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## Insects, Mites, And Nematodes

Black Light Trap Catch Report - (John Obermeyer)

County/Cooperator	9/7/10 - 9/13/10							9/14/10 - 9/20/10						
	VC	BCW	ECB	WBC	CEW	FAW	AW	VC	BCW	ECB	WBC	CEW	FAW	AW
Dubois/SIPAC Ag Center	0	3	0	0	6	0	0							
Jennings/SEPAC Ag Center	0	0	0	0	1	0	0	0	0	0	0	13	1	4
Knox/SWPAC Ag Center	0	4	0	0	0	0	16							
LaPorte/Pinney Ag Center	0	1	0	0	0	0	0	0	1	0	0	5	0	0
Lawrence/Feldun Ag Center	0	0	0	0	11	0	3							
Randolph/Davis Ag Center	0	2	0	0	5	0	0	0	1	0	0	0	0	1
Tippecanoe/TPAC Ag Center	0	1	0	0	22	0	0	0	2	0	0	32	0	0
Whitley/NEPAC Ag Center	0	0	0	0	15	0	2	0	1	0	0	16	0	0

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

## Agronomy Tips

### Early Corn and Soybean Harvest: Should Wheat Be Planted Early? – (Shaun Casteel, Jim Camberato, and Kirsten Wise)

Corn and soybean harvest of 2010 has been the polar opposite of last year, which was one of the latest on record in Indiana. This year, as of September 19<sup>th</sup>, 27% of the corn and 20% of the soybeans have been harvested (USDA-NASS, 2010). This is about 3 and 2 weeks ahead of the five-year average for corn and soybean, respectively. Due to the early harvest many are asking “**Should I plant my wheat early?**”

**No!** Early planting of wheat increases the probability of infestation by Hessian fly, which lay eggs that hatch and the larvae (maggots) feed on young wheat seedlings. The optimal planting date for wheat in Indiana is within 7 to 14 days **after** the average Hessian fly-free date (Figure 1), which ranges from September 22 in northern Indiana to October 9 in southern Indiana. Another reason not to plant wheat early is the risk for disease infection in the fall increases with early planting, especially for seedling blights in warm soils (> 60°F) and barley yellow dwarf virus that is transmitted by aphids. And if increased pest pressure is not enough reason to hold off on early planting, excessive fall growth resulting from early planting also increases the risk of winter injury, and advanced wheat development can increase the risk of spring freeze injury.

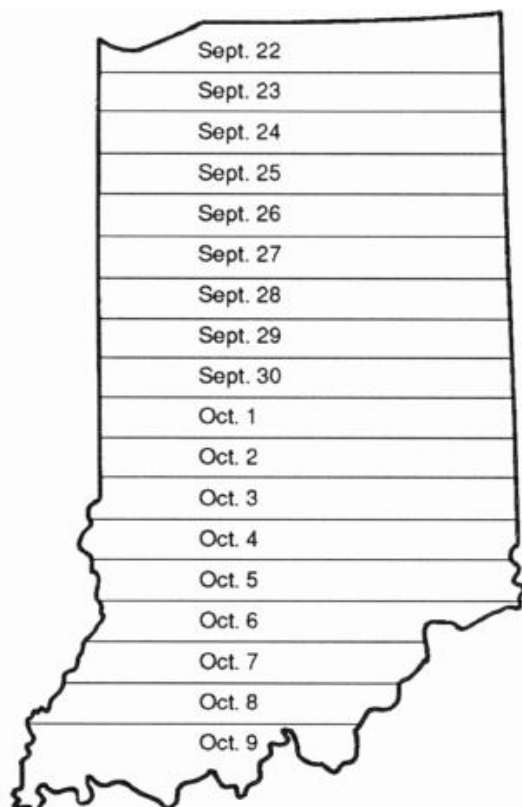


Figure 1. Average Hessian fly-free dates for Indiana.  
Illustration by C. Mansfield and S. Hawkins, Purdue University.

If corn and soybean fields have been harvested and the Hessian fly-free date has not occurred, this is a great time to take soil samples and apply lime or fertilizers to correct fertility issues. Remember the phosphorus soil test critical level for wheat is higher than for corn and soybeans and, so an application of phosphorus in the fall for wheat may be warranted even if none was needed for corn or soybean. Planting equipment should also be calibrated to ensure proper seed depths and seeding rates. Seeding depths around 1 inch are ideal, and an acceptable range is 0.75 to 1.25 inches. It is critical to calibrate planting equipment (e.g., replace worn seed openers, calibrate depth control, adjust coulters to cut through crop residue) to maintain seed placement and increase emergence potential. Optimum yields are normally obtained at plant populations of 1.3 to 1.5 million plants per acre (30 to 35 plants per ft<sup>2</sup>). The amount of seed needed to obtain this stand varies depending on the seed size, germination test, and emergence potential (factors include planting date, planting equipment, and seed bed conditions). Plant stands are estimated based on germination values and anticipated stand establishment at four seeding rates in Table 1. Seed weights are estimated in Table 2.

In short the answer is, “**No, wheat should not be planted early (i.e., prior to the Hessian fly-free date).**” Planting wheat early is risky business due to the potential damages from Hessian fly, fall diseases, winter injury, and spring freeze. Wheat should be planted after the Hessian fly-free dates to minimize stresses and maximize yield potential. For example, Hessian fly-free dates are around September 24 in Whitley County (northeastern Indiana) and around October 7 in Knox County (southwestern Indiana). Wheat should be planted by October 7 in Whitley and October 21 in Knox. Instead of planting wheat early use the extra time to soil sample and apply lime, phosphorus, and potassium where needed.

### References:

USDA-NASS, 2010. Indiana crop & weather report as of September 19. Vol 60:WC092010.

**Table 1. Examples of Wheat Seeding and Establishment Rates**

Seeding Rate	Germination	Live Seeding Rate	Percent Stand Establishment					
			100	95	90	85	80	75
			Estimated Plant Stand					
Seeds/ac	%	Seeds/ft <sup>2</sup>	Plants/ft <sup>2</sup>					
1,400,000	100	32	32	30	29	27	26	24
	95	31	31	29	28	26	25	23
	90	29	29	28	26	25	23	22
	85	27	27	26	24	23	22	20
	80	26	26	25	23	22	21	20
1,700,000	100	39	39	37	35	33	31	29
	95	37	37	35	33	31	30	28
	90	35	35	33	32	30	28	26
	85	33	33	31	30	28	26	25
	80	31	31	29	28	26	25	23
2,000,000	100	46	46	44	41	39	37	35
	95	44	44	42	40	37	35	33
	90	41	41	39	37	35	33	31
	85	39	39	37	35	33	31	29
	80	37	37	35	33	31	30	28
2,300,000	100	53	53	50	48	45	42	40
	95	50	50	48	45	43	40	38
	90	48	48	46	43	41	38	36
	85	45	45	43	41	38	36	34
	80	42	42	40	38	36	34	32

**Table 2. Wheat Seeding Rate and Seed Size**

Seeding Rate	Seed Size		
	Small 16,000 Seeds/lb	Medium 14,000 Seeds/lb	Large 12,000 Seeds/lb
Seeds/ac	Pounds of Seed Needed for Desired Seeding Rate		
1,400,000	88	100	117
1,700,000	106	121	142
2,000,000	125	143	167
2,300,000	144	164	192



## Fall Tillage Decisions in 2010 – (Tony J. Vyn)

In sharp contrast to last year's delayed crop maturity, late harvest and excessive rain, the 2010 corn and soybean harvest (thus far at least) has been extremely early and with mostly dry soil conditions. Those ideal conditions for harvest, and perhaps lingering frustrations over the inability to complete the intended fall tillage in 2009, have prompted many Indiana farmers to begin fall tillage within days of completing harvest on their individual fields.

Chisel plows, disks, disk-rippers, strip-till tools, moldboard plows and assorted vertical tillage equipment have seen lots of action already on many farms this September. The prevailing dry soil conditions have increased the draft (horsepower) requirements for operating at the intended depths, but there has been no shortage of traction. Generally higher crop prices this fall have made fuel costs for tillage seem less of a financial burden.

However, the main question is whether all that fall tillage should be done at all. Are this fall's tillage-conducive conditions (early harvest, dry soils, labor availability, etc.) reason enough for doing more intensive tillage than normal? Related questions involve considerations of what tool and how deep for specific soil type, field slope, and crop residue situations. I can't address all these and other relevant questions in this short article, but certain research experiences may be relevant to the tillage decisions still to be made in 2010.

### Crop Rotation:

Historically, the majority of fall tillage occurs before corn in Indiana. Zero tillage is much more common for soybean (60-70% of the acreage) than it has been for corn (20-29%) over the last decade. Research results from our long-term (1975-2010) crop rotation and tillage experiment on a dark prairie soil (silty clay loam with an average of 4% organic matter) near West Lafayette over the 10-year period from 2000 to 2009 indicate that there is no yield advantage for chisel or moldboard plowing, relative to no-till, when corn follows soybean (Table 1). Fall tillage was only beneficial to corn yield when corn followed corn.

Corn yield results in 2010 confirm the fact that crop rotation had a much bigger impact than tillage systems (Table 1). Growing corn after corn can sometimes have a huge yield penalty associated with it; the cool and excessively wet conditions in May and June appeared to be detrimental to continuous corn yields in 2010 even though we applied 200 pounds per acre of N fertilizer to these plots. In fields with timely corn planting (April) and little flooding damage during June, corn yields in 2010 were much less likely to be affected by tillage (witness the small 3-6 bushel spread among tillage systems in Table 1) than by rotation (note the 35 bushel yield gain for corn after soybean versus corn). So although the use of more stress tolerant corn hybrids, better seed treatments, and superior equipment and fertility management has helped to diminish the rotation advantage for corn compared to that in earlier decades, there still is additional yield risk in planting corn after corn regardless of the tillage system that is selected.

### Field Leveling:

In some cases, fields are still rough from the ruts created during the wet harvest conditions of 2009. In those field and field-area specific situations, fall tillage operations may have additional justification. But recognize that tillage is always only a partial solution on compaction-damaged soils. Weather conditions (freeze-thaw and wetting and drying cycles) as well as crop root development (field crops and cover crops) have a lot of impact on soil structure development over time. The loosening forces of tillage tools result in short-lived changes in soil structure, and soil reconsolidation is likely due to natural (weather related) and management (e.g., wheel traffic) events.

The unusually dry soil conditions thus far this fall have actually created ideal situations for the breaking up of compacted layers and the smoothing over of previously rutted fields. But even then, care should be taken to going no deeper than necessary and to leave as much protective surface residue as possible. The wide range of soil wetting and drying cycles experienced this year have already restored some soil structure (and particularly for fields with swelling

Table 1. Corn yield response to rotation and tillage systems in an experiment initiated in 1975 on a dark prairie soil near West Lafayette, Indiana (*Data courtesy of T. West, G. Steinhardt, and T. Vyn of the Agronomy Department*)

Crop Rotation	Tillage System	Corn Yields 2000-2009 (Bushels/Acre)	Corn Yields in 2010 (Bushels/Acre)
Continuous Corn	Moldboard Plow	200	184
	Chisel Plow	195	187
	No-till	178	186
Soybean - Corn	Moldboard Plow	202	216
	Chisel Plow	204	222
	No-till	201	220

and shrinking clay soils). Taking a shovel to suspected compaction areas and probing down to 15 or 20 inches prior to tillage might give farmers a better idea of whether deep loosening is needed, and to what depth.

### **Planting Date Flexibility:**

One of the key reasons many farmers prefer to do some tillage in the fall is to ensure that corn planting is not delayed in the spring. Achieving early planting goals is certainly possible in no-till systems, but good soil drainage, uniform residue distribution, and well adjusted no-till planters with sufficient banded N fertilizer are essential to achieve optimum results for a specific soil texture.

Our research experiences over the last 20 years have indicated that fall strip-tillage systems are ideal to give corn farmers additional planting flexibility than an undisturbed no-till situation, especially for situations when corn follows corn or winter wheat. Strip-till does not result in higher yields than no-till when corn follows soybean and all tillage systems are planted on the same date with good management. However, strip-till corn yields have exceeded no-till yields (even after soybean) when the earlier soil drying of properly formed strip-till berms enabled earlier planting than was possible with no-till. Corn yields when fall strip-tilled corn follows corn have consistently been higher than those possible with no-till corn on corn, and equal to those with chisel plowed corn on corn.

I can understand the frustrations and challenges of trying to complete strip tillage following harvest in a fall like 2009. But this year, we appear to have a much wider “win-

dow” to successfully create loosened soil strips that will facilitate stale-seedbed planting next spring. However, given the fact that so much crop has been harvested so early, farmers need to be aware that very early fall strip tillage also means more opportunity for berm consolidation re-occurring prior to soil freezing. Achieving good soil conditions in the strips next spring begins with achieving high enough berms this fall that later rain events this fall won't collapse the berms.

### **Final Comments:**

Good weather conditions and an early harvest are, by themselves, insufficient justification for intensive fall tillage in 2010. Farmers are encouraged to think carefully through their reasons for doing a particular tillage operation on each field, and recognize that other management factors like crop rotation, hybrid selection and nutrient management will likely have much more impact on the final corn yield in 2011 than the tillage system itself. “Recreational tillage” is still “expensive entertainment.”

As always, concern for soil conservation should be paramount. There is still a long time to go between late September of 2010 and April of 2011. Soil that is less subject to wind and water erosion events during that long exposure period will be more likely to be kept in place for near-term and long-term yield benefits.