Pest & Crop

September 13, 2002 - No. 25

In This Issue

Insects, Mites, and Nematodes

Hessian Fly Infestation Should be Monitored This Fall Even Though Populations Remained Low in Indiana Wheat in 2002 – (*Sue Cambron*) -

- Planting after the fly-free date is a key management strategy for reducing Hessian fly problems
- Highest levels of infestation generally occur in Southwest Indiana

Hessian fly infestation was low in wheat trials sampled in Indiana in 2002, however, precautions should be taken to minimize the establishment of the fly in plantings this fall. The Hessian fly is present in wheat-growing areas throughout Indiana and often survives, although in lower numbers, in wheat stubble or grasses during the summer. However, there is potential for rapid increase of fly populations as a result of weather conditions or cropping practices that favor survival of eggs and young larvae in the fall.

Insecticidal control of the fly once infestation has occurred is poor, and generally not economically feasible. Management practices that prevent or delay build-up of fly populations, such as planting of resistant varieties and seeding after the fly-free date, provide the most cost effective means of control for wheat growers.

Much of the fall fly population can be avoided by planting after the fly-free date. This is key to avoiding subsequent infestation by the spring brood. Additionally, it has been shown that following the fly-free date will help reduce wheat disease problems and reduce winter kill from excessive growth. To determine the fly-free date for your area of the state, refer to the following map. Crop rotation, where wheat following wheat is avoided, also is one of the key management strategies for reducing Hessian fly problems. The Hessian fly passes the summer in the stubble of the current wheat crop. Plowing the stubble results in the destruction of the pest.

Volunteer wheat, the wheat seedlings sprouting in the fall from grain left in the field during threshing, germinates and begins growing just in time for the fall emergence of the Hessian fly. These plants are readily infested resulting in a rapid build-up of the population. The use of resistant varieties, in combination with the above pest management strategies, increases the chance for a fly-free crop.

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Barley Yellow Dwarf Virus Infection at a Record Level High in Indiana Small Grains in 2002 - (*Sue Cambron*) -

Barley Yellow Dwarf Virus infection, which is vectored by aphids, was at a 20 year high during the 2001-2002 growing season. The mild fall led to a high aphid population, and a longer time for feeding and transmission of the virus. There are few oat or wheat cultivars that offer good resistance to the virus.

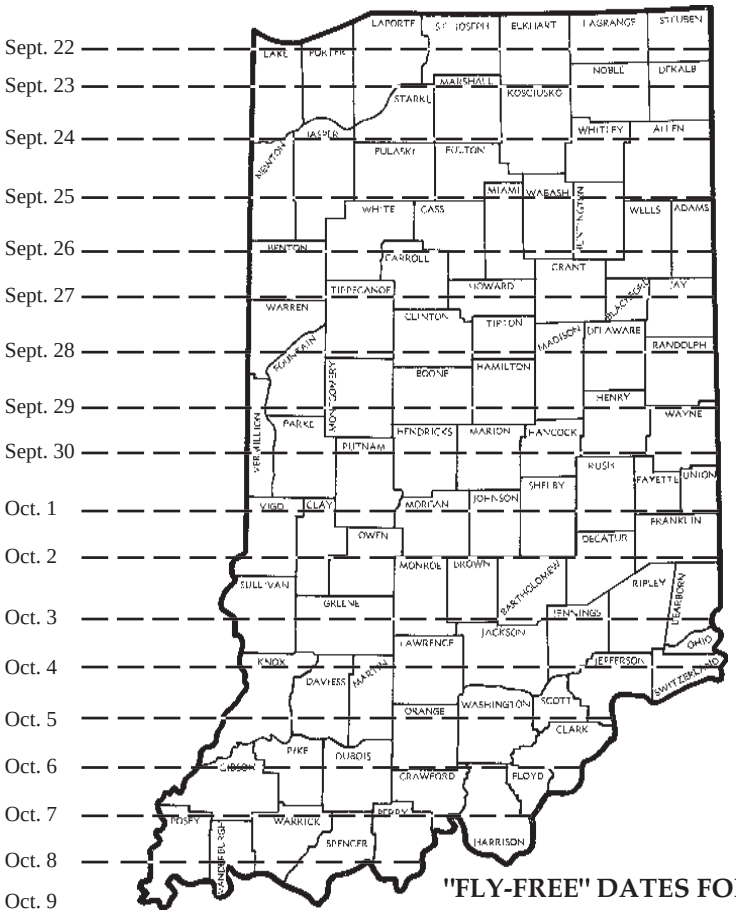
Specific characteristics and yield potential of varieties presently grown in Indiana can be determined by consulting Purdue Station Bulletin "Performance of Public and Private Small Grains in Indiana - 2000", web access: <http://shawdow.agry.purdue.edu/agronomy/ext/smgrain/variety/sm~var.htm> or talk to your seed dealer.

Rootworm Beetles Late in the Season – (*John Obermeyer, Rich Edwards, and Larry Bledsoe*) –

- Movement of western corn rootworm beetles into soybean fields was later this year
- Rootworm beetles are still active and numerous in some fields
- Please inform us if combines in your area "kick-up" bunches of rootworm beetles during early harvesting activities
- Green plants, especially with pollen, may be attracting large numbers of beetles

Astute pest managers are still reporting some very large numbers of western corn rootworm beetles in various crop and non-crop situations. This may have to do with the late growing season, as the western corn rootworm beetle variant initiated its movement between corn and soybean about two weeks later this year. These reports of late-season activity are mainly coming from areas where large numbers of beetles were seen in corn during pollination.

The potential impact of beetle infestations in September and early October is not known. However, it is expected that while alive, beetles will continue to lay additional eggs. In years past, it has been noted by many producers in west central and northwestern Indiana



"FLY-FREE" DATES FOR SEEDING WHEAT

counties that beetles have been all over the combine while harvesting soybean fields. Why hoards of beetles would be in mature, weed-free soybean fields is a mystery, as there is no green plant material to feed on. Should you experience this phenomena in your area, we would appreciate you calling and providing the following: 1) positive rootworm beetle identification, 2) presence (species) or absence of weeds, 3) approximate distance from corn, and 4) intensity of beetles (number covering a square foot area on a combine). Please call 765-494-4563. If you get voicemail, please leave the requested information, as well as your name, business, location, and phone number.

In areas where large numbers of western corn rootworm beetles are still active, the potential for larval damage in next year's corn exists. Crop, or non-crop areas, where green plants (e.g., forages, weeds, vegetables, etc.) are present and where corn will be planted in 2003, should be monitored now for rootworm beetles.

Western Corn Rootworm Feeding On Weed Pollen

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Black Light Trap Catch Report
(Ron Blackwell)

County/Cooperator	8/27/02 - 9/3/02							9/4/02 - 9/9/02						
	VC	BCW	ECB	SWCB	CEW	FAW	AW	VC	BCW	ECB	SWCB	CEW	FAW	AW
Clinton/Blackwell	0	10	128	0	50	4	8	0	4	28	0	26	9	7
Dubois/SIPAC	1	25	156	9	165	21	17	5	55	50	9	333	10	129
Jennings/SEPAC	0	10	70	0	59	8	9	0	4	59	0	104	19	17
Knox/SWPAC	0	2	186	6	4	0	3	2	5	44	3	6	0	6
LaPorte/Pinney Ag Center	0	0	88	0	47	3	2	0	2	103	0	58	1	4
Lawrence/Feldun Ag Center	0	70	39	0	64	8	131	2	17	22	0	24	18	59
Randolph/Davis Ag Center	0	1	71	0	4	3	3	0	0	143	0	13	3	10
Whitley/NEPAC	0	17	129	0	58	5	32	0	2	213	0	13	15	19

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

Plant Diseases

Soybean Sudden Death Syndrome – (*Gregory Shaner*) -

• Sometimes, never is better than late

Over the past couple of weeks, more and more soybean fields in Indiana have shown symptoms of sudden death syndrome (SDS). Affected areas may be extensive in a field, or confined to a few patches. The disease is most likely to show up earlier and be more severe in compacted areas. With the planting problems this spring, compaction is a greater problem than normal, and this has probably contributed to the widespread outbreak of SDS. Often the areas of SDS run parallel to the edge of a field and in about 30 ft. These are likely areas that are compacted because of extra traffic in the field.

The late appearance of symptoms would not normally be cause for concern about yield and quality of the crop, but because of the later than normal development of soybeans this year, there may be significant yield damage in affected areas of a field. Plants affected after pods are well developed may produce small seed.

I have not been able to conduct a survey of sudden death syndrome throughout the state, but it appears that the disease is more severe in northern and central Indiana, in areas that received heavy rains sometime during early grain filling.

Growers should make note of which fields show SDS and map the locations of affected areas. This can be useful information for future planting decisions in those fields. Where SDS is a problem, growers should avoid early planting of soybeans and use a variety with some resistance to the disease. It's also a good idea to make note of varieties that show severe symptoms of SDS, even if this is only in a few isolated patches in a field. Susceptible varieties should be avoided when planting a field that has any history of the disease.

It is more difficult to identify resistant varieties. If one field, planted with a particular variety, has SDS, but a nearby field, planted with another variety, has little or no SDS, one cannot necessarily conclude that the second variety is resistant. Planting date and field history have a strong influence on disease severity.

The best way to determine if a variety has resistance is to test it in replicated yield trials in several locations and years under severe and uniform SDS pressure. Scott Abney, with the USDA-ARS at Purdue, has been conducting such tests for several years and has identified several varieties that have a useful degree of resistance.

More information about sudden death syndrome of soybean can be found at <http://www.btny.purdue.edu/Extension/Pathology/CropDiseases/SoybeanSoybean.html#suddendeathsyndrome> or in Purdue extension publication BP-58 *Sudden Death Syndrome in Soybeans*.

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Preharvest Assessment of Indiana Corn Crop – (*Charles Woloshuk*) -

• There is concern about ear rot and mycotoxins

There is great concern about this year's corn crop. We have experienced delayed planting and endured many days with temperatures above 90 degrees and rainfall below normal. I am starting to hear reports of aflatoxin contamination occurring in some areas of Illinois. So what is the situation in Indiana?

Every year I assess the corn crop in two ways, road trips and a statewide survey. Looking at the corn near West Lafayette, I have found no need for concern about mycotoxins. Last week, I made road trips to as far south as Posey County and to as far east as Adams County. On my trip south, I stopped at a number of fields between Terre Haute and just south of Sullivan. I found no more than normal amounts, which is very little, of ear/kernel rots that are frequently associated with mycotoxins. In the area around Vincennes, I found fields with severe drought stress that had ears infected with the aflatoxin-producing fungus, *Aspergillus flavus*. The affected corn crop appeared scorched and the ears were only about 3 inches long. Finding Aspergillus ear rot in this area is no surprise, because the sandy soils increase the potential for drought stress, one factor making the plants more susceptible to the disease. In fields starting north of Princeton, going east of Princeton, south to Poseyville and to just north of Mt. Vernon, I was not able to find any evidence of *Aspergillus flavus* infections or evidence of higher than normal ear/kernel rot.

A second road trip began in Carroll County north of Delphi, passing to the south of Logansport and Peru, north of Marion, across northern Blackford County, up into Bluffton in Wells County, and then back to West Lafayette along Highway 26 from Portland. The corn was still green along this route and much farther from maturity than that in southern Indiana. We did not detect much ear/kernel rot. Many fields in Wells, Adams, and Jay Counties had extremely stunted plants. To my surprise, we could not find any evidence of *Aspergillus flavus*.

My current assessment of the Indiana corn crop is that yields will be down because of small ears and poor pollination, but I do not anticipate widespread ear rot and mycotoxin problems. I would advise grain producers and scouts to survey their fields for ear rots, especially those fields planted in light to sandy soils. If the weather continues to be dry, the corn will mature and dry down, halting any increase in ear rot damage. However, if the weather turns to a period of extensive rain, we could see an increase in ear rots and possibly mycotoxin contamination. My advice would be to harvest the corn crop as soon as possible and dry it to safe moisture for storage. Over the next month, we will be conducting our annual survey in collaboration with Indiana Agricultural Statistics. The data from this survey should tell us more about the ear rot and mycotoxin situation in Indiana.

Agronomy Tips

Risk of Fall Frost Injury to Immature Corn Grain - (Bob Nielsen) -

- The bad new is that, as of 15 September, late-planted corn younger than the early dent stage of kernel development will NOT likely mature safely prior to a killing fall frost
- The good news is that the overwhelming majority of Indiana's corn acres will be beyond that stage of development by that date, partially due to the continued warmer than normal weather to date

The shorter growing season that results from delayed corn planting often triggers concern among farmers and the grain markets that some late-planted corn may not safely mature prior to the occurrence of a killing fall frost. This concern is increasingly legitimate for corn planted later and later into June, especially in northern and eastern Indiana. As a reminder, approximately 75 percent of Indiana's 2002 corn crop was planted prior to June, another 17 percent between June 2 and June 9, and another 6 percent between June 9 and June 16 (Indiana Ag. Statistics Service, 2002). The majority of the later planted corn resides in southern Indiana, but pockets of late planted corn also exist in the eastern side of the state.

The point at which corn grain is "safe from frost" is defined as physiological maturity and is correlated with the appearance of the thin, black layer of dead tissue at the tips of the kernels. Grain moisture at physiological maturity ranges from 25 to 40 percent moisture content, but typically is near 30 percent. Additional field drydown is usually required before the grain can be harvested without damaging the kernels.

A killing frost prior to normal black layer formation will cause the premature development of the kernel black layer, resulting in incomplete grain fill and lightweight, chaffy grain. Grain moisture content will be greater than 35 %, requiring substantial field drydown before harvest.

Yield loss due to fall frost damage depends on the severity and extent of the plant damage (Carter & Hesterman, 1990). Yield losses from total plant death prior to kernel black layer are estimated to be 55, 41, and 12 % for soft dough, full dent, and half-milk line stages of development, respectively. Yield losses from death of leaves only (not stalk) prior to kernel black layer are estimated to be 35, 27, and 6 % for soft dough, full dent, and half-milk line stages of development, respectively. Yield losses are less when only leaves are killed because the surviving stalk can remobilize carbohydrates from the stalk tissue to the developing ear for some time after the damage occurs.

As of 8 September, only 20 percent of Indiana's corn was mature and "safe from frost", another 44 percent was at the dent stage of kernel development, while approximately 30 percent was at the dough stage (Indiana Ag. Statistics Service, 2002). Only about six percent of the state's crop had not yet reached the dough stage as of 8 September. These values describe crop development that is about one week behind the 5-year average, not bad considering that planting progress in late May was nearly three weeks behind the 5-year average!

Assessing the vulnerability of late planted corn to fall frosts hinges on whether immature grain will reach physiological maturity before a damaging frost. Many agronomists define a "killing fall frost" in terms of air temperature at 28 degrees F (-2 degrees C) or less that causes complete death of whole plants. Frost damage that occurs at slightly warmer temperatures will injure leaves, but will not necessarily kill the whole plant.

The timing of the occurrence of physiological maturity in corn can be estimated on the basis of kernel developmental stage at a point in time, the expected heat units or growing degree days (GDDs) necessary to advance the grain to physiological maturity from that point in time, and the expected availability of GDDs remaining from that point in time until the date of a killing frost. Research conducted by Peter Thomison (Ohio State Univ.) and myself demonstrated that late-planted corn matures in fewer GDDs than early-planted corn. Much of the reduction in season-long GDDs occurs during the grain filling period.

Based on our delayed planting/GDD research, average dates of fall frosts, and "normal" (historical) GDD

accumulation values for regions of Indiana, the following "guestimates" can be made about kernel stages of development as of 15 September that should safely mature prior to a killing fall frost.

Kernel Development Stages (as of 15 September) for Late May Plantings That Should Safely Mature Prior to Killing Fall Frosts

- Northern third of Indiana: Fully dented with visible kernel milk line
- Westcentral Indiana: Majority of kernels dented
- Central Indiana: Majority to fully dented
- Eastcentral Indiana: Fully dented with visible kernel milk line
- Southwest Indiana: Few to about half of kernels dented
- Southcentral and southeast Indiana: Half to majority dented

Kernel Development Stages (as of 15 September) for Early June Plantings That Should Safely Mature Prior to Killing Fall Frosts

- Northern third of Indiana: Majority to fully dented
- Westcentral Indiana: Few to about half of kernels dented
- Central Indiana: Few to about half of kernels dented
- Eastcentral Indiana: Majority to fully dented
- Southwest Indiana: Late dough to early dent
- Southcentral and southeast Indiana: Few to about half of kernels dented

The bad new is that by 15 September, late-planted corn younger than the early dent stage of kernel development will NOT likely mature safely prior to a killing fall frost. The good news is that the overwhelming majority of Indiana's corn acres will be beyond that stage of development by that date, partially due to the continued warmer than normal weather to date.

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

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Minimizing Harvest Losses in Drought Damaged Corn Fields – (*Peter Thomison, Ohio State Univ.*) -

This year's widespread drought has resulted in smaller than normal ears, and much greater percentage of "nubbin" ears in many fields. In addition, plants are shorter than normal with reduced ear heights. As a result of these conditions, some combine and harvesting adjustments may be necessary. The following are management suggestions from ag engineers and equipment specialists on harvesting drought damaged crops.

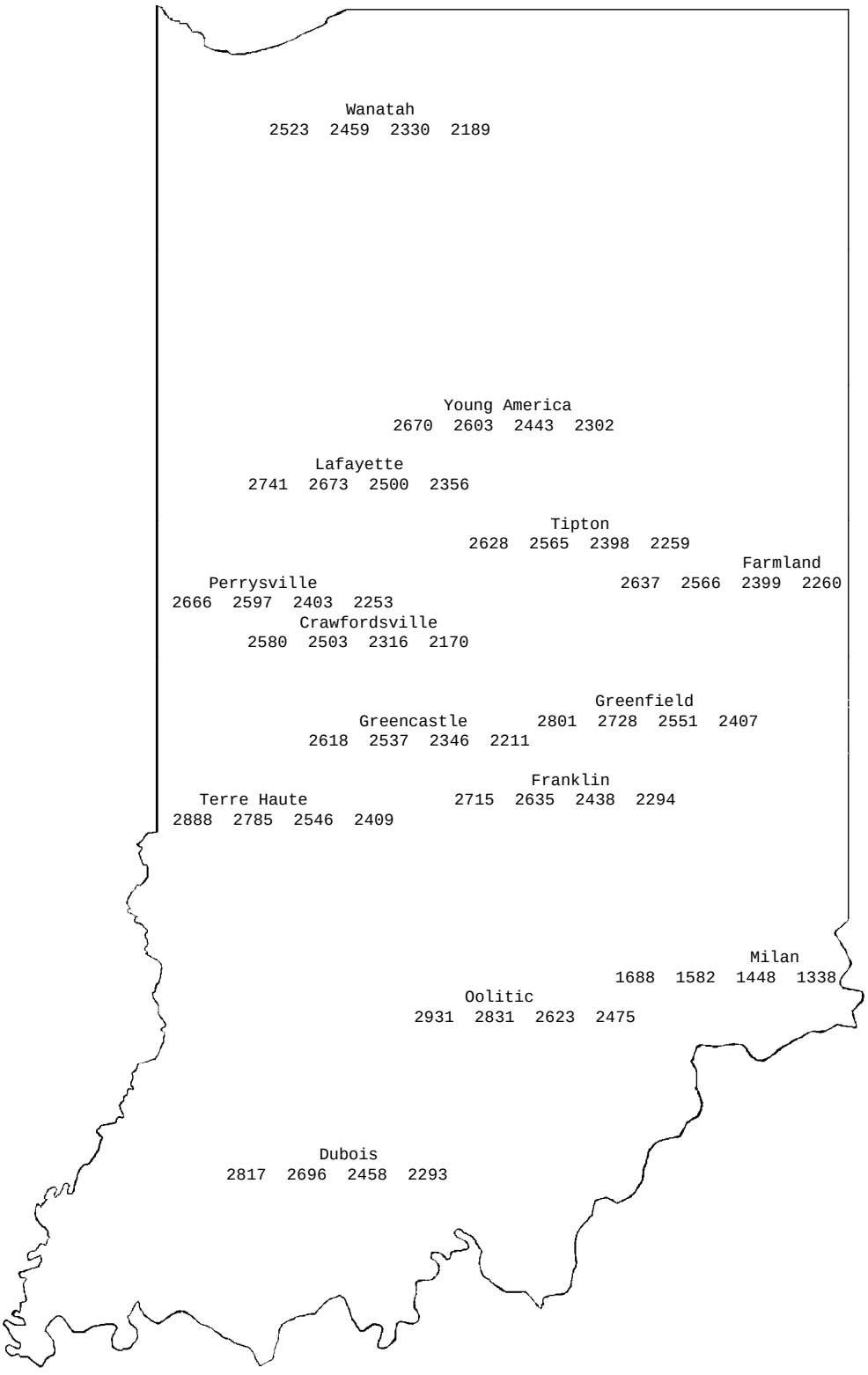
1. Review the operator's manual for suggestions on harvesting a "light crop".
2. With short or lodged corn, run the gathering snouts and chains low. Watch for stones, and be sure stone protective devises are working.
3. Drive carefully and at normal speeds to avoid excessive harvest loss and machine damage from stones.
4. For small ears, set stalk rolls and snapping plates closer than normal to snap off a higher percentage of ears. Do not attempt to snap off barren cobs.
5. If clean shelling is a problem, increase cylinder speed slightly, and if necessary, decrease concave clearance. With a rotary machine, check rotary concave clearance. Avoid excessive damage to kernels from good ears.
6. If cleaning losses are high, open the chaffer and chaffer extension slightly.
7. Initially decrease the amount of air from the cleaning fan. If cleaning becomes a problem, increase the fan blast, and close the lower sieve slightly.
8. Be alert to changes in weather and crop conditions, and make adjustments as necessary.

Weather Update

MAP KEY
Location
GDD(2) GDD(10) GDD(43) GDD (75)

Temperature Accumulations from Jan. 1 to Sept. 11, 2002

GDD(2) = Growing Degree Days from April 21 (2% of Indiana's corn planted), for corn growth and development
GDD(10) = Growing Degree Days from May 5 (10% of Indiana's corn planted), for corn growth and development
GDD(43) = Growing Degree Days from May 26 (43% of Indiana's corn planted), for corn growth and development
GDD(75) = Growing Degree Days from June 2 (75% of Indiana's corn planted), for corn growth and development



4" Bare Soil Temperatures 9/11/02

Location	Max.	Min.
Wanatah	92	70
Winamac	90	70
W Laf Agro	88	72
Tipton	84	75
Farmland	83	68
Crawfordsville	86	75
Terre Haute	92	75
Vincennes	85	76
Oolitic	86	76
Dubois	97	71

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http://www.entm.purdue.edu/Entomology/ext/targets/newslett.htm

Bug Scout

Ron Blackwell's soybean sweeps for western corn rootworm beetles is completed...now he's counting!

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