Wisconsin Crop Manager

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2011 Pest Management Field Day - July 6

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Arlington Agricultural Research Station

Please remember to join us July 6 for the Pest Management Field Day. We'll have several topics from ongoing research projects we hope you'll find valuable as well as some time you can use to network with colleagues.

Speakers and topics are:

Controlling Glyphosate Resistant Volunteer Corn

- Vince Davis, Agronomy

Bt Corn Isn't Just for Corn Borer Any More…..Understanding Refuge Requirements for Stacked Traits

-Eileen Cullen, Entomology

Soybean Aphid Plant Resistance Update

- Dave Hogg, Entomology

Driftwatch; A Voluntary Online Registry to Help Protect Sensitive Crops From Pesticide Drift.

-Jed Colquhoun, Horticulture

Soybean Seed Treatments: What is the probability that they pay for themselves?

-Shawn Conley, Agronomy

Update on Research for White Mold of Soybean

-Angie Peltier, Plant Pathology

Using Multiple MOA for Weed Management in Roundup Ready Alfalfa

- Mark Renz, Agronomy

Herbicides to Improve Prairie Wildflower Establishment

- Mark Renz, Agronomy

Effect of Aminocyclopyachlor on Pasture Grass Yield

- Mark, Renz, Agronomy

Field tours will depart from the Public Events Facility at 8:30 am and return around noon. In case of rain, "field tours" will be conducted inside. A light lunch will be provided.

After lunch we will demonstrate new technology that will enable some of the information within A3646 (Pest Management in Wisconsin Field Crops) to be accessed remotely on smart phones and computers. At this focus group we will be asking for comments and feedback on what type of information from A3646 users would like access to and how they would envision using this technology in the future.

Also after lunch, Herbicide Demonstration plots will also be available for you to view in the usual location along Badger Lane. Weed Science faculty and staff will be available to assist with the informal tour and discussion.

The Public Events Facility is located on the Arlington Agricultural Research Station, N695 Hopkins Road. If traveling from the south, exit I 90/94 onto Hwy 51 North. Look for the Arlington Ag. Research Station sign north of Deforest. Turn left (west) onto Badger Lane. Travel 1 mile and turn left (south) onto Hopkins Rd. If traveling from the north, exit I 90/94 onto Hwy 60. Travel east through Arlington and turn south onto Hwy 51. For more detailed driving direction click on http://www.ars.wisc.edu/arlington/directions.html

Purple corn in late June, should you be concerned?

Carrie Laboski, Extension Soil Fertility Specialist, Department of Soil Science, UW-Madison

There are some corn fields in Western Wisconsin and perhaps elsewhere in the State that have the purple colorations associated with P deficiency (Photo 1). Growers with these fields are concerned that their P fertilization strategy failed this year. However, field conditions should be considered before jumping to this conclusion.

Photo 1. Phosphorus deficiency in a manure/fertilizer P response study at Arlington, WI in 2005. Initial soil test P level was 11 ppm.

Soil test P levels provide guidance on the probability of a yield increase when P is applied and the amount of P needed. Soils testing in the optimum category (~15-20 ppm for silt loams and 23-32 ppm for sands/loamy sands) have 30-60% probability of having a yield increase when P is applied. Excessively high P testing soils (>30 ppm for silt loams and >42 ppm for sands/loamy sands) have less than a 2% probability of a yield increase when P is applied, and yield increases may not be profitable. Under good growing conditions, visual P deficiency symptoms are unlikely to be seen on soils testing optimum or greater.

- When P deficiency symptoms occur, the first thing to do is look at the results of the most recent soil test report. If soil test P levels are optimum or greater and P application guidelines have been followed, P deficiency symptoms are unlikely to be observed. Thus, other field conditions need to be considered. On high P testing soils, P deficiency symptoms can occur if any or a combination of the following conditions occurred:
- *Corn was planted when the soil was too wet.* Planting in wet conditions can lead to sidewall compaction. Roots of young plants are restricted to a narrow band and can temporarily exhaust the P supplying capability of the soil in that small volume of soil. Once roots penetrate the sidewall, the plants can access a greater volume of soil and more P. Applying more P to increase soil test levels into the excessively high category may not eliminate P deficiency associated with sidewall compaction.
- *Compacted soil.* Roots don't explore as much soil when the soil is compacted as a result of trafficking or planting in wet conditions.
- *Poor early season weather.* Slow crop growth can occur under unfavorable growing conditions such as too little heat and sunlight as well as too little or too much rainfall. In cool weather the crop is slow to grow and roots grow slowly as well. If conditions are wet, roots may not explore a large volume of soil because the plant can take up adequate water in a limited soil volume. Limited root exploration of the soil will limit uptake of immobile nutrients like P.

If corn fields are showing P deficiency on optimum or greater P testing fields, it is likely that limited root exploration of the soil is the "root" cause of the problem. Once the root system is larger, the P deficiency will be eliminated. While the weather cannot be controlled, growers should take actions to eliminate/minimize compaction to avert temporal P deficiency problems in the future.

Assessing the Potential for Nitrogen Loss from Heavy Rainfalls

Carrie Laboski, Extension Soil Fertility Specialist, Department of Soil Science, UW-Madison

Several inches of rainfall over the past week and a half have many growers and agronomists concerned about the potential for N loss. The amount of N loss is dependent on soil moisture and drainage along with the form and timing of N. Nitrogen loss can occur through denitrification and leaching.

Denitrification

Denitrification is the process whereby nitrate is converted to the gases dinitrogen or nitrous oxide and subsequently released to the atmosphere. This conversion is carried out by soil bacteria. Denitrification can be a significant mechanism for N loss on medium- and fine-textured soils. It is generally not an issue on coarse-textured soils because they do not remain saturated for any length of time. There are several environmental factors that determine if denitrification occurs and to what extent.

1. *Nitrate.* Nitrate must be present for denitrification to occur. If nitrate is not present or is in low concentrations, denitrifiaction losses will be minimal.
2. *Soil water content and aeration.* Denitrification occurs in wet soils with low oxygen concentrations. Denitrification increase with the length of time the soil is saturated. Standing water may result in a greater percentage of nitrate being denitrified.
3. *Temperature.* Denitrification proceeds faster on warmer soils, particularly when soil temperature is greater than 75°F. Table 1 shows the combined effect of soil temperature and days of saturated soil on N loss.

4. *Organic matter*. Denitrification occurs because soil bacteria are breaking down organic matter under low oxygen conditions and the bacteria use nitrate in a biochemical process. Soils with low soluble organic carbon will have less potential for denitrification than soils with high soluble organic carbon. Thus, nitrate that resides deeper in the soil profile (eg. below 12 inches) where there is less organic matter will have a greatly reduced or minimal probability of being denitrified.

5. *Soil pH*. Denitrification is negligible in soils with a pH < 5.0. Thus, pH likely doesn't limit denitrification on most of our cropland in Wisconsin.

It is important to keep in mind that nitrate must be present for denitrification to occur. So N losses will depend on the form of N that was applied and the time between application and saturated soil conditions. Table 2 provides estimates of the time it takes for various N fertilizer materials to transform to nitrate. Conversion of ammonium based fertilizers to nitrate takes 1 to 2 weeks. Urea must first be hydrolyzed to ammonium before it is converted to nitrate. If a urease inhibitor (eg. Agrotain) was used with urea, then the length of time that it takes for urea to convert to ammonium may be extended 10 to 14 days depending upon the rate of inhibitor used. Injection of anhydrous ammonia increases the soil pH for several weeks, which in turn limits the amount of ammonium that is converted to nitrate. If a nitrification inhibitor (eg. Instinct, NServe, DCD) was used, it will also extend the time it takes for ammonium to convert to nitrate.

Table 1. Estimated N losses from denitrification as influenced by soil temperature and number of days the soil is saturated. (From Shapiro, University of Nebraska)

Soil temperature (°F)	Days saturated	N loss (% of applied)
55 to 60	5	10
	10	25
75 to 80	3	60
	5	75
	7	85
	9	95

Table 2. Approximate time until fertilizer N is in the nitrate form.

Fertilizer material	Approximate time until ammonium	Approximate time until nitrate
Ammonium sulfate, 10-34-0, MAP, DAP	0 weeks	1 to 2 weeks
Anhydrous ammonia		3 to 8 weeks
Urea	2 to 4 days	1.25 to 2.5 weeks
Ammonium nitrate	50% is ammonium, 0 weeks	25% in 1 to 2 weeks 25% is nitrate, 0 weeks
UAN	50% from urea in 2 to 4 days 25% is ammonium, 0 weeks	50% in 1.25 to 2.5 weeks 25% in 1 to 2 weeks 25% is nitrate, 0 weeks

Here's an example of how to estimate the amount of nitrate that might have been lost through denitrification. Let's assume:

1. 120 lb N/a as UAN was applied four days before saturated soil conditions existed
2. The soil remained saturated for five days.
3. The average soil temperature at a four inch-depth has been 75°F.

In this situation only a minimal amount of the urea and ammonium forms will have been converted to nitrate in four days before the soil became saturated. Thus, only the nitrate portion of UAN is susceptible to N loss. This is 30 lb N/a (120 lb N/a x 25% as nitrate) (Table 2). Approximately 75% of the nitrate could be expected to denitrify in the five days when the soil was saturated resulting in a potential for 22.5 lb N/a to be lost (30 lb N/a as nitrate x 75% of nitrate denitrified) (table 1). Please note that these are estimates of N loss, and should not be considered exact.

Leaching

Nitrate is the form of N that can be leached when precipitation (or irrigation) exceeds the soil's ability to hold water in the crop root zone. Leaching is a much bigger issue on sandy soils that typically hold 1 inch of water per foot of soil compared to medium- and fine-textured soils that hold 2.5 to 3 inches of water per foot of soil. To determine if nitrate could leach out of the root zone, compare the rainfall totals in your area to the number of inches of water that your soil can hold in the crop root zone. The amount of N loss from leaching is dependent not only on rainfall, but also on the amount of N in the nitrate form. Use the information in Table 2 to estimate how much nitrate may have been leached.

Urea is highly water soluble. If the leaching rainfall occurred before urea had time to hydrolyze (2 to 4 days), then urea may have leached. However, if there were more than 4 days between urea application and the leaching rainfall, then it is likely that all of the N would have converted to ammonium and remains within the root zone.

Supplemental N applications

If all of the N was applied prior to the heavy rainfall, try to determine how much N loss may have occurred. The next step is to decide whether or not you need or want to apply supplemental N fertilizer to your corn crop. When making this decision, compare the amount of N loss (in lb N/a) that you think may have occurred to MRTN rate and profitable range of N rates for your N:corn price ratio. For example let's say that corn follows soybean on a high yield potential soil and you applied 150 lb N/a preplant and now estimate that you lost 25 lb N/a. If your N:corn price ratio is 0.05, then the profitable range of N rates is 125 to 160 lb N/a. Thus, even with some N loss, you might still be within the profitable range of N rates. If you are uncertain how much N may have been lost and the corn is clearly deficient in N, then application of 50 lb N/a should result in profitable yield increases.

Where the entire crop N requirement has not yet been applied, sidedress or other postemergence applications should contain the balance of the crop N requirement plus 25 to 50% of the fertilizer N that was already applied.

Options for applying supplemental N, when it is needed, include traditional sidedressing with anhydrous ammonia or N solutions. UAN solutions can also be applied as a surface band. Dry N fertilizers (urea, ammonium sulfate, or ammonium nitrate) can be knifed in or broadcast applied to the crop. Leaf burning from solution or dry broadcast applications should be expected. Appling the dry materials when foliage is dry will help minimize burning. Broadcast N rates should be limited to 90 lb N/a for corn with 4 to 5 leaves and to 60 lb N/a for corn at the 8-leaf stage. Under N deficient conditions, corn will respond to supplemental N applications through the tassel stage of development if the N can be applied.

Late Blight on Long Island

Amanda Gevens

Please see message below from Dr. Meg McGrath of Cornell University regarding late blight on Long Island.

On June 28 I examined tomato fields at 3 farms and potato fields at 2 farms all with late blight. Late blight was also reported on potatoes in VA and DE.

The fields on Long Island are all on the South Fork where long periods of morning fog make conditions even more favorable for late blight then elsewhere on LI; one grower commented that during the recent rainy period there was one week without sun. All fields examined were in close proximity.

Here are details:

Farm 1. This grower contacted extension staff as well as other growers nearby last Friday. His crops were much more severely affected than the others we examined. He only grows tomatoes. Produces his own transplants (most growers here do this). 2 fields. He was one of very few growers who had LB last fall on LI. That outbreak was in a field about 700 ft from the field that he felt was most severely affected on Friday (not suggesting this is the source, but an interesting fact). His two fields had a severe section encompassing several rows with at least 75% of plant tissue affected. Symptoms were on leaves, stems, and fruit. Plants are on plastic, not staked. When he sprayed Field #1 on 6/15 it looked fine; used Endura + Actigard so there was no fungicide with LB activity on these plants. One week later after 2 rains (6/17 and 6/22) he looked at Field #1 and noticed 'it was pretty bad'. Looked at his other field (the one closest to the 2010 outbreak; #2) and felt it was more severe. These sections looked similar on 6/28. Younger plantings in these fields were much less severely affected (about 5-10%). Planted around April 25 and on May 13-14. He dumps waste vegetables from his farm stand along the deer fence near Field #1. There were a few very small tomato volunteers with some LB symptoms growing in this area; it did not look likely they were the source.

Farm 2. Only grows tomatoes. LB observed in both fields at a very low level. Crops likely affected as a result of spread from Farm 1 based on fact crop was much less severely affected and LB most severe in the field (#2) closest to Farm 1 (about 500 ft) and at the start of row where closest. Couple plants looked like pathogen had completed one cycle in the crop as there were areas in the canopy with a few severely affected leaves with old-appearing symptoms and leaves near-by with small, very new appearing symptoms. Only leaf symptoms seen in these fields. Really had to hunt for symptoms in Field #1. Plants on plastic, trellising. Interestingly there were several plants with symptoms of pith necrosis in one field; second time I've seen on LI and first time in field-grown plants.

Farm 3. Potato, right next to Farm 2 Field #1. Only spotted one affected leaf but only walked along edge of planting (canopy closed; flowering). Crop looked excellent.

Farm 4. Only grows tomatoes. 2 plantings in one large field. Both with LB, little bit more than Farm 2. This field also very near Farm 1. Plants are on plastic, not staked. Stem and leaf symptoms present. Saw 2 plants with only 1-2 stem symptoms. These plants had a lot of bacterial speck symptoms (only farm with this disease).

Farm 5. Potato. This grower also contacted us. Saw areas with severely affected plants while spraying Bravo on 6/27, one week after previous spray. 15 and 35 A fields. Looked at one of these areas - small circular area with a few severely affected plants, scattered symptoms on surrounding plants. Symptoms on leaves, stems, and growing tips. Looked like an aggressive strain.

Samples were collected from all fields and shipped to Bill Fry. Our vegetable extension specialist will be scouting other potato fields on the South Fork on 6/29.
She did not find symptoms in any of the tomato fields in the IPM program on the North Fork scouted last week.

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

Brian Hudelson, Ann Joy, Amanda Zimmerman, Adam Greene, and Erin Schmid, 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 from June 22, 2011 through June 28, 2011:

PLANT/SAMPLE TYPE	DISEASE/ DISORDER	PATHOGEN	COUNTY
FRUITS			
Strawberry	Leaf Spot	*Ramularia* sp.	Iowa
	Root/Crown Rot	*Fusarium* sp., *Rhizoctonia* sp.	Iowa

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

Corn Market Changes

David C. Moll, Grain Marketing Outreach Specialist,
University of Wisconsin Extension

USDA released two important reports this morning that likely have set the tone for trading through harvest. The report was very bearish for corn, use of the 2010 corn crop has slowed and acreage for the 2011 crop was increased up to 92.3 million acres. The corn market took hits from multiple angles. The highs have likely been placed for grains, the tightness in corn ending stocks which supported higher prices is not the situation anymore.

In last weeks article, "Corn: The Price Roller Coaster Continues. Is Demand Slowing?" of the Wisconsin Market Bulletin, we pointed out indications that the market may have turned and additional signals to look for to reconfirm. USDA indicated this morning that demand for corn has slowed as a result of the higher prices and production prospects for the 2011 crop are also increased, both are bearish news for corn. Prior to this morning's report for the 2010 corn crop, expectation of stocks has been as low as 695 million bushels or a mere 5.2% of stocks for next year's demand, a record tight level. Since demand has slowed, the new expected carryout could come much closer to a 900 million bushel carryout a much more comfortable level for the market. When in the upper plateau of prices, these changes mean a big difference on where price needs to be. Realistically, that changes the landscape for old crop prices and support for new crop prices, prices can retrench fairly quickly. At the higher prices corn just has not been used. Corn has been put at such a high premium relative to other possibilities that other "cheaper" feeds were being used, the lack of use added carryout for the 2010 crop year.

In the same breath USDA also indicated that there were actually 92.3 million acres of corn planted this spring. This is another big piece of bearish information for the market. This is based on a producer survey from June 1, keep in mind though that 14% of the corn crop was not planted when the survey was taken so there could be some flexibility in this number as the season progresses as some important production states were still far away from complete planting (see Wisconsin Market Bulletin – June 30: USDA Will Release Acreage Report). Ohio was only 19%, Indiana was 59% and Michigan was 67% so there could be some difference between what a grower thought he was going to plant on that day and what ended up happening. Since crop insurance preventive plant claims are not made until June 5 for those states, there could still also be some acreage that is reduced. Never-the-less the 92.3 million planted acres was a surprise to the market adding an additional 292 million bushels of corn to next year's corn balance sheet. In January USDA expected about 92 million acres to be planted, so this is not a big jump from that, but it is because it is higher than traders were expecting and it is 2 million acres higher than was USDA had in the U.S. Corn Supply and Demand table on June 9, 2011.

This is not to say that if demand charged back and/or yield prospects were significantly reduced that prices could test higher levels again but for the next couple of months the pricing environment has changed and the highs have likely been placed near $8.00 a bushel. The price does not need to be as high with the current balance sheet as there are extra bushels for the market to work with. As Bruce Jones indicated at the Status of Wisconsin Agriculture in January, "higher prices do two things, curb usage and incentivize more production" and it looks like that is what has happened. Old crop prices are down 80 cents on the day, while the remaining contracts are trading limit down of 30 cents. As protection for the market there are limits in place so that prices do not go from one extreme to the other as new information enters the market. After the market has had time to absorb new information and has traded on one side of the limit, the limits widen to 45 cents and 70 cents. For the closest contract month though there are no limits. Tomorrow's trade could be just as rough and then the market heads into the long holiday weekend not trading on Monday.

Soybeans were not as negatively affected by the report, but will likely face spillover pressure from the fallout in the corn price. Soybean acreage is expected to be at 75.2 million acres on the lower end of trade expectations. Soybean use has also slowed though and projected carryout is higher than what USDA had in the June 9 report.

Large price swings will remain over the rest of this year, but there is a lot of bearish pressure now facing the high prices. Links to both of today's reports are included below.

USDA Planted Acreage Report - June 30

http://usda.mannlib.cornell.edu/usda/current/Acre/Acre-06-30-2011.pdf

USDA Grain Stocks – June 30

http://www.usda.gov/nass/PUBS/TODAYRPT/grst0611.pdf