Wisconsin Crop Manager

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Late Blight Alert - April 16, 2011

Amanda Gevens, University of Wisconsin Extension Plant Pathology

A low level of the late blight pathogen, *Phytophthora infestans*, has been detected in seed grown in Langlade County, WI. The seed sample was received on Tuesday, April 12, 2011. Tubers primarily exhibited symptoms of bacterial soft rot. The sample was not randomly collected, but was collected from culled seed tubers prior to cutting. Approximately 25% of the sample also exhibited internal symptoms of brown-rust colored, corky tissue. Lesions were dry and did not deeply penetrate the internal tissue (arrows indicate lesions in photo below).

The bacterial soft rotting pathogen, *Pectobacterium carotovorum,* was isolated from soft lesions. Of the samples exhibiting brown-rust colored tissue, some tested faintly positive for Phytophthora with Agdia's Phytophthora ELISA Immunostrip tests. Tubers testing faintly positive by ELISA were then subjected to a molecular test which indicated weak positives for *Phytophthora infestans.*

We do not yet know the genotype of the late blight pathogen detected. In 2010, the genotype identified in Langlade County was US-22. The US-22 can be controlled by mefenoxam (Ridomil), is of the A2 mating type, and is pathogenic on both tomato and potato. US-22 was also present in WI in 2009 and was believed to have been disseminated by infected tomato transplants in the U.S. Other genotypes identified in WI in 2010 included US-23 and US-24. Table below details characterization of each genotype.

Genotype	Mefenoxam sensitivity	Matin g type	Temperature favoring greatest growth	Comments on host range
US-22	Sensitive	A2	24°C	Can infect tomato and potato; could not infect foliage of single variety of tomatillo, eggplant, pepper, ground cherry; could infect foliage of hairy, black, and bittersweet nightshade
US-23	Sensitive	A1	18°C	Found on just tomato in southeastern WI
US-24	Intermediatel y sensitive with great variability	A1	20°C	Found primarily on potato

While late blight was not detected in seed production fields in Langlade County in 2010, there was some late-season late blight activity in the state which may have exposed senescing crops to the spores of late blight.

Given the sampling method and size, it is not known how widespread or with what incidence this disease risk may be. Additionally, our testing methods are highly sensitive and our levels of detection were weakly positive, indicating low quantity of pathogen. This notification is to make potato seed and production growers aware of the potential risk of late blight in the 2011 crop. Infected seed may result in a poor stand or delayed emergence, and can initiate an epidemic when disease spreads from seed piece to sprout and foliage

Controlling late blight from seed to field (early season)

7. Scout fields at emergence – looking carefully in wet and 'protected' areas of field such as along a tree line or under irrigation tower

1. Cull out seed tubers that appear rotten
2. Apply mancozeb-containing seed treatments
3. Late blight-specific fungicides with seed application labels include: Curzate 60DF
4. Sanitize seed cutter between lots and periodically during cutting
5. Keep cutters sharpened
6. Apply late blight-specific fungicides tank-mixed with chlorothalonil or mancozeb at crop emergence (ie: Curzate, Revus Top, Forum, Previcur)
7. Scout fields at emergence – looking carefully in wet and 'protected' areas of field such as along a tree line or under irrigation tower

The "Gold Book" –

STUDIES ON CULTURAL PRACTICES AND MANAGEMENT SYSTEMS FOR CORN

Joe Lauer, Extension Corn Agronomist

Editor's correction: A report of the Wisconsin Corn Agronomy program's "Gold Book" - 2010 research entitled, STUDIES ON CULTURAL PRACTICES AND MANAGEMENT SYSTEMS FOR CORN is now available and featured in this week's WCM newsletter. An older Wisconsin Corn Agronomy publication entitled, 2010 Wisconsin Corn Hybrid Performance Trials, was posted in error in last week's April 14th WCM newsletter. Both Agronomy publications are accurate and up to date, however, WCM intended to highlight the more recent "Gold Book" publication. *–Eileen Cullen*

A report of our 2010 research entitled, STUDIES ON CULTURAL PRACTICES AND MANAGEMENT SYSTEMS FOR CORN, can be found at http://corn.agronomy.wisc.edu/Research/Report/2010.pdf. For results of studies from individual years, please see http://corn.agronomy.wisc.edu/Research/.

Specific objectives of this project and annual corn agronomy publication focus on management decision-making regarding crop productivity, quality, and production efficiency including hybrid selection, rotation, tillage systems, and replant and yield loss damage assessments. Emphasis is on impacts of cropping practices on grower profitability, the environment, and natural resource conservation.

We appreciate the financial support, product support and cooperation from the agri-business and grower groups without which this work would not be possible. We have done our best to see that the experiment design and data collection to date is complete, timely and free from errors. However, if you detect an error when you receive your results, please call it to our attention.

As the new growing season approaches we look forward to new research opportunities, as well as, completion of some studies underway. Please feel free to suggest ways that we can cooperate in the new growing season.

Photosensitization of Sheep and Goats from Switchgrass hay

Dan Undersander, Extension Forage Agronomist

I have had a couple reports of photosensitization of sheep from feeding switchgrass hay. After feeding the hay a week or two, the sheep started exhibiting extreme sensitivity to light and muscle tremors/twitching. The sheep would seek out the darkest locations. Animals may also kick their back legs at their bellies as if shooing away flies. Inflammation and muscle twitching under their skin can sometimes be seen. Most but seldom all of the animals are be affected (older animals are least likely to be affected).

Photosensitization often looks like sunburn but is totally unrelated. Photosensitization is sensitivity to sunlight due to accumulation of compounds below the skin. These compounds are activated by sunlight and give off energy, stimulating other compounds which cause irritation in skin.

Switchgrass is known to contain saponins under some circumstances which can cause photosensitization. Usually levels of these compounds are low in switchgrass but levels are elevated by some environmental conditions and the effects are most pronounced in sheep and goats.

If observing photosensitization, the recommendation is to immediately stop feeding the hay that caused the response and to keep animals out of direct sunlight. Animals should recover in a few weeks (more slowly or rapidly depending on the amount and kind of antiquality compound(s) in the hay).

New Cover Crop Videos and Presentations Available on Soils Extension Web Site

Matt Ruark, Extension Soil Scientist, UWEX and UW-Soil Science

Interested in learning more about the nutrient, soil quality and soil conservation benefits to cover crop use in Wisconsin? A new section has been added to the Soils Extension Web site (www.soils.wisc.edu/extension) to help organize UWEX educational materials on cover crops. The "Cover Crops" page is under the "Management Topics" heading on the left menu (www.soils.wisc.edu/extension/covercrop.php). In addition to the new page, new videos are available for viewing:

VIDEO: Cover Crops Following Winter Wheat or Corn Silage Harvest. This video is hosted on the UWEX-Cooperative Extension YouTube Channel (http://goo.gl/zO91A) and provides basic information on cover crops that can be grown in Wisconsin. The video, which is about 8 minutes in length, discusses the known advantages and disadvantages of different cover crop species, including grasses (rye, oats, ryegrass), legumes (berseem clover, red clover, hairy vetch) and brassicas (radish, mustard, turnip).

VIDEO: Cover crop presentations at the 2010 Arlington Agronomy/Soils Field Day. These videos were filmed in August of 2010 in a cover crops demonstration trial at the Arlington Agricultural Research Station Field Day. The videos, which run two to three minutes in length, include presentations on: (1) the short- and long-term benefits of cover crops (http://goo.gl/J4tid) and (2) where cover crops can fit into your cropping system (http://goo.gl/lf4Po).

Additional resources on the Cover Crops page on the Soils Extension Web site include: links to University of Wisconsin-Extension Publications on cover crop management, presentations on cover crops by Soil Science faculty, links to Wisconsin Crop Manager articles on cover crops and links to other organizations that provide science-based information on cover crop management.

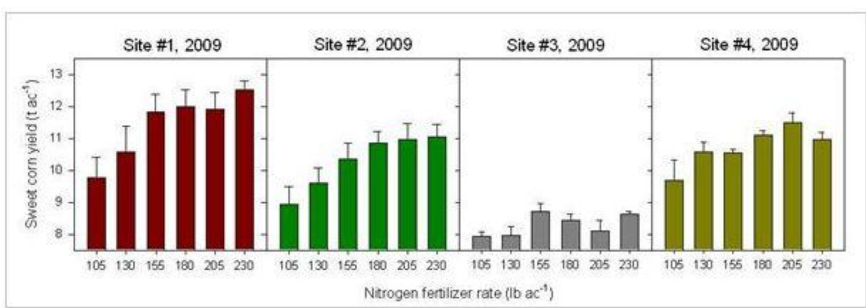
Field-Scale Evaluation of Sweet Corn Response to Nitrogen Fertilizer Application Rates on Wisconsin's Central Sands: Results After Two Years of Data Collection

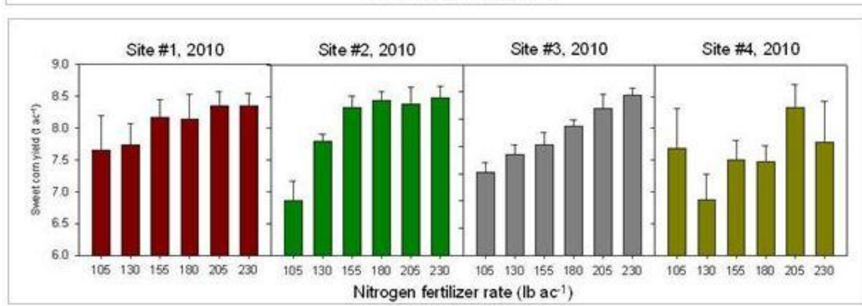
By Ken Schroeder, Matt Ruark, and Don Genrich

Wisconsin ranks second in the nation for production of sweet corn for processing, growing over 88,000 acres annually, or 24% of the total United States processing sweet corn acreage (USDA 2008). This production requires substantial nitrogen fertilizer inputs. University of Wisconsin publication A2809 Nutrient Application Guidelines for Field, Vegetable, and Fruit Crops in Wisconsin, recommends applying 70 to 150 lbs of nitrogen (N) per acre, depending on soil organic matter content, to grow two to ten ton of sweet corn per acre. University of Minnesota recommends 170 lb/ac of N for sweet corn following non-legumes with organic matter <3.1% and a yield goal of ten ton or more per acre (irrigated sandy soils). Current production practices have growers applying 200 plus lb/ac of N on irrigated sweet corn. Sweet corn is a high-value crop and even with the relatively high cost of N fertilizer, growers are not willing to be short on N. So the question arises, Are University nitrogen fertilization recommendations still adequate? We have very little current information regarding the advantages and disadvantages of over applying N on sweet corn. Things have changed since the research was done to develop the current N recommendations. We have new hybrids with greater genetic yield potential and many growers are managing their fertilizer applications better using split applications to meet and not exceed plant needs at each growth stage. Does all this lead to better nitrogen use efficiency and in turn, a need for less nitrogen to meet our yield goals?

What we did: To address these questions, Ken Schroeder, Portage County UW-Extension Agriculture Agent worked with Dr. Matt Ruark, UW-Madison soil scientist, Don Genrich, Adams County UW-Extension Agriculture Agent, and a central Wisconsin sweet corn processor to do on-farm field trials looking at sweet corn response to nitrogen fertilizer application. In 2009 we had three locations in Waushara County and one in Adams County, four planting dates (April through June), six nitrogen (N) levels from 105 to 230 lb/ac of N, and four replications per field. This same experimental design was used in 2010 in different fields. Three were again located in Waushara County and one in Adams County. Yield data was collected for analysis.

What we learned: 2009 was an unusually cool growing season with an extended dry period mid-summer leading to low plant stress and higher than average yields. The two early planted sites (April 28th, Site 1 and May 9th, Site 2) showed a classic response curve with yields plateauing at 155 lb/ac of N. Yields from N application rates higher than 155 lb/ac were not significantly different than yields at 155 lb/ac. At Site 4, planted on June 15th, N rates greater than 155 lb/ac did not statistically increase yield, although the yield from 205 lb/ac of N was about 1.0 ton/ac greater. This highlights a major issue of growing irrigated sweet corn on sandy soil: even though there is a relatively low chance of a yield gain above 155 lb/ac of N, many growers are willing to take the economic risk of using greater amounts of N to gain 0.5 to 1.0 ton/ac in yield. In most cases greater yields with greater N rates reflects the fact that there were larger N leaching losses from these systems, not necessarily greater N use efficiencies. Lastly, Site 3, planted June 1st, is difficult to explain with low yields across the board and no statistical differences between N application rates. Error bars in figures below represent standard error.





In 2010, growing conditions were warm and unusually wet with many rain events in excess of one inch and up to five inches leading to flooding and probable N leaching in some areas. The 2010 trials produced similar results to 2009 for the early planting dates (Site 1 and Site 2), with yields optimized at 155 lb/ac of N. The later planting dates (Site 3 and Site 4) again responded differently when compared to early planted sweet corn, which raises the question, "Does planting date affect optimal nitrogen fertilizer rate?"

Conclusions after two years:

- Under favorable weather conditions, yields greater than 10 ton/ac can be achieved with only 155 lb/ac of N.
- There was no statistical advantage to applying more than 155 lb/ac of N at 83% of the sites, thus there is a low probability of a yield gain by increasing N application rates above 155 lb/ac.
- Early planted sweet corn responded differently to N applications than late planted sweet corn.
- Future research will focus on the relationship between planting date and response of sweet corn to N fertilization.
- The potential yield gains with greater amounts of N at sites planted later in the season (Site 4, 2009; Sites 3 and 4, 2010) reflect inefficiencies in fertilizer application. Sweet corn yields from later planting dates were not greater than sweet corn yields from earlier planting dates, but required greater amounts of N to maximize yield.
- More data is needed before nitrogen application guidelines can be updated.
- This study will be continued in 2011.

Thoughts to ponder:

1. Having more N available than a crop can utilize at any given growth stage increases the risk of nitrogen loss, which is costly to the grower due to no return on that investment and can potentially have negative effects on our groundwater.
2. We grow about 88,000 acres of sweet corn annually. At current nitrogen fertilizer costs, if growers use 25 lbs less nitrogen per acre, they could save nearly ¾ million dollars and use over 2 million tons less nitrogen. At 50 lbs less, savings would total $1.5 million.

Selecting a N fertilizer rate when corn is $7 per bushel

Carrie Laboski, Extension Soil Scientist, Dept. of Soil Science, Univ. of Wisconsin-Madison

With the current price of corn in the $7/bu range, growers and agronomists have been asking if they should reconsider their N application strategy with regard to rate, time of application, and use of inhibitors or slow release products. This article will address the issues that growers and agronomists need to consider when selecting a N application rate.

Selecting a N fertilizer rate. Using the MRTN (maximum return to N) approach to selecting a N fertilizer rate is just as valid this spring as it is any spring. A key thing to remember is that when N and corn price levels increase, risk increases. The N rate guidelines are provided in Table 1. The first step in selecting an appropriate N rate is to identify the previous crop and soil yield potential for your field. The soil yield potential is based on soil properties such as water holding capacity, drainage class, depth of root zone, and length of growing season. A table listing each soil's yield potential can be found in UWEX publication A2809 *Nutrient application guidelines for field, vegetable, and, fruit crops in Wisconsin.* (http://www.soils.wisc.edu/extension/pubs/A2809.pdf)

See Table 1.

The next step in selecting an appropriate N rate is to determine the N to corn price ratio. If the N:corn price ratio is calculated based on prices that are relevant today, $0.54/ lb N and $7/bu corn, then the ratio is 0.08. *(See calculating the N:corn price ratio below for instructions on this calculation.)* This price ratio is not all that different than it has been over the past several years. A price ratio of 0.08 falls between two of the price ratios on the N rate guidelines table (see Table 1). The

Table 1. Corn N rate guidelines using the maximum return to N (MRTN) approach.

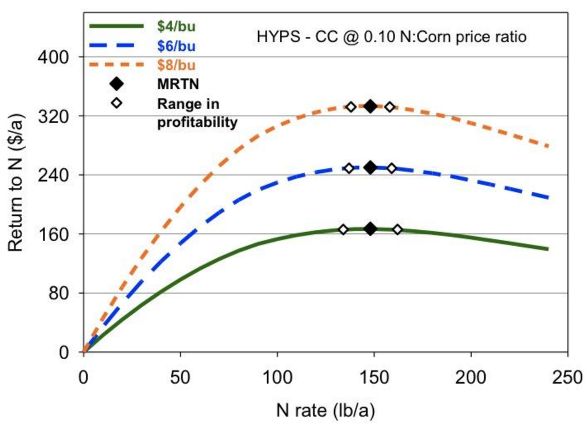
Soil Yield Potential[1]	Previous Crop	N:Corn Price Ratio			
		0.05	0.10	0.15	0.20
		lb N/a (total to apply)[2]			
High/Very High	Corn, Forage & Vegetable legumes, Green manure[5]	**170**[3] 155 – 185[4]	**150** 135 –160	**130** 120 – 145	**115** 105 – 125
	Soybean, Small grains[6]	**140** 125 – 160	**120** 105 – 135	**105** 95 – 115	**95** 80 – 105
Medium/Low	Corn, Forage & Vegetable legumes, Green manure[5]	**125** 110 – 140	**110** 100 – 115	**100** 95 – 110	**95** 85 – 100
	Soybean, Small grains[6]	**110** 90 – 125	**85** 70 – 95	**70** 60 – 80	**60** 50 – 70
Irrigated sands/loamy sands	All	**215** 205 – 225	**205** 195 – 215	**195** 180 – 205	**180** 170 – 195
Non-irrigated sands/loamy sands	All	**140** 130 – 150	**130** 120 – 140	**120** 110 – 130	**110** 100 – 120

[1] To determine soil yield potential, consult UWEX publication A2809 or contact your county agent or agronomist.
[2] Includes N in starter.
[3] Maximum return to N (MRTN) rate
[4] Profitability range within $1/a of MRTN rate.
[5] Subtract N credit for forage legumes, legume vegetables, animal manures, green manures.
[6] Subtract credits for animal manures and second year forage legumes.

N rates in the 0.10 price ratio column can be used for this situation because the 0.08 price ratio rounds to 0.10. Alternatively, a grower can select a N rate that is between the rates in the 0.05 and 0.10 columns.

Growers and agronomists should be aware that as price levels increase there is greater risk of reducing profitability by applying too much N. Figure 1 shows the return to N fertilizer when the N:corn price ratio is fixed 0.10, but the price levels change; for example, $0.40/ lb N and $4/bu or $0.60/lb N and $6/bu or $0.80/lb N and $8/bu. These data show that the economic penalty for over application of N fertilizer is much greater at higher price levels and somewhat greater for medium/low yield potential soils compared to high/very high yield potential soils. Thus applying higher than recommended N rates to reduce the risk of losing yield when corn is $7/bu will increase the probability of reducing profitability.

When data in the UW corn N response data base is analyzed, the N rates identified in the 0.05 N:corn price ratio column of Table 1 produce maximum yield. Applying N at rates greater than those suggested for the 0.05 price ratio will never be profitable and are not allowed under current nutrient management regulation. The yield differences between fertilizing at the 0.10 price ratio and the 0.05 price ratio are generally very small, zero to a few bu/a. Remember, if the price ratio that is appropriate for you farm this year is 0.10, applying N at higher rates may get you a couple more bushels of corn, but will reduce profitability.



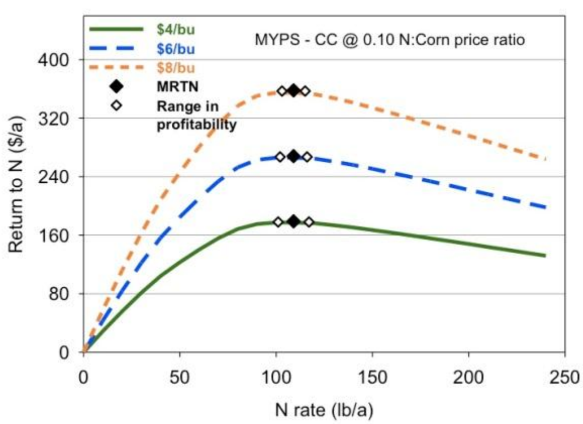


Figure 1. Return to N fertilizer as a function of N applied when the N:corn price ratio is fixed at 0.10 and the price of corn varies from $4/bu to $8/bu. In this graph the MRTN is the suggested N rate for the 0.10 N:corn price ratio. The range in profitability is the range of N rates that produce profitability within $1/a of the MRTN. Data used to develop this graph come from the University of Wisconsin corn N response database for corn following corn on high or very high yield potential soils (TOP) or medium/low yield potential soils (BOTTOM).

Remember to take N credits! The N rates in Table 1 are base N rates and credits still need to be subtracted for manure, forage legumes, vegetable legumes, and green manures as outlined in the table footnotes.

Calculating the N:corn price ratio. The N:corn price ratio is simply the price of N fertilizer in $/lb N divided by the price of corn in $/bu. The price of N in $/lb N can be determined using the following equation: [$/ton fertilizer material x (100 ÷ %N in fertilizer)] ÷ 2000. For example if urea is $500/ton, then the price of per lb N is $0.54/lb N ([$500/ton x (100 ÷ 46)] ÷ 2000).

So if corn is $7/bu, the N:corn price ratio would be $0.54/lb N ÷ $7/bu = 0.08.

Summary. The MRTN N rate guidelines are a tool that helps growers improve the profitability of their N rate decision as N and corn prices fluctuate annually. Over application of N relative to situationally appropriate N:corn price ratios will reduce profitability regardless of how high corn prices are. Higher corn and N prices mean that there is more economic risk associated with over application of N.

Latest Bt Corn Approval by EPA includes 5% Refuge In The Bag

Eileen Cullen, Extension Entomologist

The EPA recently approved a 5% refuge-in-the-bag (RIB) Bt Corn. This registration is a licensing agreement between Monsanto and Dow AgroSciences.
Genuity® SmartStax® RIB Complete™ (Monsanto) and REFUGE ADVANCED™Powered by SmartStax® (Dow AgroSciences) are both a blend of 95% Genuity SmartStax corn seed (GENSS) and 5% refuge (non-Bt) seed that farmers can plant across the field as a seed blend. No structured refuge is required. These two 5% RIB Bt corn hybrid options will be available for limited planting in 2011, with full-scale commercialization in 2012.

Remember, for 2011 SmartStax (Dow AgroSciences) without REFUGE ADVANCED™ and Genuity SmartStax (Monsanto) both still require a 5% structured refuge planted in rows within the field or as an adjacent block. In 2012, you will likely see Genuity SmartStax (GENSS) offered exclusively as a 5% RIB Complete product from Monsanto. My understanding is that Dow AgroSciences will continue to offer both SmartStax as a 5% structured refuge, and REFUGE ADVANCED Powered by SmartStax as a 5% RIB product.

Another new Bt corn registration is Agrisure Viptera 3220 (Syngenta), containing three above ground traits. Two of the three traits (Cry1Ab and Cry1F) are pyramided and stacked with a third trait (Vip3A). The pyramided traits allow a 5% structured refuge to be planted in rows within the field, or as a block up to ½-mile away.

A previous Wisconsin Crop Manager newsletter article provides information on pyramided vs. stacked traits and explains the concepts behind EPA registration of reduced structured refuge percentage and refuge-in-the-bag.

Chris DiFonzo, Extension Entomologist, Michigan State University, and I have updated the 'Handy Bt Trait Table' publication to reflect the new Bt corn registrations explained in today's article.

Click here to access the latest update (April 2011) of the MSU/UW-Extension 'Handy Bt Trait Table' to keep track of Bt corn registrations, insect pests controlled and suppressed, and refuge percentage and location (structured or in the bag) heading into the 2011 growing season.

Influence of crop rotation and nitrogen fertilizer on oat yield

Matt Ruark, Dept. of Soil Science, Tim Wood, Lancaster Agricultural Research Station

Current UWEX nitrogen (N) application guidelines for oats are 40 lb/ac for soils with 2 to 10% organic matter and 60 lb/ac for soils with less than 2% organic matter. When oats follow soybean, UWEX guidelines would suggest no need for N fertilizer on most mineral soils, as there is a 40 lb/ac soybean rotation "N credit". This credit reflects the fact that yields of small grain crops following soybean are optimized with 40 lb/ac less N compared to when following corn or other grain crops. This N credit does not mean that growing soybean results in an extra 40 lb/ac of N in the soil at the end of the season. In fact, the net N balance during a soybean is often zero and become negative with greater yields (i.e. more N is removed as grain compared to the amount of N fixed by the plant).

To evaluate optimum N rate for oats following corn or soybean, we established an N rate study in 2010 at the Lancaster Agricultural Field Station. We applied four different rates of ammonium nitrate fertilizer (0, 40, 80 and 120 lb/ac of N), when oats were 2 inches tall. The oat variety was Esker and planted April 14th, 2010 at a rate of 3 bu/ac. Deep soil cores (0-1' and 1-2') were collected prior to planting, one value per rotation, and the PPNT values were 85 ppm following soybean and 87 ppm following corn. While the PPNT has not been calibrated for oats, we can use the PPNT to confirm that these sites were similar in amount of residual nitrate. For comparison, based on these PPNT levels, if we were growing winter wheat, we would reduce N applications by 35 to 37 lb/ac of N (subtract 50 ppm from PPNT value).

Oat yields were greater following soybean compared to following corn (Fig. 1). When following soybean, oat yields

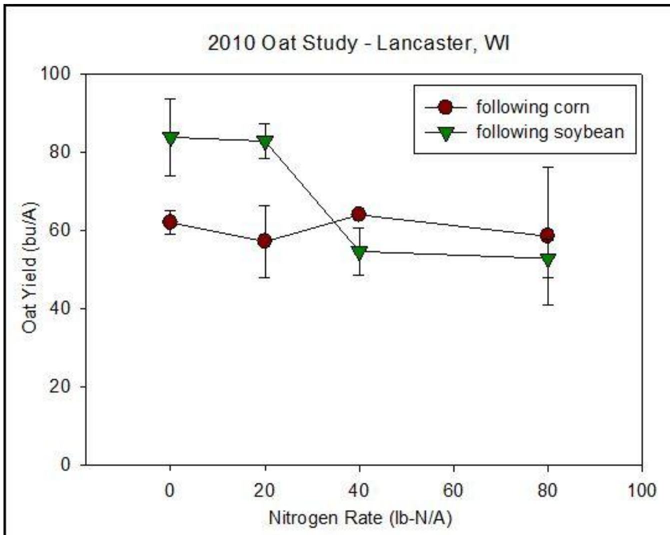


Figure 1. Oat yield response to applied nitrogen in 2010. Error bars represent standard error.

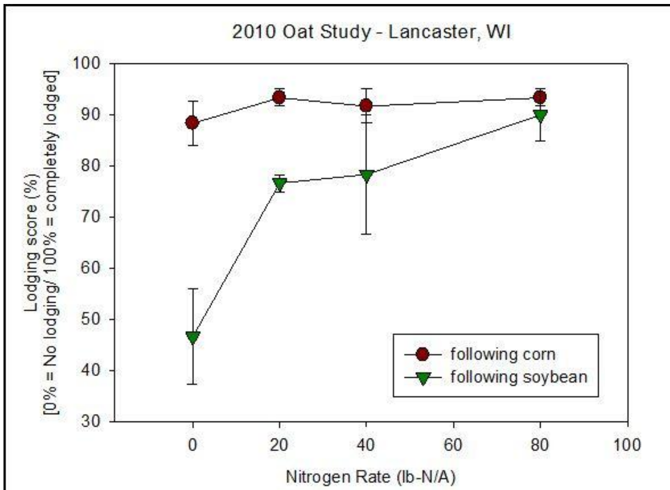


Figure 2. Percent of lodging in oat plots receiving different N application rates (0% = no lodging, 100% = completely lodged). Error bars represent standard error.

were the greatest with 0 lb/ac of N and decreased when more than 20 lb/ac of N was applied. There was no oat yield response to N when oats followed corn. When following corn, oat yields at the recommended rate of N (40 lb/ac) were 64 bu/ac, but this was not significantly greater than yields at 0 lb/ac of N (62 bu/ac) or at 20 lb/ac of N (57 bu/ac) (Fig. 1). Severe lodging occurred within all plots, with the least amount of lodging (40 to 55%) occurring when no N was applied to oats following soybean (Fig. 2). Severe lodging (>85%) occurred across all N rates for oat following corn and when compared at the same N rate, there was less lodging for oats following soybean compared to following corn, except for at 80 lb/ac of N, where lodging was similar for both rotations.

These results clearly support taking the 40 lb/ac "N credit" for oats following soybean. Any application of N to oats following soybean resulted in decreased yields, severe lodging and a reduction in economic return. When oats follow corn in a high residual nitrate environment, it also does not pay to apply N to oat. If we were to apply the PPNT credit based on a credit calculated for winter wheat, the recommended application rate would effectively be 0 lb/ac of N. Since the N rate of 0 lb/ac was the economically optimum N rate for oat following corn, this data would suggest that PPNT could be used for oats in a similar manner as used for winter wheat.

Recent research has verified the soybean rotation credit for winter wheat (goo.gl/NpELO), as well as the negative consequences resulting from over-applying N. Small grain crops are an excellent crop to grow to increase the length of your crop rotation, but it is important select your N rates wisely. This trial will be repeated again in 2011 to verify the use of PPNT for oats.

UW-Extension/Madison Plant Disease Diagnostic Clinic (PDDC) Update

Brian Hudelson, Ann Joy, Amanda Zimmerman and Adam Greene, Plant Disease Diagnostics Clinic

The PDDC receives samples of many plant samples from around the state. The following diseases/disorders have been identified at the PDDC since January 1, 2011:

PLANT/SAMPLE TYPE	DISEASE/DISORDER	PATHOGEN	COUNTY
FIELD CROPS			
Barley	Seedling Blight	*Fusarium graminearum*	Dane
FORAGE CROPS			
Alfalfa	Crown Rot	*Phoma* sp.	Dane
Clover	Crown Rot	*Fusarium* sp.	Dane
VEGETABLES			
Potato	Silver Scurf	*Helminthosporium solani*	Portage
Sweet Potato	Fusarium Dry Rot	*Fusarium* sp.	Portage

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.