

# News from the High Plains Ag Lab

October 2011

On the web: [panhandle.unl.edu/hpal](http://panhandle.unl.edu/hpal)

UNIVERSITY OF  
**Nebraska**  
Lincoln

## Advisory Board Chairman's Comments:



The August field day went well. Some of the topics covered were forage production following irrigated wheat, variety trials and the integrated livestock and crop research.

Virgil Schumacher announced the establishment of a fund to keep the millet breeding program alive. This is our chance to step forward and support research that directly benefits us. Anyone who didn't receive the mailing can contact Crossroads Coop for the details. A subject for future discussion is the development of a check off for supporting millet research and market development.

The winter advisory board meeting has been set for February 7. It's early, but if you have suggestions for topics to cover, pass them along. The campaign for funding of a new building is still on going.

*Alton Lerwick*

## High Plains Ag Lab Farm Manager's Comments:



Even though I thought the summer from hell would never end, October is here already, along with all the projects that need to be done before snow starts to blow. Wheat harvest was finished shortly after our last letter, and was about what I expected with some of the poor emergence last fall and some nasty hail in June. Some of our wheat averaged over 40 bushels per acre, but some only did around 20 bushels per acre. All in all, I couldn't complain too much.

Another hail in early August took some of our millet completely, along with beating up the corn, sunflowers and the other fields of millet. The millet has been harvested at

this time, and yielded 18 bushels per acre on the low end to 29 bushels on the high end. Corn and sunflowers need some more drying time, but hope to be in the flowers in the next week or so.

Wheat seeding went much smoother this year than last. We were beginning to be a little shy of moisture at the start of seeding, but some very timely and gentle rains set us up just right, and the new wheat looks like it's off to an excellent start. The moisture that we had this past weekend was perfect to take us into late fall and winter. Even the grasshoppers have not turned out to be the problem that we thought they would be. We have to have some good luck occasionally.

Here's hoping that you all have an abundant and safe fall harvest, and that mother nature will co-operate so that everything runs smoothly until you are finished for the year. Don't forget that our annual meeting will be coming up on February 7, and we would like to see you all there. Further information will be sent to you later in the year.

*Tom Nightingale*



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# Integrated crop and livestock research

By **Karla Jenkins**

**Cow-Calf/Range Management Specialist**

Integrated crops and livestock research is under way at the High Plains Ag Lab.

In the summer of 2010 combinations of legumes, grasses, and brassicas were compared to field peas, field peas and oats, and triticale to determine the amount of forage produced as well as the nutrient quality for grazing beef cattle. The plots were planted in April and then clipped for forage analysis twice in June and again in early July. The plots were then sprayed to kill subsequent growth prior to seeding wheat in the fall.

The forage combinations containing forage peas and oats provided the most biomass at each clipping. Digestibility of all the forage combinations was over 80 percent in early June. By July the combinations with winter triticale still maintained a digestibility of 71-73 percent, but those containing oats dropped to 59-65 percent. This lower digestibility is expected with higher forage production.

The results of this initial study suggest these forage crop combinations would be an acceptable alternative to grazing native range early in the grazing season.

In April 2011, forage peas, oats, and turnips were planted and the field fenced into three replicated paddocks. In June yearling steers began grazing the forage combination. Replicated crested wheatgrass paddocks were also grazed for a control treatment.

Samples were collected to determine the forage availability, an estimate of forage intake, and diet quality for the animals. Forage samples were clipped for diet quality and esophageally fistulated cows sampled the pastures so a comparison of the quality available and the quality selected may be determined.



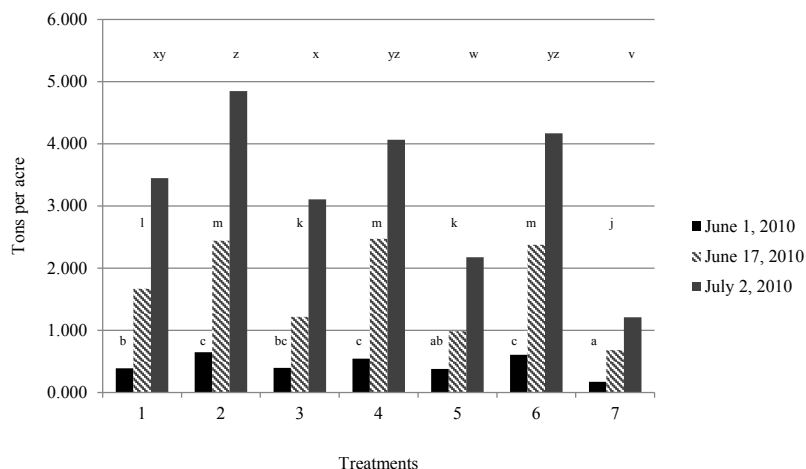
*Cattle graze on cover crops at High Plains Ag Lab.*

**Digestibility and protein of forage crop mixtures during 3 sampling dates in 2010.<sup>1</sup>**

	June 1		June 17		July 2	
	IVDMD <sup>2</sup> , %	CP,%	IVDMD, %	CP,%	IVDMD,%	CP,%
Treatment 1 <sup>3</sup>	84.4	25.3	74.3	20	72.7	17.1
Treatment 2	82.5	25.8	78.1	17.2	65.2	8.1
Treatment 3	80.4	27.3	77.3	20.5	71.7	14.6
Treatment 4	82.5	25	77.1	13.2	59.8	7.7
Treatment 5	80.6	29	76.4	19.6	71.1	13.7
Treatment 6	83.4	25.1	78.8	14.6	59.0	7.5
Treatment 7	81.8	29.9	78.2	22.1	73.4	12.8

<sup>1</sup>Values reported on a 100% dry matter basis <sup>2</sup>IVDMD=in vitro dry matter digestibility

<sup>3</sup>Treatment definition: 1 = forage peas, 2= forage peas, oats, 3=forage peas, winter triticale, traditional brassica mix, 4=forage peas, oats, traditional brassica mix, 5=forage peas, winter triticale, grazing brassica mix, 6= forage peas, oats, grazing brassica mix, 7= winter triticale



**Forage Production of No-till Forage Crops for Grazing Cattle Treatments the same as Table.**

# Wheat following cover crops studied

By **Drew Lyon**

**Extension Dryland Cropping Systems Specialist**

In the October 2010 issue of the High Plains Ag Lab (HPAL) Newsletter, Karla Jenkins and I presented the initial results of an annual forage/cover crop study conducted at the HPAL in the summer of 2010. Eight different cover crop or cover crop mixes (cocktails) were grown and clipped at intervals to determine composition, biomass, and nutritional quality. Plots were 15 feet wide by 30 feet long. On June 1, 2010, a swath 7.5 feet wide and 30 feet long was sprayed with glyphosate through each plot to kill the cover crop. The other half of each plot was sprayed with glyphosate on July 2, 2010.

In September 2010, just prior to winter wheat seeding, gravimetric soil water to a depth of four feet was measured in each of four treatments. We did not sample from the four treatments containing triticale. We were given winter triticale seed instead of spring triticale seed and it did not vernalize and form heads. We found no differences in soil water at wheat seeding time between the different forages and forage mixtures. We did find that there was on average 1/2 inch more soil water where the cover crop had been sprayed with glyphosate on June 1, compared to where the cover crop had not been sprayed until July 2.

Winter wheat was seeded into these plots on September 10, 2010, with a John Deere 1560 no-till drill with a single disk opener. Dry soil conditions at seeding resulted in a poor wheat stand that fall. However, with some late October precipitation, and a little precipitation over the winter, wheat stands started to improve in the spring. By mid-spring, it was becoming obvious that the stands were a little thicker, and plants a little further along in development, where the

previous year's cover crop had not been sprayed until July. Even though there had been more total soil water at wheat seeding where the cover crop had been sprayed on June 1, this extra water was obviously not in the seed zone. The cover crop that had been killed later had used more soil water, but the extra crop residue was able to retain more water in the soil seed zone and increase wheat germination and establishment.

Harvest results confirmed that winter wheat seeded into the heavier cover crop residues yielded better than the wheat seeded into the lower residue situation, even though there was more soil water at seeding in the latter situation (See table). Care should be taken when interpreting these results. They are from only a single year and that year was quite unique. We had an extremely dry late summer and early fall, which resulted in very dry surface soil conditions at the time of wheat seeding. This was followed by a cool, wet late spring and early summer, which negated some of the benefits that extra stored soil water at planting typically provides. It does highlight the role of maintaining crop residues to slow evaporation from the soil surface and help retain soil water in the seed zone.

In addition to increased grain yield, wheat seeded into the heavier crop residues also had greater grain test weight and lower grain moisture than wheat seeded into lesser crop residues. This suggests that the wheat seeded into the heavier residue was further along in development by the end of the growing season, the likely result of earlier germination.

I anticipate designing a new study to begin in the spring of 2012 to look more closely at cover crop termination timing on the performance of the subsequent winter wheat crop. I will use what we learned from the 2010-2011 study to help me design this new study.

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## Winter wheat grain yield, test weight, and moisture following various cover crops terminated either June 1 or July 2, 2010.

Termination date	Grain yield	Test weight	Moisture
	bu/ac	lb/bu	%
June 1	35.9	57.0	12.0
July 2	40.7	59.5	11.1
Probability of a difference	98.7%	> 99%	> 99%

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# Results of wheat stem sawfly survey analyzed

By Jeff Bradshaw, Extension Entomologist, and Susan Harvey, Agricultural Technician

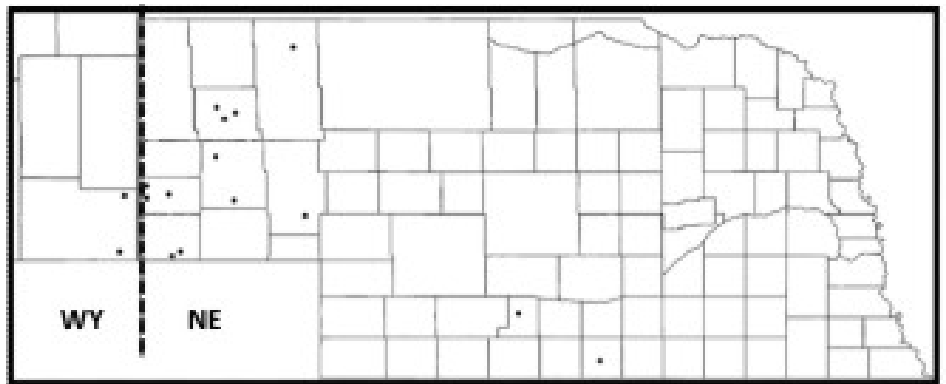
This year, as part of a USDA-funded project (iWheat – [www.iwheat.org](http://www.iwheat.org)), we began a large, multi-state study to try to understand multiple facets of managing winter wheat production from the standpoint of weeds, diseases, and insects. For part of Nebraska's portion of this work, one of the key pests we are trying to understand is the wheat stem sawfly (WSS). For this effort, we have surveyed locations across Nebraska's wheat production region.

To accomplish a survey over a large area, we solicited for collaboration from crop consultants and Extension Educators throughout western Nebraska to collect wheat samples. We had a great response, and even some producers jumped on board with sampling. The protocol asked that collaborators identify as many production fields as they felt they had the time and energy to survey.

Thirty-one fields, 22 growers, Extension educators and crop consultants were involved in this project which extended geographically from eastern Wyoming throughout the western half of Nebraska (see map). Large tubes were distributed to each cooperator for the collection of wheat samples (postage was included for their return), along with data and field information sheets and materials for subsequent post-harvest stem counts.

Currently there are 31 emergence traps (mailing tubes) in the Entomology lab at the Panhandle Center. They will be evaluated for sawfly numbers and for the presence of WSS parasitoids as they (hopefully) emerge over the winter. Stem count data continue to be collected as harvest is nearing completion. Numerous parasitoid wasps are emerging from the samples. These parasitoids are likely aphid parasitoids. We likely will need to wait a bit longer before any sawflies and their parasitoids begin to emerge.

Additionally, wheat stem sawfly sticky traps were posted along the east edge of two participating no-till fields



**Top:** Adult wheat stem sawfly (photo credit: J. Kalisch).

**Above:** Approximate locations of sawfly survey fields in Nebraska and two locations in Laramie County, Wyo.

on May 24, and collected on June 16. We placed five traps per field in two no-till wheat fields according to Dr. Dave Weaver's (Montana State University entomologist) protocol. The traps were set out with 3 pheromone traps and 2 sham traps (the pheromone is synthesized in Dr. Weaver's laboratory).

Sawfly numbers were low overall in these particular areas this year. However, one location did not yield any sawflies. The other location collected no sawflies in sham traps, and one sawfly each in two pheromone traps and two sawflies in a third pheromone trap. I did get word of another location that had very high numbers, but did not get word until after these traps were set. The presence of large numbers of flies on these traps (both pheromone and control), made them difficult to evaluate. Windy conditions also contributed to a significant amount of dirt on some of the traps.

# Alternative Crops Research at HPAL: Fall 2011 Update

By **Dipak K. Santra and Vernon Florke**  
Alternative Crops Breeding Program

## Hail storm in 2011:

All trials at High Plains Ag Lab were significantly damaged by hail storms in 2011, which resulted in poor performance.

## Wheat and Triticale

Winter wheat variety trial 2011 result: In 2011, the hail storm impacted results of dryland wheat varieties tested under both conventional and organic production systems at HPAL. Two new lines (CO050303-2 and SY Wolf) ranked No. 1 and No. 2 with respect to grain yield at HPAL (Table 1, this page). The CO050303-2 remained No. 1 and SY Wolf was No. 3 when average yields of all trials throughout Panhandle District were considered. The 2011 season was the first year of testing for these two lines. Therefore, this might not be the case next couple of years. However, this is something to watch in the future. Under organic production system, one experimental line SD05118-1 (from South Dakota) ranked No. 1 in yield but it was not significantly higher than common varieties (Table 2, next page).

## Winter wheat variety trial 2012 update:

For 2012 wheat variety testing, 47 varieties under conventional and 34 varieties under organic system were planted. We have been testing early generation breeding lines under organic systems during the last four years, which ended in July 2011. Therefore, this year there are no breeding nurseries planted under organic system and we have planted only the variety trial.

Similar to last year, 12 lines of forage triticale were planted at HPAL for 2012 season.

Table 1: Dryland Winter Wheat Variety Test (conventional) – 2011 at HPAL

Variety	Grain Yield (bu/a)	Bushel Weight (lb/bu)	Yield rank
CO050303-2	70	62	1
SY Wolf	67	61	2
NE03490	67	58	3
Settler CL	66	61	4
Arrowsmith (W)	66	60	5
CO06424	63	57	6
Tam 111	62	61	7
Armour	62	58	8
Hawken	62	59	9
Winterhawk	61	62	10
NE06545	61	60	11
Snowmass (W)	61	60	12
Bill Brown	60	60	13
NI08708	60	60	14
Hatcher	59	60	15
Smoky Hill	58	61	16
WB-Stout	58	54	17
Wesley	58	60	18
Infinity CL	56	60	19
McGill	56	59	20
Mace	56	60	21
NE05496	56	59	22
Bond CL	56	57	23
CO06052	55	59	24
Robidoux	55	61	25
Antelope (W)	55	61	26
Hitch	55	60	27
Thunder CL	54	60	28
NE06607	53	60	29
NW03666 (W)	53	60	30
NE05548	53	59	31
Millennium	52	59	32
Expedition	52	61	33
Overland	51	61	34
NE02558	51	61	35
NE05426	50	61	36
NE07531	50	61	37
Lyman	49	61	38
Alliance	49	61	39
Aspen (W)	49	57	40
Goodstreak	45	61	41
NX04Y2107	45	61	42
Camelot	44	61	43

Continued on next page

# Alternative crop research, continued

Continued from previous page

## Spring and summer crops

**Camelina:** (Nicknamed “Jet Fuel”): The camelina trial was lost due to hail damage.

**Fenugreek (Human health enhancing legume), also known as “Greek hay:”** The trial was lost due to hail damage.

**Safflower planting date study:** The trial was harvested Sept. 30, and results are not ready to be posted.

**Pea:** Similar to all the trials at HPAL, this trial was also severely affected by hail in 2011. The average yields of the 10 varieties tested were less than 50 percent of the anticipated yield of spring pea in the High Plains (Table 3, this page). However, differential yield potentials of the genetically different varieties have been manifested (which is normally expected in variety trials). This indicates that there is a possibility of selecting high grain yielding varieties through this variety testing. We will continue this trial.

**Proso millet (Bird seed crop):** The proso millet trials don’t look good compared to the past 2-3 years, primarily due to hail damage. We expect to harvest by mid-October.

**Sunflower (edible oil but can be used as biodiesel):** All the sunflower trials look worse than in the past. This is primarily due to hail damage. We anticipate to harvest towards end of this month.

**Tef (Gluten-FREE, high Fe and Ca content cereal.** Also nicknamed “Lost Crop of Africa”): This trial was partially affected by hail and pigweed infestation since there is no registered herbicide for tef.

Table 2. Organic Wheat Variety Test – 2011 at HPAL

Variety	Grain Yield (bu/a)	Bushel Weight (lb/bu)	Grain Protein (%)	Yield rank
SD05118-1	63	60	11.8	1
Overland	61	58	13.5	2
Hatcher	58	59	11.8	3
NE05496	58	58	12.0	4
Millennium	57	58	13.3	5
NE03490	57	58	12.9	6
NW03681 (W)	56	60	12.4	7
McGill	55	58	13.0	8
NE08457	55	60	14.0	9
NE06469	55	58	12.6	10
Alliance	54	59	13.5	11
NW07505 (W)	52	60	11.5	12
NI08708	52	58	12.7	13
Danby (W)	51	59	12.8	14
Camelot	49	59	14.3	15
Wahoo	49	58	12.9	16
Snowmass (W)	49	59	12.7	17
Karl 92	49	58	15.2	18
NW03666 (W)	48	58	13.6	19
Arrowsmith (W)	48	59	13.3	20
Wesley	46	58	13.3	21
Expedition	46	60	14.0	22
NE06607	46	59	12.8	23
NE05548	46	59	13.6	24
Antelope (W)	45	57	13.7	25
NE04424	45	58	12.9	26
NE07569	45	59	12.8	27
Darrell	44	59	13.8	28
NE99495	44	58	13.2	29
Goodstreak	44	59	14.2	30
Pronghorn	43	58	14.6	31
Buckskin	43	60	14.1	32
Alice (W)	38	58	13.6	33
Clarkscream (W)	12	58	ND	34
<b>Trial Mean</b>	<b>49</b>	<b>59</b>	<b>13.2</b>	
<b>LSD (0.05)</b>	<b>14</b>	<b>NS</b>	<b>1.4</b>	

NS = None Significant

Table 3. Spring Pea (Grain) Variety Test 2011 at HPAL

Variety	Grain Yld (lbs/a)	Moisture (%)	Test Wt (lbs/bu)
Majoret	461	11	56
PS08ND0114	459	11	55
Cruiser	459	11	56
PS05ND0232	457	11	55
CDC Golden	452	11	55
PS08ND0111	452	11	56
DS Admiral	448	11	56
CDC Striker	447	11	55
PS07ND0190	446	11	56
Agassiz	445	11	55
<b>Trial Mean</b>	<b>453</b>	<b>11</b>	<b>56</b>
<b>LSD (0.05)</b>	<b>6</b>	<b>NS</b>	<b>NS</b>

NS = None Significant

## Update on HPAL Building Project

Events that take place on the football field or the volleyball court are not the only ways that universities gain or build reputations. The High Plains Ag Lab has built a University of Nebraska reputation based on research for the future. The University Foundation and members of the Building Committee have been working towards the goal of the new research lab. Your help is needed in looking at what you might offer towards this project as well directing us to other interested supporters. Please consider your options and help lead us towards others as the drive moves forward.

*Keith Rexroth, Chairman*