Pest&Crop

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In This Issue

Insects, Mites, and Nematodes

Stalk Lodging and Postmortem Insect Damage Diagnosis – (*John Obermeyer, Rich Edwards, and Larry Bledsoe*)

- Downed corn likely caused by multiple factors
- Earlier insect root or stalk feeding may have contributed
- Rootworm feeding not easily discernable in rotted roots

Corn is lodging in many areas of the state especially where gusty winds were coupled with recent weather fronts. As most know, some fields are flat! If it is any comfort, this is happening in many areas of neighboring states as well. University and industry specialists have been suggesting many plausible reasons for this phenomena, including diseases, insects, and stress during ear fill.

Insect feeding, i.e., corn borer and rootworm, earlier in the season may have predisposed the plant to various pathogens which has led to stalk rots. As well, insect damage may further stress a plant during the critical ear fill stage causing the plant to rob carbohydrates from the stalk. However, considering the extent and severity of the plant lodging, it is doubtful that insects are the key culprit. Paul Vincelli, University of Kentucky plant pathologist offers his insight in the *Kentucky Pest News*, "Stalk rot diseases are the result of opportunistic infections. What this means is that certain stress factors, such as low carbohydrate status in the stalk, predispose the plant to infection, and the "first one to attack, wins"; that is, the first fungus to infect the stalk is the one that causes the stalk weakening. What this also means is that the most important thing to do from a production standpoint when stalk rots attack is to evaluate one's cultural program and see if there are particular agronomic stresses that might be alleviated. Factors that might enhance stalk rot problems include: excessive plant population, excessive N^+ in relation to potash, high N^+ levels early in the season followed by N^+ loss through leaching or denitrification, inadequate levels of potash, low stalk strength ratings of hybrids planted, and severe leaf disease. Producers may wish to evaluate these factors to see if there are ways to reduce the risk of stalk lodging in future years."

We have been receiving corn root samples of these lodged plants and being asked to evaluate them for rootworm damage. Two weeks ago we could give a fair diagnosis on whether rootworm may have contributed to lodging. Now samples being submitted are too far advanced in decay. Bottom line: too late for rootworm analysis, corn borer damage by stalk splitting can still be evaluated.

Managing Winter Annual Weeds, Are Fall Herbicide Treatments Necessary? – (*Mark Loux and Jeff Stachler, The Ohio State University*) -

Populations of winter annual weeds seem to have been at an all time high over the past several years. Weeds such as common chickweed, henbit, purple (or red) deadnettle, and marestail (horseweed) have been difficult to manage in the spring in some fields, and have interfered with tillage, and crop establishment and earlyseason growth. A major complaint about chickweed is that it keeps soil from drying in the spring. Winter annuals can also harbor insects and possibly soybean cyst nematode. Will the fall/winter of 2000 and 2001 provide us with yet another bumper crop of winter annuals? At this point in time, we would have to say yes. We have already observed winter annuals in a number of fields, and relatively wet conditions should promote emergence and growth. Some questions and answers follow to help you sort through management strategies for winter annuals:

1) What is the life cycle of winter annual weeds? Chickweed, deadnettle, mustards, and most other winter annual weeds emerge in the fall, survive the winter with little or no further growth, resume growth in late winter or early spring, and flower and go to seed in late spring or early summer. However, some winter annuals can demonstrate summer annual weed characteristics under certain environmental conditions. We have occasionally observed mustard and marestail emerging with the foxtail, lambsquarters and other summer annual weeds over the month or so following corn or soybean planting. The growing season of 2000 provides a good example of the ability of marestail to emerge over much of the year. When chickweed gets an early start in late summer, it may set seed in late fall or early winter.

2) Why have winter annuals populations increased? Several factors may have caused the increase in winter annual weeds. Most winter annuals emerge in the fall, and the warm weather in late fall during the past several years has resulted in higher populations. Warm weather in late winter of 2000 also promoted growth of winter annuals that had emerged the previous fall. Winter annuals have been more of a problem in the southern half of Ohio, and we assume this is due to warmer soil temperatures later in the fall compared to farther north. No tillage tends to promote winter annual populations, since there is no tillage in fall to disrupt their emergence. However, winter annuals can emerge after an early fall tillage, and have been a problem in tilled as well as notill fields. Early soybean harvest in 1999 allowed earlier than typical fall tillage in some fields, providing a window after tillage for winter annual emergence. Another factor may be the switch from preplant/preemergence herbicide programs (Squadron, Canopy etc.) to Roundup Ready and other postemergence programs, since we have observed winter annual weed problems showing up more often following postemergence programs. If so, this may indicate that the preplant herbicides are either: 1) preventing seed production by these weeds in the spring, or 2) persisting into the fall at rates that are high enough to reduce winter annual emergence. Continued problems with winter annuals may warrant reconsideration of the utility of total postemergence programs.

3) Can winter annuals be controlled with spring burndown treatments? Yes, but control is often more variable and more difficult than in fall, due to weed size and weather conditions. Herbicides are more active under the warmer temperatures in late spring, but winter annuals should probably be controlled in early spring to allow maximum time for soil drying and herbicide activity that can be very slow. Because they generally are completing their life cycle in late spring, one management strategy when winter annual populations are low is to till or apply burndown herbicides around the time of planting, and plant the crop regardless of how effective the tillage/herbicides were on the weeds. This can be an adequate strategy, since the winter annuals are most likely reduced in vigor and are unlikely to interfere with early crop establishment. However, as crop planting is moved earlier and winter annuals increase in density and size, a more aggressive management strategy will be needed and fall or early spring applications should be considered.

4) How effective are fall treatments? In general, herbicide treatments or tillage in late fall (November) seem to be much more consistently effective than spring treatments, especially in dense stands of winter annuals. Weeds are smaller and more susceptible to herbicides in the fall, and weather may be more conducive for herbicide activity. Soil conditions may also be better suited to sprayer traffic.

We conducted research at three sites in 1999/2000, with a number of fall and spring applied herbicide treatments. Fall treatments were applied in mid November, and spring treatments in mid to late March. One site had a dense chickweed population and the other two had moderate to dense populations of purple deadnettle. Most treatments included 2,4D amine, but it contributed essentially no control of chickweed and poor control of dead nettle (but 2,4D ester is cheap enough that it should probably be included in any treatment of this type). Results varied by weed species, making it somewhat difficult to develop a single management strategy for both weeds.

Fall treatments providing at least 90% control of chickweed included Steel, Command, glyphosate (1 pint), and Banvel (1 pint). Note: Command are not currently labeled for fall application. Fall applied Sencor and Sencor+Python combinations were more variable, with control ranging from about 60 to 80% depending upon rate (the 8 oz rate of Sencor provided close to 80% control). Spring treatments providing the most effective control included glyphosate (94%), Gramoxone (80%), and Sencor (74%).

Control of deadnettle varied by site and size of the weeds at the time of application. Plants were considerably smaller in the spring at our site near South Charleston (1 inch), compared to our site near Amanda (6 inches). At South Charleston, fall application of Python+Sencor, Canopy (2 or 4 oz), Steel, Command, Sencor (8 oz), or glyphosate provided good to excellent control (although Sencor was somewhat more variable than the other treatments). At Amanda, good to excellent control occurred with fallapplied Canopy (4 oz), Command, or Sencor (8 oz). Fall applied glyphosate and lower rates of Canopy and Sencor were more variable at Amanda, but still provided at least 80% control. For spring treatments at South Charleston, adequate control resulted from Sencor (98%), Canopy (89%), or Python+Sencor (88%). At Amanda, the most effective spring applied control was 79% with Sencor or Canopy. Gramoxone applied in the spring provided some control at both locations (59 to 69%). Glyphosate was much less effective in the spring than in the fall for deadnettle control.

We did not include Canopy XL in these studies it apparently has excellent activity on deadnettle and star of Bethlehem but no activity on chickweed. Dupont has data showing good chickweed control with mixtures of Canopy or Canopy XL with low rates of Express in the fall. We also did not test Princep, but a fall treatment of Princep + 2,4D should be fairly effective on a number of species where corn will be planted next spring. Our standard rate of glyphosate in these studies was 1 pint/A, and control of deadnettle may be improved with higher rates (Monsanto recommends at least 1-1/2 pints/A for fall control of winter annuals).

5) Fall herbicide recommendations for a mixture of winter annual speciesWe assume that a number of fields will have both chickweed and deadnettle. Fall application of glyphosate + 2,4D, where the glyphosate rate is at least 1-1/2 pints/A, should be effective except possibly where deadnettle is more than a few inches tall. Where winter annuals are less than a few inches tall, application of Sencor or Gramoxone plus 2,4D may be sufficient. Our data seem to show little benefit to Python/Sencor mixtures, compared to 8 oz/A of Sencor alone. For control of larger plants,combinations of Sencor or Canopy/Canopy XL plus Gramoxone or glyphosate (with 2,4D) should also provide broadspectrum control. Herbicides should be applied with surfactant or crop oil to maximize activity.

6) Will fall treatments eliminate the need for a spring burndown treatment?A latefall herbicide treatment that controls all of the weeds present at that time should often provide near complete winter annual control through spring crop planting, regardless of whether the herbicide(s) has residual activity. Some emergence of winter annuals can occur in spring, but this seems to be minimal. However, a number of other weeds can emerge in early spring and reach considerable size by planting, including ragweeds, smartweed, atriplex spp, quackgrass, and Canada thistle. If any of these weeds are present in the spring, a burndown treatment should be applied at or before planting. Where Roundup Ready soybeans are planted, glyphosate could be applied after planting if earlyemerging weeds are not too large. Weeds that emerge in early spring should not be allowed to coexist with soybeans until the time of a typical postmergence treatment (4 weeks after planting), or yield loss may occur. In nonRoundup Ready soybeans, fall applications of herbicides with residual (Canopy, Canopy XL, Scepter, etc.) may provide sufficient control to avoid the need for a burndown treatment at planting, but fields should be scouted at that time to make sure weeds are not present. Weeds that emerge in early spring can be extremely difficult to control with postemergence herbicides in nonRoundup Ready soybeans.

Plant Diseases

Disease Risks for Soybeans – (*Gregory Shaner*) –

• Risks of planting continuous soybeans

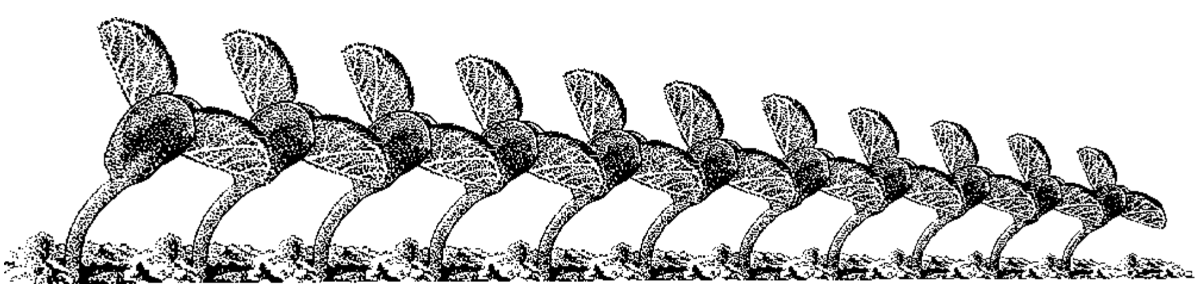
Some economists are suggesting that farmers in Indiana plant more soybeans next year, and less corn. This advice is based on projected commodity prices, supplies, production costs, and government payments to farmers. There are now about as many acres of soybeans in Indiana as of corn. Therefore, if there is a substantial shift to more soybean planting relative to corn, a lot of soybeans will be planted in 2001 on ground that was planted to soybeans this year. Regardless of the economic pros and cons of making this change in cropping practice, there are disease consequences that could be seen next year and for many years to come in fields that are continuously cropped to soybeans.

Most of the important diseases of soybean in Indiana are caused by organisms that reside in the soil: soybean cyst nematode, Phytophthora rot, sudden death syndrome, white mold, and brown stem rot. Because these pathogens are soilborne, they are not capable of rapid dissemination from field to field. The severity of these diseases depends greatly on crop production practices in a field. Other things being equal, the more frequently soybeans are grown in a field, the more likely one or more of these diseases is to be a serious problem.

Currently, much of Indiana's field crop acreage is in a corn-soybean rotation. The pathogens that cause the diseases listed above can survive in fairly high numbers during the year in which corn is grown. This is why we have seen a general increase in problems with most of these diseases over the past 20 years, as farmers have shifted from longer rotations to the corn-soybean rotation.

Growing successive soybean crops in the same field could greatly aggravate disease problems. During 1998, sudden death syndrome was epidemic in much of Indiana (and in other states as well). Many fields that were in soybeans during 1998 are in soybeans this year, and once again, we are seeing a lot of sudden death syndrome. Reports are starting to come in about white mold in northern parts of the state. Damage from soybean cyst nematode is widespread. Phytophthora rot is a widespread problem. When these diseases are severe, we know that the pathogens are multiplying, and their numbers at the end of the season will be much larger than they were last spring. These pathogens will survive the winter, and be ready to infect soybeans next spring if that crop is sown back into these fields. At this stage, it is impossible to say with certainty whether any particular disease will be a problem next year, because weather has an important influence. But, we can say that in fields where disease was severe this year, there will be even more inoculum ready to infect soybeans next year if weather conditions are favorable.

In conclusion, if growers do consider going back into fields with soybeans in 2001 that were in soybeans this year, they should factor in the possible influence of disease on next year's crop. If a field had disease problems this year, it could be very risky to plant soybeans again next spring. If a field had some disease this year, but not severe, going back into soybeans next year could lead to a further buildup of one or more pathogens, leading to problems in future years. If a grower contemplates going back into a field with soybeans that has soybeans in it this year, it would be a good idea to have the soil tested for soybean cyst nematodes, and then to use an SCN-resistant variety if appropriate. Use of soybean varieties with resistance to Phytophthora rot would also be advisable. Knowledge of the history of specific disease problems in a field should is important for making sound planting decisions for 2001.



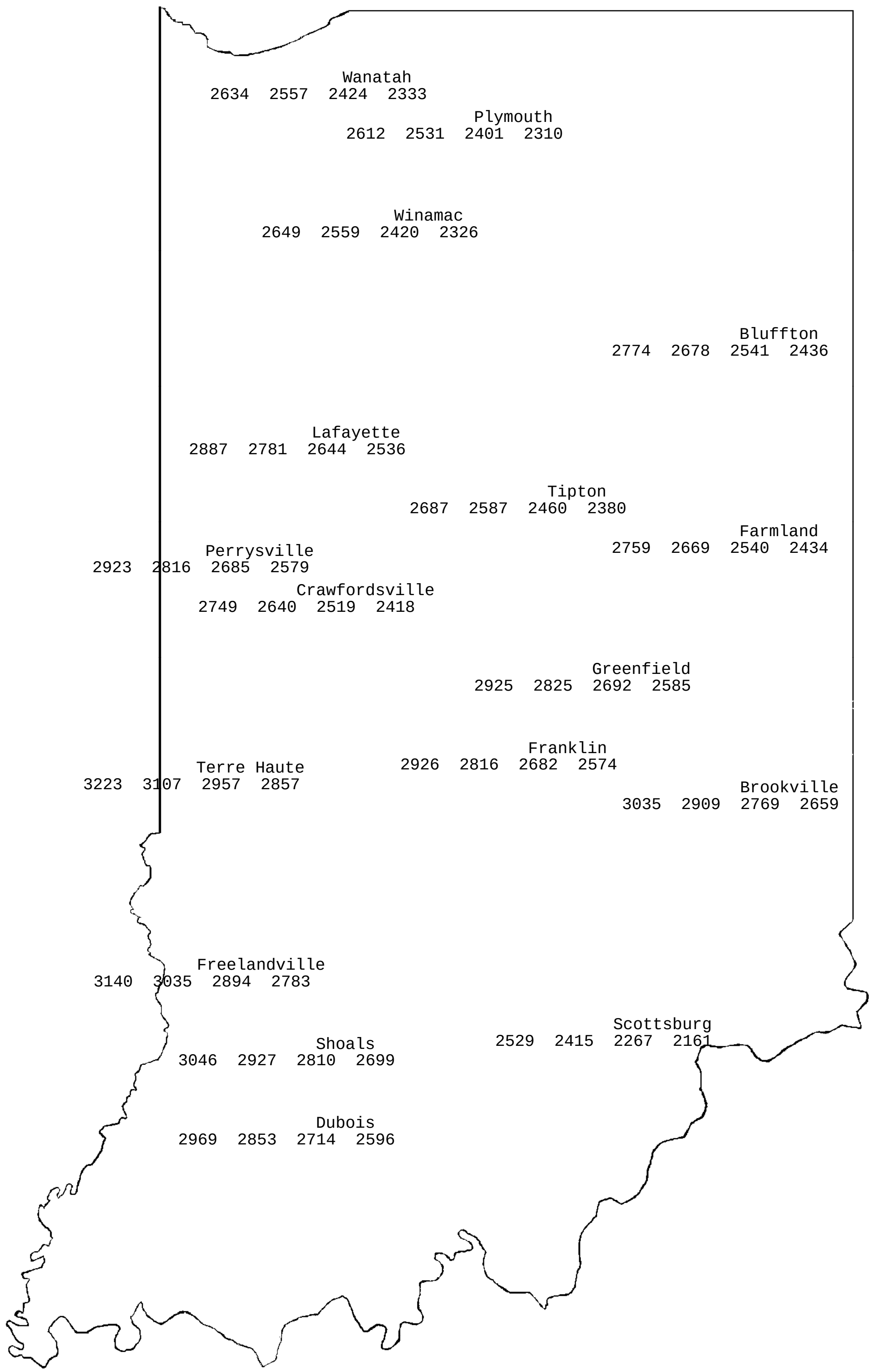
Weather Update

MAP KEY

Location
GDD(4) GDD(10) GDD(60) GDD(90)

Temperature Accumulations from Jan. 1 to September 27, 2000

GDD(4) = Growing Degree Days from April 14 (4% of Indiana's corn planted), for corn growth and development
GDD(10) = Growing Degree Days from May 1 (10% of Indiana's corn planted), for corn growth and development
GDD(60) = Growing Degree Days from May 5 (60% of Indiana's corn planted), for corn growth and development
GDD(90) = Growing Degree Days from May 12 (90% of Indiana's corn planted), for corn growth and development



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Extension Entomology Office
Department of Entomology
Purdue University
1158 Smith Hall
West Lafayette, IN 47907-1158

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Bug Scout

The corn row is over here, I think!

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