw in November 2014 with a 60 degree Fahrenheit change because the leaves have fallen and the plants had a longer time to transition following an earlier frost.

How will different plants sustain this shift from fall into winter? If you planted any new plants, particularly non-natives they may not fair as well. If they are natives, such as chokeberry or serviceberry, they may show no signs of damage. Any of the established native plants are physiologically adjusted to these climatic swings. Anything newly planted native or non-native as a general rule, will struggle with these climatic swings.

Lawns should come through this recent shift well. If the weather stays dry and hot again for winter conditions, then the turf will sustain damage. If the winter is a dry and warmer one, be looking for mites in the turf. Please refer to the following fact sheet: *Clover and Other Mites of Turfgrass – 5.505* for information.

Ornamental trees such as crabapple or hawthorn may have some flower bud damage. You will have to wait until spring to see how much damage. Other types of flowering plants such as shrubs may also have sustained damage. Some of these would be forsythia and flowering quince. However, lilac and viburnum are cold hardy and would sustain less damage.

So let's hope for minimal winter damage and prolific flowering in spring.

RANGELAND

Authors note: The following is part 1 & 2 of a 3 part series on Eastern Colorado's rangelands. Part I will cover pre-history to Spanish contact. Part II will cover the Spanish/French/Mexican periods. Part III will cover the American period and development of the cattle industry. Each of these periods shows us a different way of understanding the land, as well as its human dimensions.

What Can the Past Tell Us About Range Management?

Part I: Pleistocene to Pre-Contact

Don Schoderbek is a Regional Specialist Range Management

I was recently meeting with a group of stockmen at their county business meeting and we were discussing the merits of various grazing systems. A punchy old rancher spoke up. He said, "Sounds like you just want us to run our cows like bison. That's what the plants evolved for... right?" While succinct, this is a very good explanation. Grasses are physically designed to be grazed multiple times throughout the year. This is important because the plant community of Eastern Colorado evolved in the presence of grazing animals, primarily bison.

Following the Ice Age, bison were an evolutionary oddity. Large, strange animals such as giant camels, giant sloths, mammoths, dire wolves, saber-toothed tigers, short-faced bears, and American lion dominated life on the Great Plains. These animals, called Pleistocene megafauna, were mostly extinct by 10000 BCE. The ancestors of bison were also much bigger than current species. Modern bison are a dwarf species with a high reproductive ability and low nutrient requirements, filling several niches of extinct megafauna. Bison were rapidly being left alone at the top of the evolutionary heap by a changing climate and the introduction of a cunning, vicious new predator – humans.

The bison population was also somewhat unstable. Two major periods of absence in the record occur, between 5000 – 2500 BCE, and 500 – 1300 AD, coinciding with droughts. This suggests the death of most of the bison population during these periods. In good years, the main herd could number between 30 and 40 million animals, so huge population swings were common. The pollen record from these times also suggests massive overgrazing and periods of vegetative change.

The earliest settlers of Eastern Colorado were the nomadic hunter-gatherers of the Clovis, Folsom, and Plano periods. All of what we know about this time is from the archaeological record, and is often confined to

sources of water, caves, or sites of significance. A key local site is the Dent site, located near the South Platte in Weld County. Discovered in 1932, it was the first archaeological site in the world to show conclusive evidence linking humans and mammoths. The mammoth bones from 12850 BCE showed signs of flaying and cracking – clear evidence of tool use, hunting, and processing.

The bison die-offs mentioned above also had negative effects on the human population. Much of the Plains was de-populated in the period between 5000 – 2500 BCE due to the lack of game. Following this period, hunting focused more on small game, as well as the addition of dogs as dual purpose (meat and pack) animals. Agriculture began to be introduced into Southeastern Colorado around 1000 BCE, evidenced by pollen and the presence of *manos* and *metates* (corn grinding tools). Crops grown included corn, beans, squash, and melons. These crops had been introduced north to the South Platte by 1 AD.

A stable vegetable food source provided an incentive for the nomadic hunter-gatherers to stay in one area for longer periods of time. This had radical effects on the Plains cultures. Rock shelters and caves gave way to dugouts and earthen lodges. Trade became integral to life in this period. Pottery also began to be made for a variety of uses, and institutionalized, large-scale cultural networks began to develop. On the Plains, this period is defined by a development of regional pottery styles, projectiles, and more diversified agriculture. Pottery in Southeastern Colorado is more similar to Ancestral Puebloan pottery, while the rest of the Plains is typified by a rope-like, corded style, similar to that of the Plains Woodland cultures. This speaks to the diverging regional influences in these regions.

The drought of 500 – 1300 AD proved too great a challenge for these fledgling societies to face. Decades of crop failures led to societal collapse and chaos. The

bison population, as well as many small game species, crashed due to lack of forage. Surviving humans reverted to a hunter-gatherer lifestyle for several generations, returning to the old caves that the Clovis man had stored mammoth bones inside ten thousand years before. New groups were also coming from the far north, fleeing resource pressures of their own – the Athapaskan-speaking Apache and Navajo.

As the drought years of the 14th century began to recede, Plains culture began to slowly re-emerge. The Pawnee people developed a complex semi-nomadic, agricultural society in the South Platte and Republican basins in Colorado, Nebraska, and Kansas. They lived in rectangular earth lodges during the agricultural season and winter, and tipis during the annual bison hunt. The Caddoan groups of Southeastern Colorado did not recover from the drought, and this country became home to various Apachean groups. The Ancestral Puebloans retreated to the defensibility of the Rio Grande and formed the various Pueblos in New Mexico, and the Navajo moved into the vacated Four Corners region. A variety of other groups existed on the fringes of these areas at the time, notably the Ute in Colorado.

It was into this chaotic and dynamic environment in the 16th century that the Spaniards walked. Major cultural and lifestyle shifts were already occurring within the native groups. Tentative trade networks were also being re-developed. It is likely that nearly everyone on the Plains had already heard strange tales of the bearded, pale men far to the south, their curious trade items, and their fantastic weaponry. A burial

from ~ 1530 in Cheyenne County contained various shells of Mediterranean origin, meaning Spanish goods had been traded into Colorado nearly a generation before the Spanish themselves.

What Can We Take Away From This As Land Managers?

Drought is an Existential Threat. Before we were able to ensure a stable food supply, sustained drought would kill the game or crops, and most of us would then starve over the course of several generations – an apocalypse. Now we are able to (somewhat) mitigate these effects through agricultural practices. But the ‘death threat’ still exists. Planning for drought is critical, because we cannot predict its intensity.

Land Ethic. The pre-historic settlers of Eastern Colorado viewed land much as we view the air – a limitless, shared, endless resource. These societies were reverential of the inherent power of the land itself – both of its ability to provide, as well as its ability to take life. Respect for the land is integral to good stewardship, as the ranch (or the ground underneath it) will be here long after we’re gone.

Sharing Knowledge Advances Society. Later cultures were superior due to knowledge exchange. The environment was relatively similar – the difference was trade. The crop seeds were from Mexico, the pottery techniques were from Missouri, and the hunting methods were from Montana. Adopting techniques different than our own, while challenging or hard, can often have very beneficial results.

What Can the Past Tell Us About Range Management?

Part II: In Search of the Far Quarter

Don Schoderbek is a Regional Specialist Range Management

Much has been written on the Spanish colonization of the southwestern United States. This narrative often describes the development of missions and resource-hungry *encomiendas* of the Rio Grande Valley in New Mexico, which was the first European settlement in the United States. Meanwhile, French colonization brings to mind the ambitious, genteel frontier settlements of Quebec and la Nouvelle-Orleans; as well as the rowdy *voyageur* traders who operated across the huge territory of New France.

It was through trade on the Eastern Plains of Colorado that these two European neighbors would meet again in North America. In the previous article, I

discussed the growing importance of regional trade networks at the time of Spanish contact. Coronado’s 1540-42 *entrada* into New Mexico and onto the Plains was a failure. However, his report – filled with exaggerations, such as finding rich, black soil – was significant enough to motivate a concerted effort to colonize and settle the Pueblos of New Mexico.

The Spanish *encomienda* system in New Spain rewarded wealthy colonists or soldiers through grants of land and native labor, usually in exchange for patronage of clergy. This replicated the three estates of feudal Europe (nobility, clergy, and a large pool of laborers), using the Pueblo people as indentured labor.

However, this system quickly required more resources than the Pueblos were able to produce, and the Spanish were forced outward in search of goods and labor.

Our knowledge of these early trips probing *el Cuartelejo* (Spanish for ‘the Far Quarter’) is hazy. These expeditions usually had illegal or nefarious motives, such as slaving. For example, the first Spanish in eastern Colorado were a prospecting group of *Chihuahuenses* led by the treasonous Francisco de Bonilla in 1594 or 1595. On the Plains he was stabbed to death by his partner, Antonio de Humana, who then hijacked the expedition, and led them to their later death. The Purgatoire River is named for this group. A series of expeditions in the 17th century also searched for a band of escaped Puebloan people, who lived in a fortified pueblo near current-day Scott City, Kansas.

Meanwhile, French traders were actively exploring the Missouri River drainage. Similar to the early Spanish expeditions, many *couriers-des-bois* (French for wood runners) operated illegally, so there is little record of these early explorers. The French were much more ambitious traders, and also did not expect indentured labor (like the Spanish), so they were able to move about the Plains peoples much more easily and quietly. However, in 1706, Juan de Ulibarri traded in Kiowa County for the kit of a recently murdered French trader, including a new rifle and cookware.

These were unmistakable signs of the French *couriers-des-bois* operating in Spanish territory. In 1720, Lieutenant-General Pedro de Villasur undertook a large exploratory expedition into Eastern Colorado in search of any traces of the French. This expedition was ambushed and massacred by the Pawnee near current-day Columbus, Nebraska, likely with some French awareness. About 40 *presidios* were killed, along with 10 Pueblo allies. This devastated colonial New Mexico – approximately 1/3 of the societal elite were killed, plunging the state into an economic depression. It also forever ended Spanish aspirations on the Plains.

The Pawnee also raided hundreds of horses from Villasur’s large *remuda*. These horses, combined with the product of 18th century horse raiding of the Comanche into New Mexico, drastically altered life for native peoples in eastern Colorado. The Comanche (a branch of the Shoshone) entered southeastern Colorado in the early 1700s, and quickly adopted the horse and a radical new semi-nomadic lifestyle. Other groups such as the Cheyenne and Arapaho also entered eastern Colorado, and rose to regional prominence. These groups hybridized dependence on the bison with the raiding of lucrative agricultural targets.

The rapidly intensifying warrior cultures on the Plains stunted European exploration of the region. In 1739, a colorful (and semi-illegal) French trading party, led by the brothers Pierre and Paul Mallet, attempted to travel from Illinois to New Spain. Amazingly, this group “discovered” the South Platte, where they met Villasur’s abandoned trail south to Santa Fe. They were well received and wintered there, and then travelled back to New France via the Canadian River to New Orleans in 1740. However, their further expeditions were blocked by the emboldened Comanche.

Later in the 18th century, economic conditions for the Spanish continued to deteriorate with increased raiding. The French Revolution and wars in Europe also diverted much attention from both France and Spain. Napoléon’s military actions depleted the new French Republic of its treasury, and in 1805 he sold New France to the United States – the Louisiana Purchase. The next year, a young American named Zebulon Pike entered eastern Colorado along the Republican River. His 1806-7 expedition signified the beginning of a new era in Colorado, one that would strike the death blow to the bison, and bring domestic livestock and modern agriculture to our region.

What Can We Take Away From This As Land Managers?

Adopt New Technology. The acceptance of the horse by Plains cultures revolutionized their way of life. It also allowed them to effectively counter superior forces for much of the 18th and 19th centuries. This speaks to the importance of early adopters of technology, and how quickly it can drive cultural shifts.

Have Operational Flexibility. The French were more successful on the Plains because they travelled in small groups, usually by water, and emphasized trading. They actively modified their strategy to local cultures and conditions. We can take the same approach in range management – be aware of what works and doesn’t locally, and modify your business accordingly.

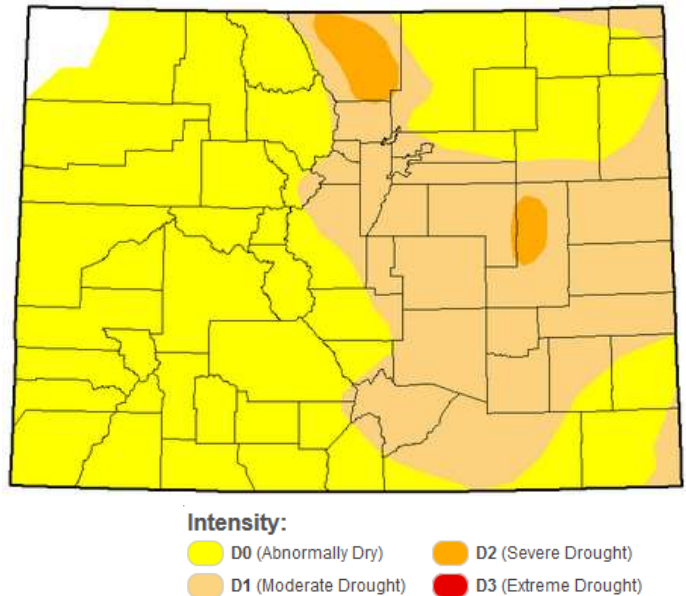
Know Carrying Capacity. This is a range term for the number of animals a certain pasture can support. However, it is also used in social science to describe the number of people an area can support. The Spanish exceeded the carrying capacity of the Southwest because they misjudged resource availability. This doomed the settlements to a marginal existence. This can also be an allegory for the ranch – if you misjudge the amount of forage in your pastures and overstock, it can be a recipe for failure.

Observations From the Range...

Drought Update

Drought conditions continue to intensify over Eastern Colorado. Only 1.6 % of the state is NOT in drought. There are two areas of severe drought in Larimer and Lincoln counties. The severe drought in Lincoln Co. is centered along Big Sandy Creek between Limon and Hugo. Moderate drought has also moved into a large area of east-central Colorado. Snowpack levels also are a concern for statewide rivers (10 – 15 % of normal). The driver behind this is a weak La Niña, which will be with us through 2017. Utilizing sound range management practices is a good way to weather the effects of drought. It is paramount to pay attention to your stocking rate (AUM/ac). Rangeland is especially susceptible to overgrazing at the onset of drought, because plants need all the resources they can to get through the drought. A good solution to this may be reducing your stocking rate, or implementing a range management plan.

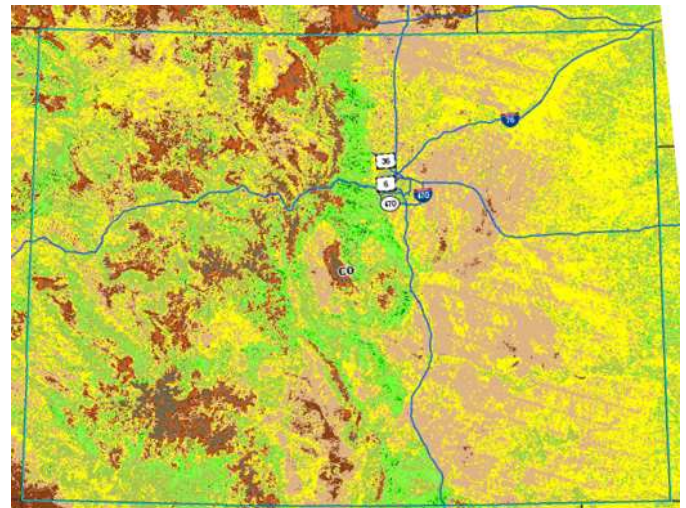
Colorado Drought Conditions
Dec 1 2016



Vegetation Condition and Outlook

Range conditions are generally good across Eastern Colorado. This is because we received decent growing season moisture in most places. However, there is a great deal of local variability (i.e. Lincoln County). Many folks region-wide have taken advantage of this standing forage by holding back calves or buying stockers. Stockers are especially good to incorporate into your operation in times of economic and weather variability. This is because they have a quick turnaround time (2 – 8 months). This adds an element of flexibility into the traditional cow-calf model. Going into a potential drought in 2017, it is important to pay attention to your forage plants, and what they are telling you. A good judge of the plant community is supplement usage levels. Think about any recent changes, and what could be driving that in the plant community.

Colorado NDVI
Week of 11/28/2016



LIVESTOCK

Holstein and Beef Production

Chris Shelley, Area Livestock Agent

In 2014, the United States cattle inventory reached its lowest since the early 1960. The USDA National Ag Statistics Survey estimated this number to be about 88 million. The current 2016 inventory has risen to just shy of 92 million, but cattle supply is still a challenge facing the industry. Colorado's cattle inventory however, has continued intact, remaining around 2.7 million head since 2007. Despite the state and national difference in cattle herd numbers, many have looked for alternative sources to minimize the disparity between supply and demand. Interest in feeding Holstein steers for beef production has risen in recent years, even despite lower beef prices. The Holstein breed falls into the same genus and species as traditional beef breeds, *bos taurus*, and carcass characteristics can also be fairly similar as well. Taste tests have showed that Holstein steer beef has an overall flavor that was comparable to that of Premium Choice Angus beef and more desirable than that of Low Choice Angus and Select Angus beef products. Although there are similarities, Holstein steers are a novelty for most cattle feeders and come with their own unique set of challenges. This article will focus on research and industry trends in Holstein steer feeding.

The Holstein breed is well known for its milk production abilities. When considered for beef production, feeders need to be aware of the differences in Holstein steers when compared to traditional beef breeds. Holstein steers have increased maintenance requirements, less efficient fat deposition and consume more feed over the length of the feeding period. Holstein steers can utilize energy for protein production more efficiently, produce greater weight gains, and marble with less external body fat. Feeders can increase feed efficiency by feeding high-energy diets. On average, when Holstein steers enter the feedlot they weigh 310 pounds and are about 100 to 120 days old. The entrance age and weight has some challenges when compared to traditional beef breeds that are much older and heavier when moved to feeding operations. Heavier calves are less likely to become sick in the feedlot. Holstein steers are further challenged with greater inflammatory responses to pathogens and may fair less favorably when exposed to the same diseases as beef cattle. The early age also means that they will remain on feed for upwards of 350 days to reach the finishing weight of 1300 pounds. The challenge exists of minimizing days on feed without affecting the marbling and weight gain.

Holstein steers are traditionally fed a single diet while on full feed. Under these circumstances, they will gain about 2.8 pounds per day. Without careful consideration of calf nutrient requirement and an in-kind tailored diet, performance may be compromised. A typical Holstein diet may contain 12-13% protein and 8% roughage. While this diet may be the best choice over the course of the entire feeding period, protein deficiency is likely during early stages of feeding. Growth and feed efficiency may be stagnated if the diet is not tailored for specific growth phases. These feedlot diets, high in energy and easily fermentable carbohydrates, can lead to acidosis and liver abscesses over extended periods (350 days) if not monitored carefully. Feeding operation efficiency is also dictated by the month the steers enter the feedlot as Holsteins are affected more by extreme weather conditions. Steers that enter during late summer and early fall will perform less efficiently as they will finish during the hottest point of the year. Holstein steers will also consume more water on average than conventional beef breeds necessitating more pen and shade spacer per head. For optimal performance, Holstein steers need a three-sided windbreak, shade and access to mud free areas.

When considering the economic feasibility, all of the aforementioned considerations come into play. Additional economic considerations are costs are needed for facilities, market outlooks (longer on feed) and farm nutritionist expenses. Utilizing Holstein steers in beef production is most effective when cattle demand and beef prices are both high. As with any other business, it is vital to have a business plan and show economic viability prior starting. As we continue to learn more about feeding Holstein steers and their place in beef production, emphasis needs to be placed on enterprise budgets, marketing strategies and efficient nutritional management. For more information on feeding Holstein steers, contact your local Extension office.

AG MARKET PRICES

Dennis Kaan, Golden Plains Area Director

LIVESTOCK CASH PRICES				Week Ending 11/25/16		
				Current ¹	One Month Ago ²	One Year Ago ²
Colorado Auction Feeder Cattle, Medium & Large Frame #1						
Steers,	500-550 lbs	/cwt	\$132.00-152.00	\$110.50-131.00	\$175.00-219.00	
Steers,	600-650 lbs	/cwt	\$113.00-128.00	\$104.50-127.00	\$169.00-199.00	
Heifers,	500-550 lbs	/cwt	\$119.50-136.00	\$100.50-119.50	\$161.00-190.00	
Heifers,	600-650 lbs	/cwt	\$108.0-120.00	\$103.00-115.00	\$154.00-174.00	
Colorado Weekly Weighted Average Direct Slaughter Cattle, FOB the Feedyard After 3-4% Shrink						
<u>Live Basis Steer Sales</u>	Hd Count	Wt Range	/cwt	/cwt	/cwt	
Over 80% Choice	788	1,400-1,545	\$108.00-110.00	\$98.00-101.00		
65-80% Choice	784	1,400-1,500	\$110.00	\$99.50-102.00	\$129.00-130.00	
35-65% Choice	1,618	1,319-1,545	\$108.00-110.00	\$98.00-102.00	\$130.00	
0-35% Choice						
<u>Live Basis Heifer Sales</u>	Hd Count	Wt Range	/cwt	/cwt		
Over 80% Choice	681	1,288-1,375	\$109.00-110.00	\$97.00		
65-80% Choice	161	1,175-1,250	\$109.00-110.00	\$98.00		
35-65% Choice	504	1,250-1,275	\$110.00	\$98.00	\$130.00	
0-35% Choice						
Mountain Area and Western U.S. Direct Sheep Report, Medium and Large 1-2						
	Hd Count	Wt Range	/cwt	/cwt	/cwt	
Feeder Lambs			No Trade Reported	No Trade Reported	No Trade Reported	
Hogs, As of 11/18/13						
Base Market Hog, 200 lb. Carcass Basis, Plant Delivered						
0.9-1.1" Back-Fat, 6.0/2.0 Loin Area/Depth	/cwt	\$37.50-41.51	\$42.00-46.50	\$48.00-50.50		
Iowa -Minnesota Daily Negotiated Purchases 200 lb Carcass Basis						
1.0" Back-Fat, 6.0/2.0 Loin Area/Depth	/cwt	\$38.00-42.00	\$44.00-46.50	\$50.00-51.50		
Western Cornbelt Daily Negotiated Purchases 200 lb Carcass Basis						
1.0" Back-Fat, 6.0/2.0 Loin Area/Depth	/cwt	\$38.00-42.00	\$44.00-46.50	\$48.00-51.50		
LIVESTOCK FUTURES PRICES				11/25/16		
Live Cattle - CME				Current ¹	One Month Ago ²	One Year Ago ²
Dec	/cwt	\$109.35	\$101.15	\$130.67		
Feb	/cwt	\$110.17	\$101.87	\$132.65		
Apr	/cwt	\$109.85	\$102.80	\$132.55		
Jun	/cwt	\$101.00	\$102.07	\$123.80		
Feeder Cattle - CME						
Jan	/cwt	\$124.05	\$121.87	\$175.07		
Mar	/cwt	\$119.75	\$119.70	\$164.55		
Apr	/cwt	\$119.25	\$115.50	\$160.92		
May	/cwt	\$118.60	\$113.25	\$162.40		

¹ Commodity specifications apply to the current period only. Specifications may have been different for prior period listings.

² Prices reported for the one month ago and one year ago periods are taken from previous issues of this publication.

Source: U.S.D.A. Agricultural Marketing Service
Chicago Mercantile Exchange

<http://www.ams.usda.gov/market-news>
<http://www.cmegroup.com/>

CASH GRAIN PRICES**11/25/16**

		Current ¹	One Month Ago ²	One Year Ago ²
#1 HRW Wheat				
Fleming, Haxtun, Julesburg, Holyoke, Paoli, Amherst	/bu	\$2.74-3.12	\$2.73-3.10	\$3.83-3.90
Yuma, Wray, Brush, Akron, Otis, Anton	/bu	\$2.62-2.72	\$2.65-2.75	\$3.90-3.98
Burlington, Seibert, Flagler, Arriba, Genoa, Hugo	/bu	\$2.76-2.77	\$2.67-2.72	\$3.93-3.98
#2 Yellow Corn				
Haxtun, Julesburg, Fleming, Holyoke, Paoli, Amherst	/bu	\$3.01-3.06	\$3.03-3.08	\$3.37-3.44
Yuma, Wray, Brush, Otis, Anton	/bu	\$2.96-3.06	\$2.97-3.07	\$3.35-3.55
Seibert, Arriba, Burlington, Flagler, Bethune, Stratton	/bu	\$2.86-2.91	\$2.88-2.92	\$3.30-3.40
Northeast Colorado, Western Nebraska Beans				
Pinto Beans	/cwt	\$30.00	\$30.00	\$20.00
Great Northern Beans	/cwt	\$30.00	\$30.00	\$18.00
Light Red Kidney Beans	/cwt	\$32.00-33.00	\$32.00-33.00	Not Established
White Millet				
E Colorado / SW Nebraska	/cwt	\$5.85-5.00 Mostly \$5.00	\$5.00-5.00 Mostly \$5.00	\$5.50-6.25 Mostly \$5.50-5.75
Sunflowers				
E Colorado / SW Nebraska	/cwt	\$15.50-17.00	\$16.50-17.00	\$16.25-17.00

GRAIN FUTURES PRICES**11/25/16**

		Current ¹	One Month Ago ²	One Year Ago ²
Wheat, Kansas City Board of Trade				
Dec	/bu	\$4.12	\$4.14	\$4.95
Mar	/bu	\$4.29	\$4.35	\$4.97
May	/bu	\$4.42	\$4.50	\$5.01
Jul	/bu	\$4.53	\$4.62	\$5.02
Corn, Chicago Board of Trade				
Dec	/bu	\$3.46	\$3.52	\$3.58
Mar	/bu	\$3.54	\$3.62	\$3.65
May	/bu	\$3.60	\$3.69	\$3.71
Jul	/bu	\$3.67	\$3.75	\$3.77

CASH HAY PRICES**Week Ending 11/25/16**

		Current ¹	One Month Ago ²	One Year Ago ²
Colorado Hay Report, Northeastern Areas				
Large Square Bales, FOB Stack				
Supreme Alfalfa, 180+ RFV (On Contract)	/ton	\$174.00	\$240.00-250.00	
Premium Alfalfa, 150-180 RFV	/ton			
Good Alfalfa, 125-150 RFV	/ton	\$100.00	\$167.00	
Fair Alfalfa	/ton			
Utility Alfalfa Delivered	/ton			\$95.00
Premium Grass (Large Squares)	/ton	\$240.00	\$240.00	\$120.00
Premium Grass (Small Squares)	/bale	\$6.00-7.00	\$6.00-8.00	
Straw (Large Squares)	/ton			
Corn Stalks (Large Squares)	/ton			\$45.00
Oats (Large Squares)	/ton			
Cane Hay (Large Rounds)	/ton			
Millet Hay (Large Squares)	/ton			

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GOLDEN PLAINS AREA AG NEWSLETTER

- 1.....2016 Golden Plains Area Ag Handbook Orders
- 2.....Navigating the Online Energy Information Landscape
- 2.....Colorado Agricultural Energy Efficiency Program
- 3.....Economic and Environmental Potential of High Plains Cover Crops
- 4.....Project Learning Tree and Environmental Education Council Meeting
- 4-5.....Late Blight
- 5-6.....Squash Bees
- 6.....More Freeze Damage
- 7-8.....What Can the Past Tell Us About Range Management? Part I
- 8-9.....What Can the Past Tell Us About Range Management? Part II
- 10.....Observations From the Range...
- 11.....Holstein and Beef Production
- 12-13.....Agricultural Handbook Order Form
- 14-15.....Ag Market Prices