UNIVERSITY OF MINNESOTA

The Northwest Experiment Station **News**

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Jacobson Visits Russia

by Marlyn Jacobson
Assistant Scientist

Privolnoye is a large "joint-stock farm" north of Krasnador, which is in the southern part of Russia. The north border of the farm is on the Azov Sea. "Joint-stock" means the Russian workers bought the former "collective farm" from the government. The land is very flat and the soil is very fertile; so fertile, that during the German occupation, train loads of soil were shipped to Germany from farms in the Krasnador area. The farm is 36,000 acres and has lakes, rivers, marshlands, and tree-row shelterbelts making much land unsuitable for crops.

Dr. Bill Fenster, Director of University of Minnesota Foreign Affairs and Dr. Larry Smith, Northwest Experiment Station Head, arranged for me to go to Privolnoye to teach Russian workers how to operate a new milking parlor and use USA dairy technology to increase milk production and milk profits. The average milk production for the herd has been about 3,800 lbs of milk per cow per year. I was to work as a consultant to Bret Barry, owner and manager of Fertilis International, a company bringing USA dairy genetics to Russian farmers and the American in charge of the dairy development program for Privolnoye Farm.

The farm has about 1,000 head of milking cows at three different locations. The males are raised as dairy beef and kept as bulls until slaughter. They also raise horses for breeding and a large number of geese.

Crops raised on the farm include sugarbeets, corn, popcorn, potatoes, winter wheat, winter barley and alfalfa. It is interesting to note that the field corn is open pollinated and yields about 120 bu per acre in an average year. The potatoes are Russian varieties and USA potato project varieties. All row crops are cultivated using hand labor weeding in the rows. The farm also had onions, cabbage, tomatoes, and muskmelons for the workers. The popcorn is also a USA project for the farm.

There were seven Americans working on the farms as advisors to the Russian workers. We had six interpreters to help communicate the new technology in potato, popcorn and dairy farming. Improvements went slowly as we waited for new equipment and other supplies to clear Customs. Many of the government agencies have not accepted the new reforms and the fast changes in the economy due to the change in Democracy and Capitalism.

I was on the farm for two months - May 15th to July 15th. We were able to make some improvements, but were not able to teach the use of the new milking parlor. The parlor is now scheduled to be completed in October. The parlor is being built by russian contractors and Alfa-Lavel from Sweden. Four Russian workers were brought to the University of Minnesota for training and the University is now part of the "team" providing American technology to Russia.

I enjoyed the experience and challenge of teaching our modern dairy techniques to the Russian workers. The use of interpreters to communicate my ideas and waiting for things to happen takes a lot of patience. As the dairy manager, Michael Lubus, stated: "You give us a new way to do things - one, two weeks, we get it done."

Each Russian family is assigned 1.5 hectares of sugarbeets for hand weeding.

Smith's Comments

The Station's farm foreman, Dale Kopecky, informed me that as of today, the fall field work was complete. I rather suspect that this announcement is related to the opening of deer season, as both Rob Heggie and Jim Boutain, farm equipment operators, are taking next week off to hunt. with the wet muddy conditions experienced this late summer and fall, the Station's farm crew and volunteers from the other departments on the Station that pitched in to get the crops off, straw baled and fields worked for next year, they deserve a break. After six years of drought conditions, it was a new experience working in the mud again. For a while in June and July it appeared that we would lose the majority of our crop research plots to excess water. The staff working in these areas spent countless hours pumping off water and coming up with new ideas for saving the plots. Very little research data was lost, thanks to their efforts. Having people of this caliber sure makes the "boss" look good.

Crop production on the Station was a mixed bag this year. The wheat crop suffered from scab for the second year in a row. Yields were the second lowest in the 24 crop seasons I have been at Crookston. Coupled with the low yields was poor quality. On the bright side, the Station harvested the largest sugarbeet crop in its history, despite large areas of drown-out in several fields. Barley yields were above average, but suffered from the quality standpoint. Corn yields were average and alfalfa was above average in yield and quality. Overall not too bad a year.

In the last issue of the *Northwest News* I reported that the Station was recruiting for a small grain specialist. Through the collective efforts of the Minnesota Wheat Research and Promotion Council.; Minnesota Barley Growers Assn.; College of Agriculture; Minnesota Extension Service; Minnesota Agricultural Experiment Station and the Northwest Experiment Station, funding has been secured for two positions rather than the one previously announced. One position will focus on small grain extension and outreach; the other on research residue related to management for profitable small grain production. If all goes well, both positions should be filled in January, 1995.

Best wishes for a happy holiday season and healthy and prosperous new year.

Larry Smith presented a picture of the Station to Rita Kuznia at her farewell party. Rita worked in plant pathology and resigned to accept a position with Northrup King.

Carol Windels Receives Service Award

Carol Windels was awarded the North Central Division's Distinguished Service Award at its annual meeting held in Albuquerque, NM, in August 1994. Carol has served the Division as its secretary-treasurer (1987-1990). Other activities include Councilor-at-Large on the APS Council for 3 years, associate editor for 3 different journals, member or chair of at least 5 APS committees, as well as service to the International Society of Plant Pathology. These and other professional activities merited strong consideration for this award.

Carol has honored the Division and the Northwest Experiment Station by her activities in plant pathology.

Congratulations, Carol!

The Weather -

The weather - everyone talks about it - most don't agree with it, everyone wants to change it!

The weather in 1994 has been an interesting mixture. In weather data collected at the Northwest Experiment Station by Jim Cameron, senior research plot technician and weather observer, the first killing frost did not occur until October 30, when the temperature dropped to 19°F. The first 20 days in October were extremely wet and the next 20 days had above average temperatures.

Yes, there was definitely more moisture in 1994. Precipitation figures show that more moisture was received in every month in 1994 except January and August. The highest amounts of precipitation were June with 7.11"; July with 5.73"; October - 2.77" and September - 2.72". Total precipitation received from January 1 to October 31 totals 24.99 inches.

27th Annual
BEEF CATTLE DAY

Northwest Experiment Station
University of Minnesota
Crookston, Minnesota

Monday, December 12, 1994

Harvey Windels - Animal Scientist, Northwest Experiment Station, Crookston
Alfredo DiCostanzo - Ext. An. Sci., Beef Cattle Nutrition & Management, U of M, St. Paul
Brent Woodward - Ext. An. Sci., Beef Cattle Production Systems, U of M, St. Paul
Ron Eustice - Minnesota Beef Council, Minneapolis
Cindy Schweitzer - Beef Industry Council, Chicago, Illinois
Tom Scott - Meat Export Federation, Denver, Colorado
Brian Buhr - Livestock Marketing Specialist, U of M, St. Paul
Hugh Chester-Jones - Animal Scientist, Southern Experiment Station, Waseca

9:30 a.m.	**Registration & Coffee** - Ag Research Center Auditorium Registration Fee - $15.00 (includes lunch, beef booklet & other program costs)
10:00	**Effect of Vomitoxin on the Performance of Beef Steers** Harvey Windels
10:30	**Strategies for Reducing Feed Cost of Gain** Alfredo DiCostanzo
11:00	**Carcass Quality and Target Markets** Brent Woodward
11:30	**Use of Industry Indicators to Aid in Making Marketing Decisions** Brian Buhr
11:50	**MN Beef Council Presentation** Ron Eustice
12:15 p.m.	*Lunch - Conference Center*
1:15	**Eating in America Today (EATII Study)** Dr. Cindy Schweitzer
2:00	**What is the Meat Export Federation? Are Beef Exports Making a Difference?** Tom Scott
2:45	****Breakout Sessions**** **Application of Industry Indicators to Make Marketing Decisions** - Brian Buhr **Strategies for Feeding Holstein Steers** - Hugh Chester-Jones Breakout sessions are scheduled to permit further in-depth discussion on topics listed. Producers have a choice of Holstein feeding or use of indicators to make marketing decisions.
3:00	**Adjourn** - Coffee and/or view cattle facilities and cattle on trial.

Sponsored by:
Northwest Experiment Station, Animal Science Department, MN Extension Service
University of Minnesota

High Moisture Grain Research Results in Popular Feeds

by George D. Marx

A number of high-moisture grain feeding trials have been conducted at the Northwest Experiment Station. The research began over 30 years ago with a study on the handling, harvesting, storing, and feeding of high-moisture barley. This was the first study of its kind ever conducted in the United States and has prompted many inquiries on its utilization as a feed component in livestock rations. This year, the wet harvest conditions have sparked a renewed interest in feeding barley as a high-moisture grain to dairy cattle as well as other farm animals.

The many studies on the growing, harvesting, handling, storing and feeding of high-moisture grains including corn, barley, wheat and oats has proven that this method of grin utilization is a viable and successful alternative for some producers. The most popular high-moisture grain for dairy herds, including the Northwest Experiment Station herd, has been the use of high-moisture corn as a major grain and many times the exclusive grain in dairy rations. In Minnesota, over one-third of the dairymen on DHIA utilize high-moisture corn in lactating dairy cow rations and the use is increasing.

There has been, however, a renewed interest in utilizing barley as high-moisture grain in the ration. Through extensive studies at Crookston on barley as a feed grain for dairy animals from baby calves to mature milking animals, feeding and management recommendations have been formulated for its use as a high-moisture grain. In many respects the utilization of high-moisture barley is similar to that of high-moisture corn.

Moisture content of high-moisture grains at harvest is critical for proper storage and fermentation. The range is from 22 to 35% moisture with an optimum of 25 to 32%. In hot, dry weather, barley kernel moisture changes very rapidly when it reaches 35% so the window of ideal harvest is very short. However, during wet weather and poor drying conditions, the change in kernel moisture is much slower. High-moisture barley can be harvested as standing grain or in a swath. Some dairymen have salvaged wet barley when potential sprouting is a problem in windrows that does not want to dry after continuous rains. If the moisture falls below the range for proper fermentation, water can be added to bring it within the optimum range for ensiling. Addition of organic acids is also a method of storing high-moisture grain without ensiling. Be sure to follow the directions on the label as to amount of acid to apply according to moisture content and anticipated length of storage.

Barley should be gradually introduced to the ration of the dairy cow over a one- or two-week period to a top level of 15 to 20 lbs maximum per cow per day. Allow two to three weeks for the material to ferment before first feeding. Fresh high-moisture barley may cause digestive upsets if fed too soon after storage. The balance of the grain mix should come from another source such as corn. A ration of 50% high-moisture barley and 50% high-moisture or dry corn is ideal. Too much barley fed at once may cause rapid accumulation of acids in the rumen and could cause rumen acidosis or off-feed problems. Barley digests very rapidly similar to wheat, so care must be taken in feeding these grains. High-moisture barley should be rolled or coarse ground when fed to lactating cows to prevent small kernels from passing through the gastrointestinal tract undigested. A flat rolled barley kernel that looks like oatmeal is ideal. For best results, the rolls on the mill should have 10 to 12 grooves per inch or if using smooth rolls, be sure to have scrapers installed to keep the rolls clean, otherwise a gum layer may build up and become a problem.

The energy value of high-moisture barley is about five percent less than corn, but the protein content is 40% higher and once can save on protein supplement in the ration when feeding barley. The protein in barley is lower (about half) in "bypass" or undegraded intake protein than corn and should be considered in balancing rations for very high producing cows to ensure sufficient bypass protein in the ration.

High-moisture grain has many advantages over dry grain which include less field losses and saves the shall and light kernels with less shattering loss, earlier harvest with less potential lodging, fewer weather risks and the economics of not having to artificially dry the grain which is the case with a lot of corn in this area. The material is less dusty when fed and works especially well in a total mixed ration. Ensiled high-moisture grain is fermented which produces a very palatable and acceptable feed for livestock which maximizes dry matter intake and potential milk production. These advantages are the cause for its increasing popularity and use in dairy rations throughout the country.

Russians buying fermented milk in marketplace.

Horticulture Project Completes Another Season

By Todd Cymbaluk

Another year has been completed for the horticulture department and again the weather played a major role in production. Precipitation has been up and temperatures have been down creating a difficult year for some crops.

The 1994 field trials consisted of broccoli, cabbage, carrots, cauliflower, cucumbers, muskmelon, onions, peas, peppers, pumpkins, red beets, snap beans, squash, sweet corn, and watermelons. The red beets, carrots, direct seed onions, and some of the sweet corn trials were lost due to ground crusting or standing water.

Even with some crop loss, we had a busy year. I would like to thank the horticulture crew - Dennis Tollerud and Sara Larson, for doing an exceptional job.

The first planting date of the broccoli yielded well except part of the trial was lost due to standing water. The second planting date of broccoli started out very well, but with temperature fluctuations, the broccoli heads dropped in quality at the end of the season.

The cauliflower transplants had a terrific crop with beautiful large white heads. The foliage growth was so great that the heads were covered more than enough and no tieing of the leaves was needed. The direct seeded cauliflower was small, but still had good yields.

This year has been one of the best years we have had for cabbage. Production started early and continued until the first hard frost. The yields and quality of the cabbage were up tremendously and kept the horticulture crew very busy.

The sweet corn had average yields, some of the sh2 varieties were lost due to standing water. The snap beans yielded well even though the plant size was small.

Cucumbers struggled with poor plant growth and had average yields. The pepper trial started early in the year and lasted late into the fall with very good yields and quality. The onion transplant trial had a terrific start, but the tops fell over in early August limiting bulb size. Due to a late frost, the muskmelons, watermelons, and pumpkins did very well.

If you are interested in the results from these trials, please contact me at 218-281-8623.

From the Staff of the Northwest Experiment Station

Progress Report on Vomitoxin Trials With Bred Ewes

by Harvey Windels

The 1993 and 1994 harvest of barley and wheat in northwest Minnesota and eastern North Dakota was troubled with head blight, commonly known as scab which is caused by the fungus *Fusarium sp.*. This fungus can produce deoxynivalenol (DON), a mycotoxin commonly called vomitoxin which has been reported to cause reduced feed intake and performance in livestock, particularly swine. Vomitoxin was present at various levels in much of the barley and wheat in the Valley, mostly in the 1-10 ppm range, but some as high as 25-30 ppm. Little research has been done or reported on the effects of vomitoxin in ruminant animals, particularly at levels over 6 ppm of the diet dry matter. Probably the most extensive research to date on the effects of vomitoxin on ruminants was done with feedlot cattle this past year at three northern area research stations, namely, Crookston, MN (Northwest Experiment Station), Carrington, ND (NDSU) and Morris, MN (West Central Experiment Station). The three research groups fed barley with vomitoxin levels of 22 to 30 ppm and diets with vomitoxin levels as high as 15-21 ppm on a dry matter basis. All three groups found that feedlot cattle on growing and finishing diets tolerated these levels with no health problems and no decrease in feed intake or performance.

A question asked many times this past year was what effect does vomitoxin have on pregnancy of cattle and sheep. There is essentially no information available to answer this question. To provide some information, the Northwest Experiment Station conducted a trial with ewes during the last five weeks of gestation.

Table 1. Effect of vomitoxin on Ewes in Late Gestation

Item	Vomitoxin level in Diet, DM		
	Control	6 ppm	12 ppm
No. of ewes	6	6	6
Total lambs born	11	11	15
Lambs born/ewe[a]	1.83	1.83	2.50
Lamb birth wt, lb	11.1	11.1	9.3
Lambs weaned/ewe[b]	1.60[c]	1.67	1.67
Lamb weaning wt, lb	52.7[c]	52.7	49.8

[a] Two ewes on each treatment had singles.
[b] Lambs in excess of two were removed.
[c] One ewe on the control diet rearing twins died from mastitis 2 days postpartum. This ewe and her lambs were excluded from the weaning data.

Eighteen fall-lambed 3-year-old Polypay-type ewes that were estrus synchronized and bred on November 27, 1993 and determined to be pregnant were randomly allotted to the following three treatment groups on March 21: 1) Control (low vomitoxin, 0.2 ppm); 2) 6ppm vomitoxin and 3) 12 ppm vomitoxin in the diet on a dry matter basis. The high vomitoxin (12 ppm) group received a diet of 2.0 lb of barley containing 29 ppm of vomitoxin DM basis and 2.2 lb of alfalfa haylage DM. The medium vomitoxin group (6 ppm) received 1.0 lb of the high vomitoxin barley and 3.2 lb of alfalfa haylage DM and the control received 1.0 lb of low vomitoxin barley and 3.2 lb haylage DM.

As shown in Table 1, feeding a diet containing 6 or 12 ppm of vomitoxin (barley scab origin) on a dry matter basis during the last five weeks of gestation had no apparent detrimental effect on lambs born and reared per ewe, ewe health, lamb birth vigor, birth weight, lamb health or weaning weight. All ewes lambed and all lambs were born alive with excellent vigor, including two sets of quadruplets born to ewes fed the diet with 12 ppm vomitoxin. No problems were observed with feed intake of ewes when the diet contained 6 or 12 ppm of vomitoxin.

Speculation is that if there is a detrimental effect on pregnancy, it would probably be in early pregnancy so until information is available it is still advisable to avoid feeding grain with a high level of vomitoxin during early gestation. To obtain additional information on the effects of vomitoxin on reproduction, particularly early gestation, another trial utilizing 24 estrus synchronized 4-year-old Polypay-type ewes was initiated on September 14, 1994. In this trial, 12 ewes will be fed an alfalfa haylage-dry barley diet with high vomitoxin (15 ppm, DM basis) for the entire gestation beginning September 22 (7 days after breeding). The control group of 12 ewes bred by the same rams will be fed the same diet with low vomitoxin (0.2 ppm). The high vomitoxin barley contains 30 ppm of vomitoxin.

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The Northwest Experiment Station News
Patti Malme, Associate Editor

Address Correction Requested