Purdue Cooperative Extension Service

August 18, 2008 - Issue 20

In This Issue

Weeds

Valor Now Labeled for Before Corn – (*Glenn Nice and Bill Johnson*)

The Valent product Valor has received a label to be used before no-till corn. The new registration allows for the application of 2 oz/A at least 14 days before planting. This is being marketed as a tank mix partner with a glyphosate product and either atrazine or 2,4-D. Valor is a PPO inhibitor that provides good to excellent PRE activity on black nightshade, lambsquarter, horseweed/marestail (emerging from seed), pigweed and waterhemp. This will allow some flexibility in planting decision changes from soybean to corn when Valor would have locked you in previously.

Plant Diseases

Goss's Bacterial Wilt and Leaf Blight on Corn - (*Kiersten Wise and Gail Ruhl*)

- First confirmed report in Indiana.

There is a new disease of corn on the scene in Indiana—Goss's Wilt. The disease was confirmed at the Purdue Plant and Pest Diagnostic Laboratory this week on field corn and popcorn samples submitted from northern Indiana. Goss's Wilt is a bacterial disease that infects susceptible varieties of sweet corn, popcorn, and hybrid corn. This is Purdue's first confirmation of Goss's Wilt in Indiana since the disease was discovered on corn in Nebraska in 1969 (1). The disease is found sporadically throughout the Midwest in limited areas and years, and is currently only present in one county in Indiana.

Goss's Wilt is caused by the Gram positive bacterium *Clavibacter michiganensis* subsp. *nebraskensis* and is characterized by distinct light tan to gray lesions filled with dark specks (Figure 1). Lesions will often appear shiny due to bacteria oozing onto the leaf surface (Figure 2). Blighted areas are common in susceptible varieties (Figure 3), and can be confused with sunscald or drought stress. The dark flecking and shiny areas within lesions distinguish Goss's Wilt from another bacterial disease, Stewart's Wilt, which

Figure 1. Diagnostic lesions of Goss's wilt with dark specks or 'freckles' present in the lesion.

Figure 2. Bacterial ooze present on the lesion surface will appear shiny in sunlight.

has elongated lesions that run parallel to the veins and taper off to a point. Goss's Wilt can also infect the vascular tissue of the plant causing a systemic infection. Infected vascular tissue appears orange to brown and can cause wilting and stalk degradation.

The bacteria overwinter in infected residue on the soil or in limited weed hosts. Reducing the amount of debris remaining on the field through conventional or limited tillage practices is of primary importance. Rotation to soybean, wheat, alfalfa or another non-host can also help encourage decomposition of infected corn debris. Replanting corn into infected corn stubble is strongly discouraged in areas where the infection has occurred.

Studies in Nebraska have shown that the bacteria is capable of being both seedborne and seed transmitted. The

Figure 3. Blighted areas in the upper canopy of infected plants.

disease is not insect-transmitted, like Stewart's Wilt, and relies on wounds for dispersal. Once seed to seedling transmission occurs, disease spreads in areas that have experienced hail-damage or wind-driven rain. Early hailstorms and recent heavy rains and windstorms likely contributed to the infection and dispersal of Goss's Wilt in fields in Indiana.

Currently, the susceptibility level of most varieties of popcorn, sweet corn, and hybrid corn to Goss's Wilt in Indiana is unknown. Partially resistant hybrids are available in other areas of the Midwest, such as Nebraska, but hybrid performance in Indiana is unknown at this time. It is important to note that fungicides will NOT have an impact on Goss's Wilt, since the disease is caused by a bacteria and not a fungus.

Other plant diseases or injuries can easily be mistaken for Goss's Wilt. Suspect samples may be sent to the Purdue Plant and Pest Diagnostic Lab for diagnosis. There is an $11.00 sample handling fee and an additional $25.00 testing fee for serological confirmation of the bacteria.

For more information on Goss's Wilt check out the University of Nebraska Extension Bulletin on the disease at the following location:

1. <https://exchange.purdue.edu/exchweb/bin/redir.asp?URL=http://www.ianrpubs.unl.edu/epublic/live/g1675/build/g1675.pdf>

Agronomy Tips

Blunt Ear Syndrome....Again – (*Bob Nielsen*)

Like the swallows that return to San Juan Capistrano every year, reports of Blunt Ear Syndrome (BES) or Beer Can Ear Syndrome (BCES) have surfaced this past week. This form of arrested ear development was described in Colorado in 1989, was very prevalent across much of the Midwest in 1992, and has occurred in varying frequencies every year since.

The cause of this problem has never been conclusively determined. Some believe the occurrence of BES is associated with high soil pH or low-lying ponded areas of fields or herbicide injury. I personally lean toward the effects of a cold temperature shock during ear size determination that either directly injures ear shoot tissue or alters the hormonal balance within the developing ear shoot (Nielsen, 2001).

The accompanying images illustrate the classical symptoms associated with BES from a field I visited this past week. The affected ears were located primarily in the first 10 or so rows along the edge of a field and scattered throughout the remainder of the field; primarily in areas relatively lower in elevation than adjacent areas. I have often found BES in lower areas of the field (which would support my cold temperature theory), but I admit that that sometimes BES is restricted primarily to higher elevations within a field.

Ear size of affected ears is usually fairly normal at the base of the cob, but then the cob simply truncates abruptly. A rudimentary ear tip is usually visible at the end of the truncated cob and is reminiscent of what one would find in ear shoots dissected from plants at about the V9 stage of development. This latter symptom suggests to me that the stress that triggers the BES occurs during ear size determination (Nielsen, 2007a).

Plants with severe BES symptoms may turn purplish-red later in the grain filling period as anthocyanin pigments develop in response to the accumulation of photosynthetic sugars in the leaves and stalk because of the paucity of kernels on the cob. The purpling response is similar to that which often develops early in the growing season (Nielsen, 2008).

If You Find BES-Affected Fields

If you come across fields that exhibit these BES symptoms, please consider submitting some background information on those fields to an on-line database that may eventually help identify common threads among affected fields. The information I would like to receive is summarized below and the on-line database form is located at <http://www.zoomerang.com/Survey/?p=WEB22864Y5G52Y>. If you would rather send me the information by email, that would be fine also.

* State (location) of the affected field.
* Planting date of the affected field.
* Seed company (e.g., Bob's Pretty Good Hybrids)
* Hybrid number (e.g., BN2821)
* Approximate percent of field that is affected with BES.
* Approximate percent of ears affected with BES within the affected area.
* Average length (inches) of affected cobs.
* Average number of kernels per row on affected ears.
* Average number of kernel rows on affected ears.
* Soil pH levels of affected field.
* Other soil test information from affected field.
* General location of affected area within field (throughout, field edges, high ground, low ground, etc.).
* Relative soil drainage of affected area (well-drained, poorly drained, etc).
* Herbicides applied this year (product, rates, application times)
* Fungicides applied this year (including seed treatments)

Related References

Nielsen, R.L. (Bob). 2001. 'Beer Can' Ear Syndrome-2001. Corny News Network, Purdue Univ. [On-Line]. Available at <http://www.kingcorn.org/news/articles.01/Beer_Cans-0907.html>. [URL accessed 8/16/08].

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Nielsen, R.L. (Bob). 2008. Prevalent Purple Plants Possibly Puzzle Producers. Corny News Network, Purdue Univ. [On-line]. Available at <http://www.kingcorn.org/news/timeless/PurpleCorn.html>. [URL accessed 8/16/08].

Purdue Experts Leave N Detection To Optical Reflectance Sensors – (*Ag Answers*)

Contrary to what's been considered the gospel for years, in regards to nitrogen rate recommendations, Purdue University agronomists believe that the optimum nitrogen rate is strongly related to the soils' capacity to supply nitrogen.

The soils' ability to supply nitrogen is dependent on the amount of organic matter, drainage capability, rainfall, soil temperature, mineralization potential, leaching potential and denitrification potential, explained Jim Camberato, Purdue Extension soil fertility and plant nutrition specialist.

Camberato and Bob Nielsen, Purdue Extension corn management specialist, conducted trials over a two-year time span at seven Purdue research farms, 39 sites with a corn after soybean rotation and 18 sites with a corn after corn rotation.

"After conducting nitrogen rate trials in '06 and '07, we found the optimum nitrogen fertilizer rate is not strongly related to yield potential," Nielsen said. "Or it could be said that higher yielding fields don't necessarily require higher nitrogen fertilizer rates.

"There was however, an excellent relationship between relative yield in each field and the total nitrogen available to the crop, which is the nitrogen the soil supplies plus the fertilizer. In some cases more than half of the nitrogen supplied from the crop originated from the soil itself."

Camberato said when the new data is plotted out yield plateaus at about 275 lbs. per acre of soil plus fertilizer nitrogen.

"This means if we know how much nitrogen the soil supplies, we can subtract that amount from 275 and know how much additional nitrogen the plant actually needs," Camberato said. "But predicting the amount of nitrogen supplied by the soil is difficult."

The fact that the nitrogen cycle is dynamic, mineralization rates are hard to predict, rates of nitrogen loss are hard to predict and required weather data is hard or costly to obtain, all make it hard for a successful model to be developed, Camberato said.

Despite the challenges, Purdue University agronomist Brad Joern is working to develop a model that will estimate up-to-date mineralization and nitrogen loss variables.

Until then, optical reflectance sensors can be used to measure light reflectance from leafy crop canopies, which can be used to estimate the nitrogen status of plants and ultimately estimate how much additional nitrogen needs to be applied. Healthy, large plants reflect light differently than struggling, smaller plants and plants with adequate nitrogen reflect light differently than nitrogen deficient plants.

"Optical sensors helps us recognize and quantify differences in the nitrogen content of plants in areas of a field," Camberato said. "The nitrogen rate can be controlled manually or electronically to change application rates based on reflectance differences in a field."

There are two primary commercialized sensors in use in the United States, Crop Circle™ and GreenSeeker™ units, Nielsen said. Both units emit near infrared rays and visible light wavelengths.

Nielsen and Camberato said there are three rules to remember when working with optical reflectance sensors.

The first being optical sensor measurements and nitrogen content of corn relate best once the crop is well into its rapid growth phase, the V8 stage and beyond where approximately 60 percent of nitrogen uptake occurs. The uptake of nitrogen during the rapid growth phase is dramatic and differences in plant nitrogen levels become more evident to the human eye and especially to optical sensors.

"The down side of waiting to apply nitrogen after the V8 growth stage is that the corn plants are much taller, which limits the technology to operations that can apply fertilizer through irrigation water or with high clearance applicators," Camberato said.

Second, growers need to include a high-nitrogen reference strip for each hybrid in each field. These strips are used to help drive the predictive formulas for the sensors. Because hybrids vary naturally in their "greenness," the sensor will need to be recalibrated for each one, Camberato explained.

Third, not all low reflectance areas in a field are simply nitrogen deficient. Consequently, low reflectance areas within a field need to be carefully interpreted by the operator or the sidedress applicator if the intent is to vary nitrogen rates on a site-specific basis. It's important to keep in mind that not all low reflectance areas will be "no-brainers" like drowned out spots, Nielsen said.

Insects, Mites, And Nematodes

Black Light Trap Catch Report - (*John Obermeyer*)

	7/29/2008 - 8/4/2008							8/5/2008 - 8/11/2008						
County/Cooperator	**VC**	**BCW**	**ECB**	**SWCB**	**CEW**	**FAW**	**AW**	**VC**	**BCW**	**ECB**	**SWCB**	**CEW**	**FAW**	**AW**
Dubois/SIPAC Ag Center	0	1	4	1	0	0	1	0	0	0	0	0	0	0
Jennings/SEPAC Ag Center	0	0	7	20	0	0	0	0	0	1	0	0	0	0
Knox/SWPAC Ag Center	0	1	5	20	0	0	1	0	1	1	2	0	0	0
LaPorte/Pinney Ag Center	0	0	47	0	1	0	0	0	0	3	0	0	0	0
Lawrence/Feldun Ag Center	0	1	0	0	0	0	0	0	4	0	0	0	0	1
Randolph/Davis Ag Center	0	4	0	1	0	0	0	0	0	0	0	0	0	1
Tippecanoe/TPAC Ag Center	0	1	4	0	0	0	0	0	0	6	0	0	0	0
Whitley/NEPAC Ag Center	0	0	12	0	0	0	1							

VC = Variegated Cutworm, BCW = Black Cutworm, ECB = European Corn Borer, SWCB = Southwestern Corn Borer, CEW = Corn Earworm, FAW = Fall Armyworm, AW = Armyworm

Weather Update