

# Logan & Morgan Agriculture & Natural Resources Newsletter

The combined Logan & Morgan Ag and Natural Resources Staff provide this newsletter to provide upcoming events and news on current issues affecting agricultural businesses, rural land owners and urban landscape managers.



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## 2013 Calendar: (information provided in flyers or articles)

- Feb 5<sup>th</sup>, 6<sup>th</sup>, & 7<sup>th</sup> – Nebraska Panhandle Wheat Tech Conference Flyer
- Feb 11<sup>th</sup>, 12<sup>th</sup>, 13<sup>th</sup>, & 14<sup>th</sup> – Pesticide Applicator Recertification Credit Programs: Ft Morgan, Sterling, Holyoke, & Akron – Article
- Feb 12<sup>th</sup> & 13<sup>th</sup> – AgrAbility – Holyoke & Ft Morgan - Flyer
- Feb 12<sup>th</sup>, 19<sup>th</sup>, 26<sup>th</sup>, Mar 5<sup>th</sup>, & 12<sup>th</sup> – Drought Summit series- 11 to 1:00 – Burlington, Akron, Yuma, & Holyoke Adobe Connect Flyer
- Feb, 13 & 14 Colorado Agriculture Big & Small Conference Adams County Fairgrounds – Flyer
- Feb 28<sup>th</sup> – Wheat Summit - Article
- May through September - High Plains Native Plant Master Courses Article

## Area Colorado State Extension Websites:

- **Logan & Morgan Ag & Natural Resources:**
  - <http://www.extension.colostate.edu/morgan/crops/>
- **Logan Extension:** <http://extension.colostate.edu/logan>
- **Morgan Extension:** <http://extension.colostate.edu/morgan>
- **Golden Plains Area:** <http://goldenplains.colostate.edu/>
- **NE Colorado Range:** <http://range.colostate.edu/>
- **Colorado State Extension:** <http://www.ext.colostate.edu/>

## **Coping with Drought – Irrigated Corn I – Bruce Bosley**

All indications are that farmers will very likely have to cope with another hot and dry growing season in 2013. This prospect is especially troubling to irrigators in the South Platte river basin where mountain snowpack is low and likely to remain that way and many reservoirs are still empty or near so. We all hope that the weathermen are wrong. In case they are right here are cropping suggestions based on University research on limited irrigation corn production and farm experience.

Pay attention to weeds. Weeds compete for moisture, sunlight, and soil nutrients with all crops including corn. Keeping weeds from robbing soil moisture is especially important at and prior to seeding. Fields having adequate soil moisture for germination and early season growth can have much of it lost to early season weed growth. Weeds growing the previous year in late summer and fall can also use up much of the late summer and fall rainfall moisture storage. As much as four inches of captured soil moisture can be lost to spring planted crops by not controlling weeds.

High crop residues have helped dryland producers increase their wheat and summer crop yields. Snow falling in wheat stubble and other standing crop residue can significantly enhance winter soil moisture capture and storage. Depending on the winter, many inches of moisture can be gained from snow falling in a field or capturing snow blowing from bare fields nearby. In addition the old crop stubble cools soils and enhances soil capture of rainfall.

It's too late this year to bring back crop residues that have been fall tilled but planning for drought in future years may include high residue farming systems like strip tillage and ridge tillage. These systems have the advantage over no-till in allowing some soil warming over the plant row. Some farmers can make these systems work on furrow irrigated fields but their farming systems are more involved that can be covered here. These systems are very easy to use on sprinkler irrigated fields.

Corn farmers who face shortages of irrigation water supplies can optimize yields by withholding irrigations in the vegetative growth stage of corn development so that more can be applied at the critical corn reproductive growth stages. In a seven-year limited irrigation continuous

corn study no irrigation was applied until corn had reached the 4<sup>th</sup> leaf growth stage even on the full irrigation treatment. A half inch was applied and an inch was applied at the 8<sup>th</sup> leaf stage on the driest treatment in a very dry year. These irrigations were provided to get plants to the reproductive growth stage. Study yields, not reduced by hail or frost, averaged 191 bushels for the unlimited irrigation (15") water treatment and varied from 183 to 212. Using only 10" of water or 5" short the average yield was 178 with a high of 205 and a low of 165 bushels per acre. The 5" irrigation treatment, 10 inches short, resulted in average - 135, high -152, and low -115 bushels respectively. Finally the study included a zero irrigation treatment resulted in an average of 76 bushels with a high of 90 and low of 60 bushels.

Managing corn with limited irrigation takes a change in one's whole cropping system. It also takes a change in one's ability or mindset that copes with managing risks. Traditionally irrigators cope with crop water risks by overwatering so that crop water stress never or rarely occurs. Dryland farmers in the western high plains learned early to cope with drought risks that are frequent and sometimes intense. They've developed cropping systems to cope with drought. If and when limited irrigation becomes common or the normal, many irrigators will develop their own systems to cope with these risks.

## **Coping with Drought – Irrigated Corn II – Bruce Bosley**

High corn yields can be achieved with limited irrigation water supplies when the corn crop is part of a rotational cropping system. News to some, Corn grown following wheat and soybeans very often out-yields corn grown following corn or in continuous corn systems. Adding other crops in rotation with corn can also reduce total season water use to boot.

Joel Schneekloth, Colorado State's Water Resources Specialist for Northeastern Colorado conducted a multi-year irrigated crop rotation trial on a Burlington area center pivot irrigated farm. This trial was completed in 2009. Corn yields in this trial were on average thirty bushels higher following soybeans compared to yields where corn followed corn. In addition, corn yields two growing seasons after a soybean crop resulted in a ten bushel

boost compared to the field area having continuous corn.

Irrigated wheat was also included in this same trial. Rotations where corn was planted the year following winter wheat averaged fifteen bushels more than where corn followed corn. Irrigation requirements for wheat are several inches less than for corn. The time for field work for wheat and corn are different and allows for spreading workload.

The field production practices, including fertilizer and irrigation and plant were managed for maximum production. Consequently corn yields in this field averaged over 260 bushels in most locations in 2010. Soybean and yields during the trial were also excellent while wheat yields were adequate. Contact Joel Schneekloth for more information on these trials.

Neil Hansen, CSU Soil & Cropping Systems Associate Professor, has led work on a set of limited irrigation trials in a farmer's field near Iliff Colorado. The trials compared different crop rotations and different water reduction strategies against fully irrigated corn. The soils and irrigation water quality limited yields in this field but all treatments were subject to the same soil and water quality limitations.

In this study irrigated continuous corn production was compared to an irrigated corn & non-irrigated fallow rotation as well as a four year rotation of irrigated corn, irrigated soybeans, non-irrigated winter wheat and non-irrigated forage triticale. Crop yield and rotation water use were measured and compared between these three production strategies.

### **Continuous cropping reduces yields of winter wheat** – *Adapted from Rob Aiken & colleagues.*

Available soil water reserves limit dryland wheat production especially when combined with growth season precipitation shortages. Optimizing dryland wheat productivity normally includes careful management of the previous crops and fallow in a way that best captures and retains precipitation in the soil prior to wheat planting. In addition delayed planting and good growing season management can further optimize soil and precipitation crop water use. According to David Nielson, USDA-ARS Crop Scientist at Akron, about 6/7<sup>th</sup> of total yield variability is attributed to planting-time soil moisture reserves. One out of seven years, wheat

Continuous corn averaged 152 bushels per acre and used 24.6 inches of evapotranspiration (ET) water. The ET water use was measured from field inputs, irrigation and precipitation, and from the depletion of soil stored moisture. The corn yields from the corn-fallow rotation were 197 bushels or 35 bushels more than the average for continuous corn. However, the average annual production for this rotation was only 98.6 bushels per acre. The average corn-fallow rotation ET was 16.6 inches.

Corn production in the four year rotation treatment averaged 179.8 bushels, soybeans – 30.4 bushels, wheat – 43.6 bushels, and forage triticale 2.9 tons per acre. The average annual rotation ET was 17.1 inches. This rotation produced grain and forage every year.

Neil's summary of this study is that corn yields are improved when it follows fallow or other crops in rotation. In addition if one wants to save water use on land but maintain high corn yields the same water savings can be achieved by raising some non-irrigated crops in rotation with the corn as compared to that when no crop is raised in fallow between crops. The rotational crops generate income while fallowing land doesn't and there are still costs to maintaining weed free fallow.

At today's corn prices I don't presume that I'll get anyone to switch to other crops if water and other inputs are not limited. However, if water for irrigation is limited, including other low water use crops in rotation with corn can provide for optimum income and still farm with less water availability.

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receives the right combination of precipitation and good growing conditions throughout the growing season of winter wheat.

Rob Aiken, et Al, noted that while producers sometimes replace the summer fallow prior to wheat planting with another crop such as spring canola. Cropping system studies have shown that planting a summer crop can increase the efficient use of precipitation. However, crop production in the summer prior to planting winter wheat can reduce soil water supplies for that wheat crop compared to summer fallow.

Rob's study was designed to determine the importance of stored soil moisture at wheat planting time on the yield and quality potential of winter

wheat following a summer fallow treatment versus a spring canola treatment. Both treatments were part of a wheat, corn (or grain sorghum), and fallow/spring canola rotation. The study was conducted over several years from 2002 through 2008.

The scientists found that the wheat grain yield of the continuous cropping treatment was reduced by 31% compared to the rotation including fallow prior to wheat planting. Furthermore, their economic analysis showed that the continuous cropping reduced wheat profitability by 56%. They found an 18% impact on wheat biomass production of the continuous cropping rotation in comparison to the fallow treatment. This gives more support to David Nielson's research that planting time soil moisture is critical for optimum wheat productivity.

These studies and others may also give guidance to the use of cover crops in our semi-arid region. For example; researchers in a Missouri cover crop study last summer (2012) found that non-irrigated corn yields were the highest with the cover crop treatment planted in the late summer-fall time period of 2011 that had the least growth and water use. They also experienced record heat and drought in 2012.

My take is that farmers need to critically consider their cropping rotations in order to both optimize profitable crop production and water use. Fall planted crops such as winter wheat; forage grasses and alfalfa require good soil reserves for optimum establishment, overwintering success, and subsequent spring-summer production.

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## **Native Plant Master Logan/Morgan/Phillips County – Brian Kailey**

### **Just 20 spots open per course!**

Have you always wanted to learn how to identify the beautiful plants that grow in nature? Would you like to learn more about using them in your landscape or learn how to distinguish natives from noxious weeds? Take a Native Plant Master Course!

Learn more about the beautiful plants that grow in nature. Use them in your landscape. Take a Native Plant Master class and get to know the plants of Colorado.

#### **Native Plant Master Mission:**

To educate the public about native plants in order to foster stewardship, sustainable landscaping and management of weeds that threaten native ecosystems.

#### **What is Native Plant Master?**

Native Plant Master Instructors teach courses on trails in local open space parks and other public lands. This means participants see firsthand the plants inhabiting the ecosystems and life zones that are unique to the area. Colorado has a wealth of native plants, colorful wildflowers, grasses, shrubs

#### **How to get signed up?**

Call 970-522-3200 ext 281, stop by the extension office at 508 S. 10<sup>th</sup> Ave. Sterling, CO

and trees, which are well adapted to our variable climate, soils, temperatures and elevations. Recommended by the Colorado Native Plant Society, native plants are great for landscaping because of their adaptability.

#### **Native Plant Master Impact:**

Thousands of Coloradans are annually educated by a few hundred NPM volunteers. The team annually measures this impact through a survey asking program participants to report on sustainable landscaping and weed mitigation projects they complete. In 2011, volunteers from across the state reported a combined savings of \$44,920 from reduced landscape inputs such as water, pruning and pest control as a result of planting native species on more than 85,000 acres of public and private land.

Volunteers also reported a combined \$50,475 in savings from improved grazing, crop output, ornamental landscapes, wildlife and tourism, and beginning or increasing weed control efforts of non-native plants—on more than 79,000 acres of public and private land. These figures indicate that CSU Extension has found a cost-effective way to increase the sustainability of Colorado's public and private landscapes while reducing invasive weeds.

8075, or fill out the form and email it to me at [Brian.Kailey@colostate.edu](mailto:Brian.Kailey@colostate.edu)

## Native Plant Master (continued)

**Times and locations (all programs held on Saturdays):**

**Deadline to sign up for classes is Thursday, May 9<sup>th</sup>**

- (May 18<sup>th</sup>, 25<sup>th</sup>, & June 1<sup>st</sup>) We will meet at the Sterling visitor center at 7:30 am and rap things up at about 12:00 pm
- (July 13<sup>th</sup> & July 20<sup>th</sup>) 13<sup>th</sup> To Trail Ridge road Rocky Mountain National Park - this will be an all day event. We will meet at the Morgan County extension office at 6:30 am and be back around 8:00 pm. On the 20<sup>th</sup> we will meet at the Sterling visitor center at 7:30 am
- (August 24<sup>th</sup>, 31<sup>st</sup>, & September 7<sup>th</sup>) Meet at the Akron fair grounds at 7:30 we will conclude our day around 12:00 pm

### Botany Overview:

**Private & Commercial Applicator Credits Offered** – Ron Meyer, *Golden Plains Area Agronomist*

Private pesticide licenses are valid for a 3-year period. During this 3 year period, applicators are required to earn 7 credits to renew their licenses without having to retest. These sessions meet the 7 credit requirement for private applicators as mandated by the Colorado Department of Agriculture.

Commercial applicators will be able to earn the 7 core credits from the private applicator sessions plus the following credits for the commercial categories: agricultural weeds, agricultural insects, range, and right-of-way at the Akron site.

#### Dates, Times, & Location

February 11, 2013 - 1 to 5:00 p.m., Fort Morgan Extension Office 7 core credits  
February 12, 2013 - 5:30 to 9:15 p.m., Sterling Extension office 7 core credits  
February 13, 2013 – 8:00 to Noon, Holyoke Community Center 7 core credits  
February 14, 2013 – 8:30 to Noon, Akron Extension Office 7 core credits

Prior to the start of classes Bruce Bosley will lead a botany overview. This overview will take place on May 16<sup>th</sup> from 6-8 pm at the Sterling Regional Engagement Center located at 304 Main Street Sterling, CO 80751. During the Native Plant Master course the instructors will be using botany terminology to describe plant material; thus it's a good idea to get aquatinted with this terminology prior to taking a class. The overview is open to anyone interested in learning more about the language of a botanist.

**For more information on Native Plant Master:** Call Brian at 970-522-3200 ext 281 you can find the application at <http://www.extension.colostate.edu/logan/> and for more information you can visit the NPM website at <http://www.extension.colostate.edu/jefferson/npm/npm.shtml>

February 14, 2013 – 1:30 to 5:30 p.m., Akron Extension Office 4 commercial credits

#### **REGISTRATION:**

February 11<sup>th</sup> or 12<sup>th</sup> sessions at: Fort Morgan or Sterling - \$35 registration. Send to: Logan County Extension Office, 508 S. 10<sup>th</sup> Ave., Suite 1, Sterling, CO 80751-3408.

February 13<sup>th</sup> or 14<sup>th</sup> sessions at: Holyoke or Akron - \$35 registration. Send to: Kit Carson County Extension Office, 251 16<sup>th</sup> St., Suite 101, Burlington, CO 80807.

February 14<sup>th</sup> p.m. commercial credit session at: Akron - \$40 registration. Send to: Kit Carson County, 251 16<sup>th</sup> St., Suite 101, Burlington, CO 80807.

Registration can also be done electronically by visiting the Golden Plains Area website at <http://goldenplains.colostate.edu> and click on the "Pesticide Credits" link.

Credit Cards will be accepted locally, however, call and register for the site to reserve a spot.

## Wheat Summit

Colorado State University Extension is hosting a Wheat Production Summit on Thursday, February 28<sup>th</sup>. Registration for this event is \$20 per person. Lunch will be included. Location is the Burlington Community Center, 340 S. 14<sup>th</sup> St., Burlington, Co. CCA credits are pending approval.

Registration can be done on-line at: <http://goldenplains.colostate.edu>. Registration can also be accomplished by sending a check to: Kit Carson County Extension, 251 16<sup>th</sup> St. suite 101, Burlington, Co 80807. Credit cards will be accepted at the door also, but call in a reservation to reserve a spot at 719 346 5571.

### Wheat Summit topics and Schedule:

8:20 a.m.	Registration & Coffee	11:30	Kansas Wheat Breeding and varieties: Guorong Zhang, Wheat Breeder
8:55	Welcome Remarks & Schedule: Ron Meyer, CSU Extension	12:00 – 12:45	Lunch Break---door prizes
9:00	Wheat Crop Status in US and Global: Darrell Hanavan, Executive Director, Colorado Wheat	12:45	Syngenta Wheat Breeding and varieties: Jon Rich, Wheat Breeder
9:15	Colorado Wheat Breeding and varieties: Scott Haley, Wheat Breeder	1:15 p.m.	Importance of Plant Variety Protection: Mark Henry, Henry Law Firm
9:45	Limagrain Wheat Breeding and varieties: Marla Hall, Wheat Breeder	1:45	Water Management: Neil Hansen, CSU Soil and Crop Science Dept.
10:15	Morning Break (wheat breeding overviews: successes and future)	2:15	Afternoon Break
10:30	Nebraska Wheat Breeding and varieties: Stephen Baenziger, Wheat Breeder	2:30	Wheat Agronomics: Bruce Bosley, CSU Extension Agronomist
11:00	Monsanto Wheat Breeding and varieties: Sid Perry, Wheat Breeder	3:00	Seed Certification: Rick Novak, CSU Seed Certification Specialist
		3:30	2013 Wheat Market: Mike Martin, Con Agra Grain
		3:50	Wrap-up---door prizes