Pest & Crop

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In This Issue

Insects, Mites, and Nematodes

Don't Neglect Alfalfa Fields – (*John Obermeyer and Larry Bledsoe*)

- Scout alfalfa NOW for weevil damage!!!
- Warm temperatures have accelerated larval development and activity.
- Use highest rate of labeled insecticide for longest possible residual control.
- If a second application is necessary, adhere to product rate and harvest restrictions.

Alfalfa fields in southern and central Indiana need to be inspected immediately for weevil tip feeding and skeletonization of leaves. Three southern Indiana Purdue Agricultural Centers have reported 12, 32, and 87% tip feeding this past week in fields being regularly monitored (thanks to Don Biehle, Richard Huntrolds, and Frankie Lam). Betsy Smith, Grower's Co-op, out of Terre Haute informed us that 8 out of 10 fields being scouted in her area have reached the treatment threshold.

Last fall and winter's relatively mild temperatures have obviously allowed for successful egg and adult over-wintering. The high variability in numbers and size of larvae seen this spring, also indicate that egg laying occurred over an extended period, and that larvae will be present longer than normal. Unfortunately, unless beneficial organisms (both parasitic wasps and pathogenic fungi) begin to really kick into gear, some fields may need to be treated more than once. Should this be the case, be certain to adhere to rate-use and pre-harvest restrictions.

Our management guidelines at this time for southern Indiana suggest that fields be treated when there are 3 or more larvae per stem and tip feeding is at least about 50%. Most insecticide labels suggest using higher rates for increased residual control, we concur with this recommendation. Refer to management guidelines and recommended insecticides for alfalfa weevil in last week's *Pest&Crop*.

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Raining Black Cutworm Moths - (*John Obermeyer and Larry Bledsoe*)

- Recent fronts have brought us many black cutworm moths.
- Timing of scouting can be improved by tracking heat unit accumulations.
- Scouting fields and treating when necessary makes more sense than the preventative applications of insecticides.
- Don't rely on insecticide-treated seed to prevent economic damage.

Most of our dutiful trapping cooperators throughout the state captured black cutworm moths this past week, including three intensive captures (9 or more moths caught over 2-nights). This recent flush of moths is attributed to warm wind currents from the Gulf Coast States and southwestern portions of the country.

Significant moth captures at this time, along with the use of heat units to predict the beginning of larval activity, gives us an indication of potential severity of the problem and locations of concern. Thus, we are able to predict with some degree of accuracy when and where crop damage is likely to occur based on these data. Refer to the "Weather Update" in future issues of the *Pest&Crop* as we track heat unit accumulations and predicted damage in your area.

Should one treat for black cutworm before or at planting? Because of the sporadic outbreak nature of this pest, the tried, true, and economic approach to black cutworm management is to scout fields, determine infestation and damage levels, and use a rescue treatment, if needed. Producers using insecticide-treated seed may have a false sense of security concerning black cutworm control. Certainly the systemic activity of these newer insecticides during the seedling stage should help suppress small larvae feeding on plants. However, fields attracting egg-laying moths during multiple flights will likely experience significant damage and stand losses.

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Armyworm Moths Also Arriving - (*John Obermeyer and Larry Bledsoe*)

Armyworm pheromone traps in Kentucky and two black light traps in Indiana (thanks Todd Hutson and Frankie Lam) have confirmed that this pest from the "memorable" 2001 season has made its annual arrival into the Midwest, albeit numbers are low at this time. Watch for our black light trap catch reports in future *Pest&Crop* newsletters.

Black Cutworm Adult Pheromone Trap Report
Week 1 = 4/8/04 - 4/14/04 Week 2 = 4/15/04 - 4/21/04

County	Cooperator	BCW Trapped	
		Wk 1	Wk 2
Adams	Roe/Price Ag Services	0	7
Allen	Gynn/South Wind Farm	0	2
Benton	Babcock/Jasper Co. Co-op	0	2
Clay	Smith/Growers Co-op (Brazil)	0	5
Clay	Smith/Growers Co-op (Clay City)	2	5
Elkhart	Kauffman/Crop Tech Inc.	0	0
Fayette	Schelle/Spring Valley Farms	2	1
Fountain	Hutson/Purdue CES	-	0
Fountain	Mroczkiewica/Syngenta	0	6
Gibson	Hirsch Farms	0	2
Greene	Maruszewski/Worthington Pioneer	0	2
Johnson	Kessler/Ag Excel	-	-
Knox	Smith/Growers Co-op (Fritchton)	0	3
Knox	Smith/Growers Co-op (Oaktown)	0	0
Lake	Kliene Farms (1)	0	3
Lake	Kliene Farms (2)	0	4
Marshall	Barry/Fulton-Marshall Co-op	-	4
Marshall	Shanks/Plymouth Pioneer (1)	0	0
Marshall	Shanks/Plymouth Pioneer (2)	0	0
Marshall	Shanks/Plymouth Pioneer (3)	0	0
Newton	Babcock/Jasper Co. Co-op	6	2
Putnam	Nicholson Consulting	1	9
Randolph	Boyer/Davis-Purdue Ag Center	0	0
Randolph	Derek Calhoun	3	1
Rush	Tacheny/Pioneer Hi-Bred	3	18*
Shelby	Gabbard/Shelby Co. CES	13*	3
Sullivan	Smith/Growers Co-op (New Lebanon)	1	4
Sullivan	Smith/Growers Co-op (Sullivan E)	3	9*
Sullivan	Smith/Growers Co-op (Sullivan W)	3	7
Tippecanoe	Obermeyer/Purdue CES	1	13*
Tipton	Johnson/Pioneer	0	0
Vermillion	Hutson/Purdue CES	-	1
Vigo	Smith/Growers Co-op (Terre Haute)	6	5
Warren	Babcock/Jasper Co. Co-op	2	6
White	Reynolds/Vogel Popcorn	2	5
Whitley	Walker/NE-Purdue Ag Center	0	1

* = Intensive Capture... an intensive capture occurs when 9 or more moths are caught over a 2-night period.

Folicur Approved for Use Against Wheat Head Scab - (*Gregory Shaner*)

The US Environmental Protection Agency has granted a Section 18 Specific Exemption for use of Folicur 3.6 F fungicide for suppression of *Fusarium* head blight (scab) of wheat. This Section 18 registration allows use of Folicur on wheat up to the beginning of flowering (Feekes growth stage 10.51), and is valid for the period April 15 through June 30, 2004. Users of this fungicide must have a copy of the label in their possession at the time of pesticide application. Copies of the label can be obtained at County Extension Offices.

Fusarium head blight harms wheat in three ways. It reduces yield and test weight. Also, the fungus that causes scab (primarily *Fusarium graminearum* in the Corn Belt) produces a toxin in grain. This toxin, variously termed deoxynivalenol, DON, or vomitoxin, is chemically stable and persists through milling and baking. The FDA recommends that finished wheat products contain no more than 1 ppm of DON. Last year, wheat from many fields in southern Indiana and Illinois and down into the southeastern US contained DON levels of 8 to 10 ppm. Folicur may help reduce these problems in the future.

Researchers have been conducting uniform fungicide trials for control of *Fusarium* head blight in wheat and barley for several years. While Folicur does not provide complete control, it has been among the best of the materials tested for suppression of head blight and reduction of DON in grain. Results from many uniform trials indicate that proper use of this fungicide can reduce symptom severity and DON levels by about 30% in winter wheat.

Development of *Fusarium* head blight depends on weather. Basically, wet conditions from about a week before flowering through the end of flowering are conducive for disease development. So, if a grower has wet, humid conditions for the week before flowering, use of Folicur may be justified. Another predisposing condition for development of *Fusarium* head blight is corn residue in a wheat field. *Fusarium graminearum* is a common stalk rot fungus in corn. Even though a previous crop of corn may not have had a problem with stalk rot, the fungus will be present in the stalks. When weather is favorable in the spring, the fungus produces spores on the corn residue and these can infect wheat. Spores of *F. graminearum* can also infect wheat planted into ground that has no corn residue because they are airborne and can travel from field to field. However, the risk of disease is greater if the source of the spores (corn residue) is within the wheat field. There is now available a weather-based disease risk model for *Fusarium* head blight (see companion article). Growers can use this to help decide whether to use a fungicide.

Folicur can be applied by ground or aerial sprayers. The label provides information on spray volume, use of surfactants, pre-harvest interval restrictions, and restrictions on use of straw for bedding. To achieve the best performance with Folicur, it is important to get as much fungicide as possible on the wheat head (spraying wheat before heads have emerged will provide no control of *Fusarium* head blight). Most spray systems are designed to place material on foliage, which is essentially a horizontal surface. Spraying heads requires depositing fungicide on a vertical surface. Based on results from the uniform fungicide trials, the most effective nozzle configuration is to use a pair of XR8001 flat fan nozzles at each nozzle body location on the boom, one oriented forward and the other backward, at about 45∞ from vertical. As the sprayer moves through the field this directs spray to the front and back of each head relative to sprayer travel direction. Single TwinJet TJ8002 nozzles will also deliver spray effectively to heads.

Dr. Don Hershman, an extension plant pathologist at the University of Kentucky, states that for aerial application of Folicur, nozzles should be angled to direct spray 90° to the direction of travel. Spray droplets should be from 300 to 400 micrometers (microns) in diameter. The Folicur label specifies that spray volume for aerial application should be at least 5 gal / A. Spraying in early morning, when dew is still on plants, will promote better fungicide coverage on heads.

Results from the uniform fungicide tests indicate that spraying wheat at the beginning of flowering (Feekes 10.51) provides the best suppression of head blight. The beginning of flowering is when wheat first becomes vulnerable to infection. This stage of growth can be recognized by the presence of anthers just above the middle of the head. Anthers are pale yellow, tubular structures that contain pollen. If application is delayed, infection may have already occurred and disease suppression will not be satisfactory.

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A Risk Model for *Fusarium* Head Blight of Wheat is Up and Running - (*Gregory Shaner*)

For the past 4 years, plant pathologists in North Dakota, South Dakota, Indiana, Ohio, and Pennsylvania have conducted research on the epidemiology of *Fusarium* head blight (scab) of wheat with the goal of developing a weather-based forecast for the disease. Dr. Erick De Wolf, a plant pathologist at The Pennsylvania State University, his graduate students, and colleagues

in other states (particularly Ohio) have crunched a lot of data and developed a risk model for *Fusarium* head blight. Much like a weather forecast, it predicts the probability of an event, in this case an epidemic of head blight. An epidemic is defined as a severity of at least 10% in the field. This means that 10% of the heads are completely blighted, or that 20% of the heads are 50% blighted, and so forth.

As briefly discussed in the companion article about Folicur 3.6 F fungicide for suppression of head blight, weather has a strong influence on development of this disease. Even though the fungus that causes head blight (*Fusarium graminearum*) is ubiquitous in corn residue, if weather is unfavorable for spore production or infection there will be little or no disease. Conversely, if weather is favorable, a major outbreak of head blight will occur, often over a large area. Last year, head blight was common in southern Indiana and Illinois, and extending down to the southeastern US.

The model can be accessed via the Web. The url is <www.wheatscab.psu.edu/>.

From this homepage, a user can find some background information about *Fusarium* head blight and the model. The model itself is easy to use. Select the Risk Map Tool and answer a couple of questions. The model uses real time weather data for 7 days prior to wheat flowering. The user specifies the flowering date and then chooses the model for spring wheat or winter wheat. Indiana users would select winter wheat. When winter wheat is selected, an additional choice is offered: whether or not there is corn residue. This question refers to whether there is corn residue in the wheat field itself. In developing the model it became clear that for winter wheat it made a difference in the accuracy of prediction whether corn residue was present or not, so this factor was included in the model. For given weather conditions, the risk of head blight is greater for wheat planted into corn residue than for wheat on clean ground on in residue of some other crop.

The next screen displays a US map. The model can be used for states depicted in green. When the user chooses a state, a closer view is displayed on the screen, and there are purple dots that designate the locations of hourly weather stations (the risk model uses hourly data rather than the standard daily weather data that is collected at many sites around the country). The user can choose a weather station nearest his or her wheat field. Clicking on this dot will show the risk for that location, and will show a color-coded risk map for the states displayed on the screen. Red, yellow, and green indicate areas of high, moderate, and low risk, respectively. As I have been working with the model, I find that some stations within a "red" area show a low risk, so it's a good idea for a user to look both at the map and the risk assessment for a station near his or her field.

Because the model uses real time weather data, not predicted weather data, it can only be run for the current day or some earlier day. For example, if a user's wheat field flowered today, the model could be run for today's date to indicate the risk of head blight in that field. However, this would be the same day that Folicur should be applied if a grower were using the model to help determine whether a fungicide would be warranted. This can present some timing problems—running the model the same day that one would want to schedule treatment. A user could start using the model once wheat has headed (See *Pest & Crop* Issue No. 2 for a detailed discussion of wheat growth stages). Normally, wheat begins flowering a day or two after heads are fully emerged. Using the date of full head emergence as the "flowering date" for the model would give some idea as to the favorability of weather for head blight. If the model predicted a high risk for a "flowering date" that was actually 1 or perhaps 2 days before actual flowering, it is likely that the risk would not change dramatically by the time wheat actually flowered.

This model has just been launched and it is not foolproof. It is expected to have a prediction accuracy of about 80%. Additional research and the experience from making the model generally available this year will permit refinement in the future. The risk model will be a helpful tool in deciding whether to use Folicur fungicide (see companion article). Whether or not a fungicide is used, the model may also help in making marketing decisions. Grain buyers and processors should find it useful for indicating whether there may be problems in finding sources of sound wheat.

Agronomy Tips

Dry Topsoil Concerns Some Corn Growers – *(Bob Nielsen)*

Corn planting in the ~~Hoosier~~ Boilermaker state is off to the races with 15% of the state's crop acreage already in the ground, well ahead of the five-year average of 5% (Indiana Ag. Stats. Service, 4/19/04) and ahead of the previous record pace (8%) set in 1976. Three reasons for the early rapid rate of corn planting are dry soils, warm soil temperatures (relative to early April), and short-term memories of last year's wet May that delayed some corn planting until early June.

Some of the regulars at the Chat 'n Chew Cafe are beginning to fuss about the dryness of the soil, especially topsoil moisture. As of 18 April, 31% of the state's topsoil moisture was in fact rated as short to very short (Indiana Ag. Stats. Service, 4/19/04). Thunderstorms rolling through Indiana this week are replenishing soil moisture in some, but not all, areas of the state.

One of the concerns when surface soils are dry is the increased risk of injury to corn germination or to young corn seedlings from pre-plant anhydrous ammonia applications. Such injury is caused by desiccation of belowground plant parts that come into contact with the ammonia zone. Symptoms of anhydrous injury include poor or weak germination, discolored kernels, wilted seedlings, and brown stubbed-off roots. Shallow injection depths (less than 7 – 8 inches), coarse-textured soils, and dry surface soils (especially cloddy soils) all increase the risk of ammonia movement farther than normal from the point of injection (Sawyer, 2000) and thus the risk of injury to corn germination and young corn seedlings.

Another concern related to dry surface soils is whether soil moisture at the seed zone is uniformly adequate for germination. Uneven soil moisture in the seed zone is the primary cause of uneven emergence, the results of can easily reduce yield potential by 6 to 9 percent (Carter et. al., 2002). Under normal conditions, seeding depths of 1 1/2 to 2 inches are usually sufficient to achieve uniform soil moisture in the seed zone. Seeding depth decisions when surface soils are on the dry side may require planting as deep as 2 1/2 to 3 inches if necessary to achieve uniformly moist seedbed conditions, especially when the short-term weather forecast is not promising any significant rainfall. The key factor when faced with dry surface soils is taking the time DURING planting to visually inspect the soil moisture levels at the seed zone and change planter depth settings accordingly to best ensure placement of seeds into a uniformly moist seedbed.

References:

Carter, Paul, Emerson Nafziger, and Joe Lauer. 2002. Uneven Emergence in Corn. North Central Regional Extension Publication No. 344. Available online at <http://cecommerce.uwex.edu/pdfs/NCR344.PDF>. (Verified 4/21/04).

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Sawyer, John. 2000. Anhydrous application and dry soils. Integrated Crop Mgmt. Newsletter, Iowa State Univ. Available online at <www.ipm.iastate.edu/ipm/icm/2000/10-23-2000/anhydrous.html>. (Verified 4/19/04).

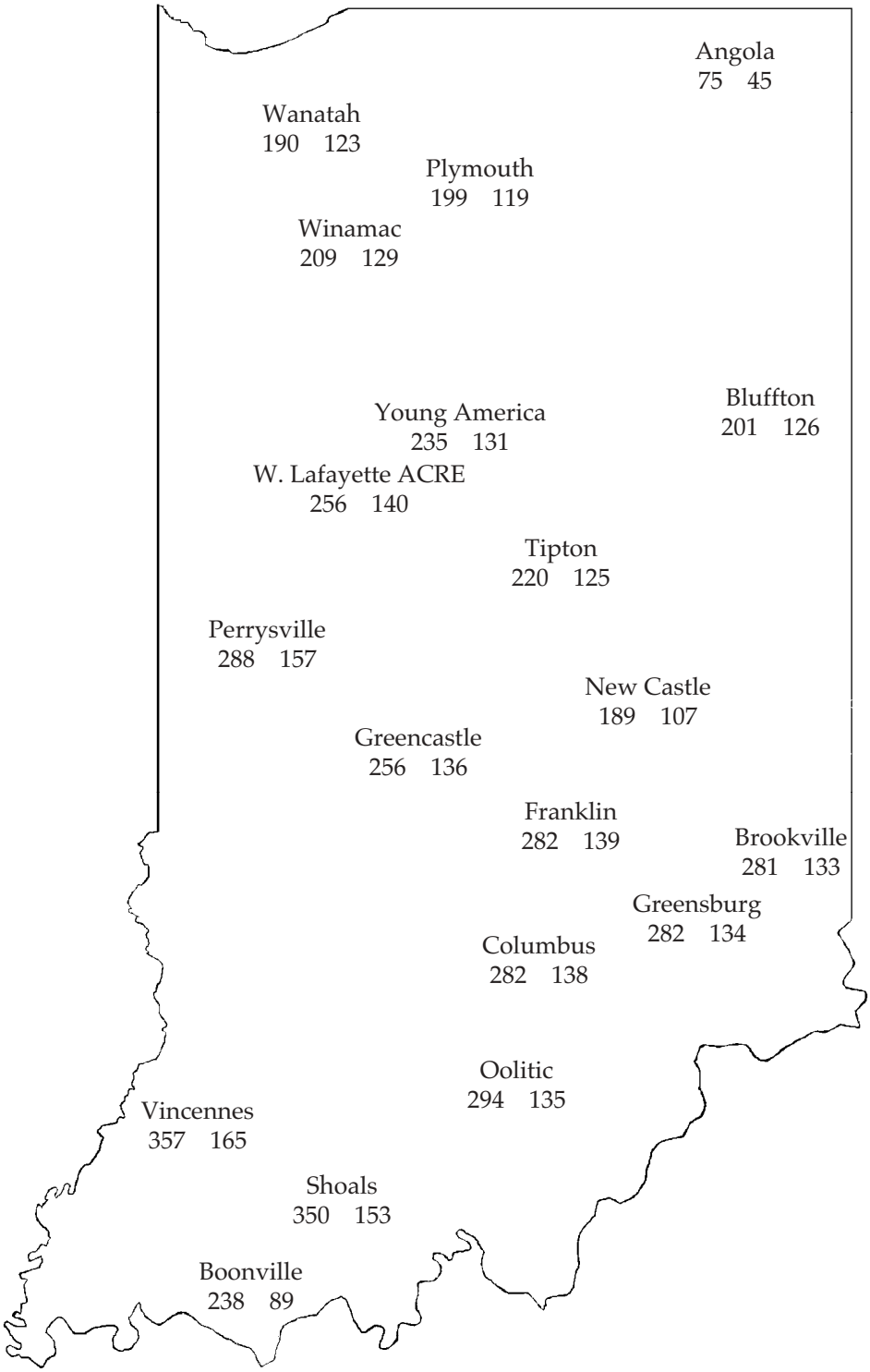
Don't forget, this and other timely information about corn can be viewed at the Chat 'n Chew CafÈ on the Web at <www.kingcorn.org/cafe>. For other information about corn, take a look at the Corn Growers' Guidebook on the Web at <www.kingcorn.org>.

Weather Update

Temperatures as of April 21, 2004

HU48 = heat units at a 48°F base from Jan. 1, for alfalfa weevil development (begin scouting at 200)
GDD(5) = Growing Degree Days from April 7 (5% of Indiana's corn planted), for corn growth and development

MAP KEY
Location HU48 GDD(5)



4" Bare Soil Temperatures 4/21/04

Location	Max.	Min.
Wanatah	57	53
Winamac	56	57
Chalmers	61	59
Bluffton	58	56
W Laf Agro	56	62
Tipton	57	56
Perrysville	60	60
Crawfordsville	54	52
Oolitic	65	58
Dubois	70	59

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