

News from the High Plains Ag Lab

UNIVERSITY OF
Nebraska
Lincoln

Hello Ag Lab Board Members,



The 40th anniversary of the Ag Lab is coming up on June 17 and we are going to celebrate. We have a big reason to celebrate when you consider what has been accomplished in the last 40 years. Back in the early 1960's, a group of farmers who were interested in promoting research in production agriculture, got together and made things happen. When the Sioux Army Depot was scheduled to be phased out, these farmers recognized the opportunity to obtain some land for an "experiment station" that would benefit the Panhandle and specifically Cheyenne County. They called legislators, drove to Lincoln to make their voices heard, and finally influenced the legislature to obtain three sections of land from the U.S. Government. These three sections make up the present day Ag Lab. We are celebrating not only what they began, but also the work that has been done since then. If we are to continue to keep the Ag Lab viable for the future, we as present day board members will also need to "step up to the plate" and play an active role in promoting issues of importance.

We will be accepting volunteers who can help with the details of the celebration. Thanks to Leon Kriesel, Doug Schmale, and Jerry Radke, who have already volunteered to help. I will be making calls to solicit more help from you when the time gets closer. Any suggestions you have would be greatly appreciated.

The plans so far are to have a regular June-type field day beginning at 3:00 P.M. and then to have a meal provided by the Nebraska Wheat Board. There will be a dinner speaker—Dr. John Oades with U.S. Wheat Associates has agreed to come and talk about wheat export standards. The Nebraska Wheat Growers will bring their mobile baking lab, and Kathy Buttle will present her rainfall simulation demonstration. We'll have an antique equipment display from the Farm and Ranch Museum in Gering. A special treat for all the farmers will be an equipment demonstration using an air seeder, sprayer, fallow master, and other tillage tools. In addition we hope to have a drawing of the proposed new research/extension building for the Ag. Lab.

The anniversary celebration will truly be an occasion for commemorating what has been done in the past as well as an opportunity to be a part of making a positive impact on the future of agriculture in the panhandle.

*Respectfully,
Don Cruise, Chairman
Ag Lab Advisory Board*

Mark your calendars:

June 17, 2010: June Field Day and 40th Anniversary Celebration. For details watch panhandle.unl.edu/hpal

Contact the High Plains Ag Lab:

Phone: 308-254-3918

On the Web: panhandle.unl.edu/hpal



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Update from the manager:

March 31, 2010: Spring has sprung, and the flood gates have opened some. Many of you are trying to finish last year's millet harvest before the next round of rain and snow. Good luck with that project. Here at the High Plains Ag Lab, we are seeding our oats and peas for forage, getting ready to do some spraying, repairing pasture fence, and plot work has begun. Looks like it could be an interesting year.

Plans have been discussed, laid, and work has begun on preparing for our 40th anniversary field day to be held on June 17, 2010. Looks like it's going to be a fun and informative day. Hopefully you all can be there, and we have a good turnout. There is only going to be one field day this year, so don't miss this one.

As we stand right now, looks like we are not in too bad of shape with our budget, but as with everyone that status depends so much upon weather conditions,

crop yields, crop prices, and keeping disasters from hitting in the way of repairs and un-expected expenses. We are watching our expenditures very closely.

Looking forward to working with some new faculty this year. Jeff Bradshaw is the new entomologist, and has plans to be doing some work here. Karla Jenkins is the new livestock specialist, and has numerous ideas about working with forages, and with grazing rotations. These may take a year or so to get implemented. Dipak Santra is in his second year now, and I'm sure that he has many projects in the works dealing with crop breeding.

Have a safe and productive year, and we will see you on the 17th of June.

*Tom Nightingale, Manager
High Plains Ag Lab*

NI04421: A new wheat for the Panhandle

NI04421 is a hard red winter wheat (*Triticum aestivum* L.) cultivar developed cooperatively by the Nebraska Agricultural Experiment Station and the USDA-ARS, and predicted to be released in 2010 by the developing institutions and the Wyoming Agricultural Experiment Station.

NI04421 was released primarily for its superior performance under irrigation and rainfed conditions in western Nebraska. Additionally, in eastern Wyoming NI04421 has demonstrated superior performance under irrigated and limited irrigated conditions. NI04421 was selected from the cross NE96644/Wahoo (sib) where the pedigree of NE96644 is Odesskaya P/ Cody//Pavon 76/*3 Scout 66.

Based upon accumulated data, NI04421 is superior to many currently grown cultivars in western rainfed (west of North Platte, where drought is common) and irrigated production sites. It seems to have good drought tolerance and does best in irrigated environments in the drier areas. Across the 15 rainfed environments from 2007-09 in the Panhandle, NI 04421 (56.5 bu/a) was second only to Settler CL (57.0 bu/a). Across 14 irrigated environments from 2006-09 in Nebraska and Wyoming, NI04421 (93.8 bu/a) was second only to Bond CL (94.2 bu/a), but NI04421 had better test weight, and less lodging. Across all nine Wyoming



environments NI04421 averaged 85.6 bu/a, 11.1 % protein, 60.7 lbs/bu, and 24 inches in height. It exceeded Wesley by 7.3 bu/a, 0.3% protein, 0.9 lb/bu, and 1 inch in height.

As opposed to some irrigated wheat cultivars that have excellent potential when conditions are optimal, NI04421 does best in high yielding irrigated environments where some stress tolerance is beneficial, but not as well in extremely high yielding irrigated environments. Seed treatments are recommended for NI04421 as it is susceptible to stinking smut (syn. common bunt) which is a seed borne pathogen. For more data please see: <http://cropwatch.unl.edu/web/varietytest/wheat> and <http://cropwatch.unl.edu/web/wheat/virtual>.

The generous support of the Nebraska Wheat Board is gratefully acknowledged.

History of dryland cropping systems research at HPAL

The following article was written for the Centennial Celebration of the University of Nebraska-Lincoln Panhandle Research & Extension Center, which will be celebrated at the Center in Scottsbluff on July 24, 2010. This year is also the 40th anniversary of the High Plains Ag Lab. We will be celebrating this milestone on June 17, at the High Plains Ag Lab. I hope you enjoy this brief history of the High Plains Ag Lab, and that you will help us celebrate 40 years on June 17.

On April 7, 1967, the U.S. Government made available to the University of Nebraska 2,410 acres of land, which had been part of the Sioux Army Ordnance Depot, for agricultural research and educational purposes. The work of the Cheyenne County Rural Area Development (RAD) Committee, largely through its crops committee, was instrumental in getting the Laboratory established. The officers of this crops committee were: Ralph Spearow, president; Ray Cruise, vice president; and Harold Tremain, secretary.

The need for the field laboratory was underscored in 1964 when there was a severe outbreak of black stem rust, wheat streak mosaic, and crown and root rot of wheat in the Panhandle of Nebraska. In the same year it was announced that the Department of Defense was phasing out the Sioux Army Ordnance Depot. The RAD Committee immediately explored the possibility of utilizing some of the land and facilities for an "experiment station".

After extended negotiations, the Government issued an interim use permit for the University to initiate operations (the deed was issued August 1970). On April 17, 1967, Ray Cruise and Colonel Williams drew a symbolic furrow (Fig. 1) on what had now been named the High Plains Agricultural Laboratory (HPAL). Thus, after much effort, time, and travel expenses by the members, RAD had succeeded in getting the Laboratory established.



The symbolic first furrow is plowed at High Plains Ag Lab in 1967, by U.S. Army Col. C. Williams and Ray Cruise of the Cheyenne County Rural Area Development Committee.

When the RAD Committee was terminated on July 1, 1971, Director John L. Weihsing of the Panhandle Station prevailed upon the members to become the advisory group for the HPAL. The HPAL Advisory Board continues to provide valuable input and support to the HPAL.

Under the guidance of Charles Fenster, a research program was initiated immediately upon the University's obtaining possession of the Sioux Army Depot property. The emphasis of his program was on the efficient use of soil and water and optimizing crop yields under the semiarid conditions prevailing in the High Plains. This has remained the focus of the dryland cropping systems effort. The research program has grown in extent and depth since its inception, and today is recognized internationally for its many and continuing accomplishments.

Charles Fenster was hired by the university in 1956 and appointed to a newly created position to study the total management system for winter wheat production (Fig. 2). He began his university career at the Northwest Agricultural Laboratory near Alliance. His

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History of research at HPAL, continued

Continued from previous page

headquarters were moved to the Panhandle Station near Scottsbluff in 1967.

Fenster was known internationally for his work with stubble-mulch and no-till conservation tillage systems. He and Dr. Gary Peterson, soil scientist in Lincoln, established the Long-Term Tillage plots in 1969 at the HPAL. These plots compare various tillage regimes (moldboard plow, stubble-mulch, and chemical) during the fallow portion of a winter wheat-fallow rotation on winter wheat production and soil quality. More than forty years later, these plots continue to result in new knowledge about the effects of fallow tillage on soil quality.

Fenster also worked with colleagues in weed science on some of the first chemical fallow work with atrazine, paraquat, and glyphosate. Professor Fenster retired in 1982 after a distinguished career at the Panhandle Station.

Over the next eight years, three individuals lead the dryland cropping systems program in the Panhandle. They were Dr. Mark Hooker (1983), Dr. John Havlin (1984-1985), and Dr. Duane Martin (1986-1988).

In 1990, Dr. Drew Lyon was hired to lead this program. Dr. Lyon emphasized cropping system intensification and diversification to reduce the frequency of summer fallow, increase precipitation use efficiency, reduce the risk of soil erosion, and break weed, disease, and insect pest cycles of winter wheat.

Dr. Lyon was named the first Fenster Distinguished Professor of Dryland Agriculture in 2008. This professorship was the first at the University of Nebraska-Lincoln established for faculty not located on the main campus in Lincoln. The professorship was established with a \$250,000 gift to the University of Nebras-



UNL wheat specialist Charles Fenster was the first faculty supervisor at the High Plains Ag Lab, a position he held for many years.

ka Foundation from Charles and Eunice Fenster.

Dr. Lyon worked closely with Dr. David Baltensperger through 2006 when he left to become a Department Head at Texas A&M University, and then subsequently with Dr. Dipak Santra, both of whom served in the role of Alternative Crops Breeding Specialist, to identify promising crops that could be profitably incorporated into dryland crop rotations. Proso millet, sunflower, and corn are now grown as an integral part of the crop rotation on a significant number of dryland acres that previously produced only wheat in a winter wheat-fallow rotation.

Wheat stem sawfly could be overlooked problem in Nebraska wheat

By Jeff Bradshaw, *Extension Entomologist*
UNL Panhandle Research and Extension Center

The wheat stem sawfly, *Cephus cinctus*, feeds as larvae in the stems of wheat and numerous other grass species. This insect is known to attack native grasses as well as exotic grasses such as smooth brome grass, timothy, and quackgrass. In recent years, this sawfly has become a common pest of wheat in western North America and has cost U.S. wheat growers millions of dollars in the western growing region. The wheat stem sawfly used to be an exclusive pest of spring wheat; however, in recent years its seasonality has shifted to allow it to attack winter wheat as well. Almost no spring wheat is grown in Nebraska; therefore, it hasn't been until the 1990's that this insect has posed a threat to wheat production in western Nebraska. Although some hard-stemmed varieties of wheat are resistant to attack from this insect, these same varieties typically have less desirable agronomic traits.



Wheat stem sawfly damage from larval stem cutting. (Photo: W. Morrill, MSU)

Importantly, it isn't just the change in the insect's biology that has contributed to its damaging presence in winter wheat. Farming practices in some regions, such as, conservation tillage and continuous cropping of wheat have also contributed to outbreaks of this insect. Finally, droughty weather can also encourage large populations of this insect. All of these factors add up to my concern regarding damage to wheat in Nebraska. Karen DeBoer and Bill Booker, UNL Extension Educators, have found evidence of dam-



Adult wheat stem sawflies. (Photo: J. Kalisch, Department of Entomology, University of Nebraska-Lincoln.)

age in wheat in Banner, Box Butte, and Scotts Bluff Counties.

Damage has been estimated as much as 20% in some fields in the Panhandle. The damage is most distinct at the end of the growing season, once the larvae, feeding in the stem, cut the stem and cause the wheat to lodge. The larvae then overwinter and pupate in the remaining stubble.

I started working as an entomologist at the Panhandle Research and Extension Center (PREC) this January and I would like to understand the status of this pest for Nebraska. So, this year I am planning to conduct an initial survey of this pest in western Nebraska. If you are a grower who feels that they have suffered yield loss due to this pest, please call the PREC or email me at: jbradshaw2@unl.edu.