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Thank you and have a happy holiday season!

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## Insects, Mites, And Nematodes

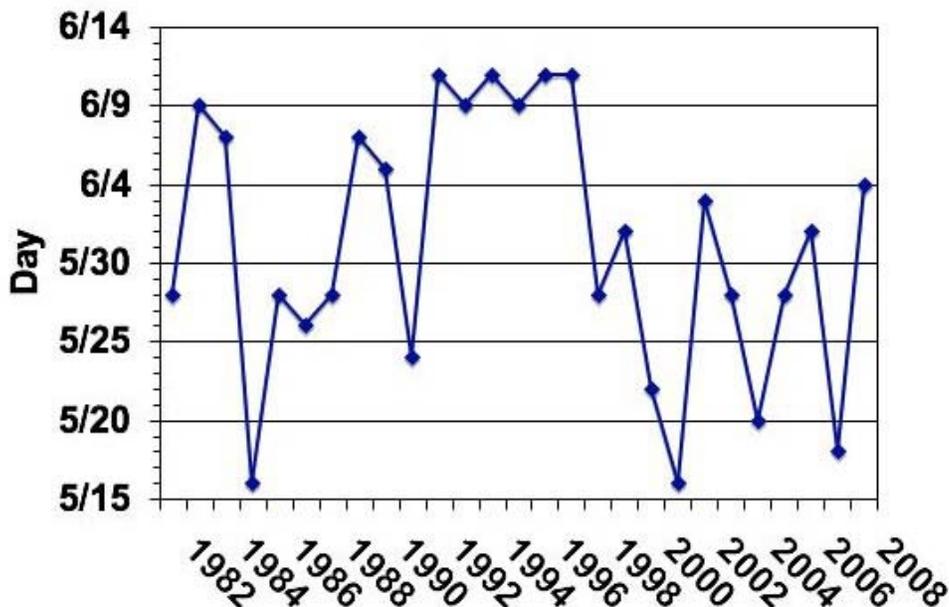
### Field Crop Insects: Review of the Season – (John Obermeyer)

2008 was the perfect example of how environmental extremes can have detrimental effects on insects. Simply stated...insects do drown! Overall, this past season was a bust for many field crop insects, especially those utilizing the soil for a portion of their biology, e.g., western corn rootworm. Certainly this year's wild swings in moisture and temperature wasn't unique to Indiana alone, but most Midwestern states saw dramatically lower insect pressure.

How is western corn rootworm (WCR) larval survival impacted by saturated soils? WCR adults have a tendency to lay eggs during late summer where soil is a little more moist and cooler than surrounding soil. These areas are typically found in soil types and field depressions that tend to collect and hold moisture in late summer. This is why the distribution of WCR injury in the following year tends to be clumped.

These same areas that are attractive to WCR adults for egg laying are where soils tend to become saturated first and remain wet longest when rain is extensive. Therefore, the impact of drenching rains on rootworm can be significant if the timing is correct. Over-wintering rootworm eggs are very resistant to flooding and fields would have to be submerged many days before adverse impact would occur. Newly hatch larvae, are particularly susceptible to saturated soil and will die after being denied air for a less than a day. As seen in the following graph, larvae throughout most of the state were hatching in late May to early June, just as rains were saturating much of the state's soil. Second instars that are still embedded in roots will generally not survive in submersed or heavily saturated soil after a day or two. The warmer the soil, the more rapidly stressed larvae die. Reported root larval damage and silk-feeding beetles were very low this past season, suggesting that rootworm pressure will be lower for 2009.

## First Observation of Rootworm Larvae in Corn Roots, Tippecanoe County, Indiana, 1982-2008



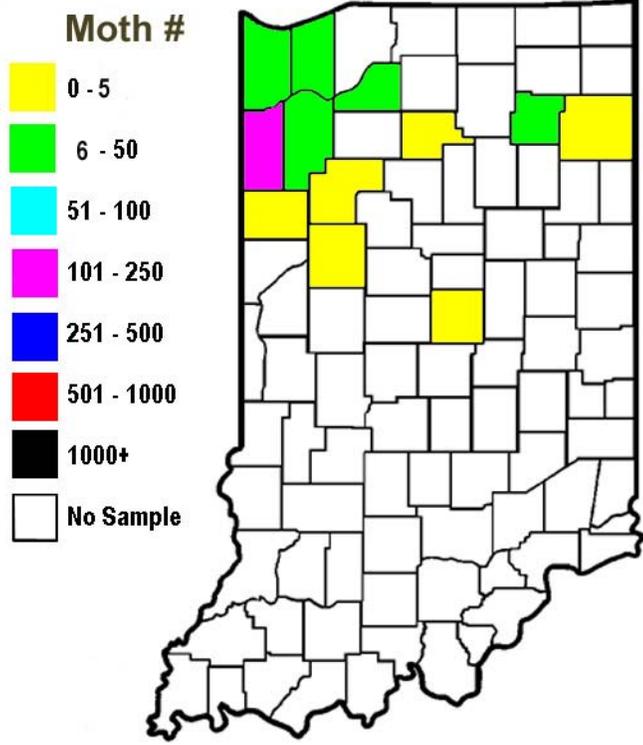
Interestingly, the soybean aphid bucked the trend of the “odd-year” phenomena. Since year 2000, soybean aphid has been a threat in only uneven years. Up through the first-week of August, it looked as though they would cooperate and be a LOW-show in Indiana soybean fields. By the third-week in August, pest managers were reporting a sudden surge of aphid numbers in northern Indiana fields. To complicate issues, spider mites too were flourishing where dry conditions persisted throughout the later portion of the summer. Scouting paid dividends, because of the tremendous variability in aphid and mite numbers from field to field. Though it is unknown how extensive the aphid/mite infestations were, certainly higher commodity prices made treatment decisions easier even though soybean were mostly in the R5/R6 (full seed) growth stages, on the late side of an economic return. Too, I am hinting at the possibility of fields being treated with insecticides far below threshold levels.

managers to inspect corn ears while visiting fields later in the season. This is especially true because Herculex (HX1 and XTRA) is more efficacious against western bean cutworm than YieldGard, thus a marketing advantage. The reality is that statewide, corn earworm has, and still is, the greater threat to cause ear damage (which by the way, all above-ground Bt events are only marginal in earworm control). However, in northwestern counties, western bean cutworm has shown in a few fields how severe damage can be. Though there is much to be learned about this new species of cutworm in Indiana, there seems to be a higher correlation of damage to fields in continuous corn and lighter textured soils. Larvae, and their damage, have been found as far east as Marshall County, moth captures in northeastern Indiana and northwestern Ohio indicate that this damage will likely continue eastward. How far, and how fast, is anybody’s guess.

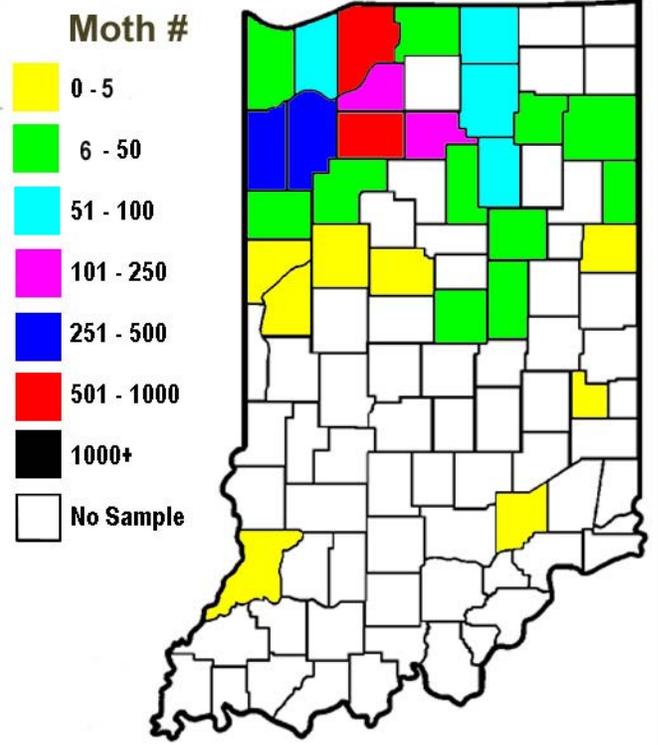
Worms feeding in corn ears were probably the most interesting story for the year, admittedly from my perspective. With many late-planted fields this year, later-developing corn was in abundance. This set the stage for ear-feeding insects, i.e., corn earworm, fall armyworm and western bean cutworm. The arrival of the western bean cutworm into the state, first moths captured in 2006, has encouraged pest

The following maps compare the last three years of western bean cutworm moth captures in pheromone traps throughout Indiana. Compilation of these maps would not have been possible without the help of many cooperators, thanks to their efforts in monitoring the traps and entering the data at <http://www.ent.iastate.edu/trap/westernbeancutworm/>.

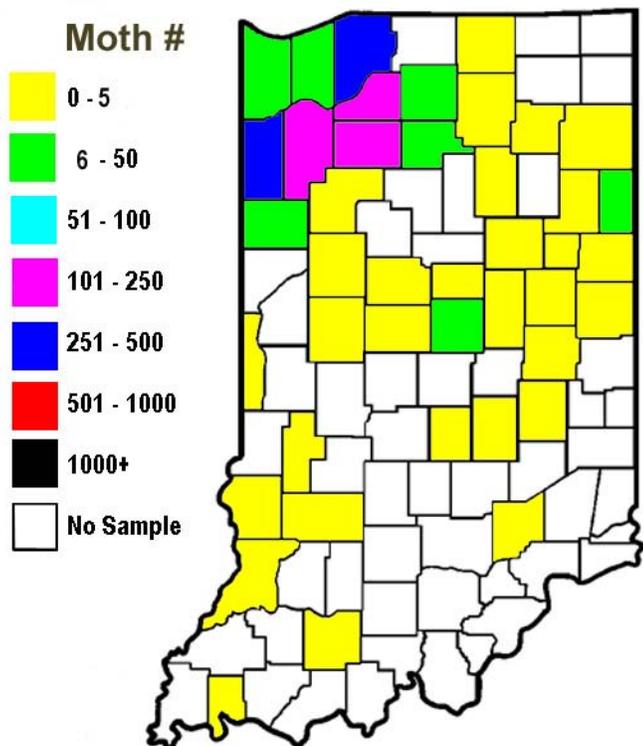
Indiana County Western Bean Cutworm Moth Captures in Pheromone Traps Throughout Indiana 2006



Indiana County Western Bean Cutworm Moth Captures in Pheromone Traps Throughout Indiana 2008



Indiana County Western Bean Cutworm Moth Captures in Pheromone Traps Throughout Indiana 2007



# Weeds

**Herbicide Update** – (Glenn Nice, Bill Johnson, Tom Bauman, and Tom Jordan)

**Kixor [saflufenacil or BAS800] – BASF:**

[Not labeled in Indiana] is a new herbicide from **BASF** that will be labeled for use in corn, soybean, small grains, and tree/nut/vine cropping systems. Saflufenacil is a PPO inhibitor, similar to flumioxazin [**Valor**] and sulfentrazone [**Authority**]. It has shown good foliar and residual activity on horseweed [marestail], giant and common ragweed, lambsquarter, velvetleaf, and pigweed/waterhemp species and thus would fit in both the no-till and conventional-till corn and soybean market. It is anticipated that **Kixor** and **Kixor** containing products will be labeled for use for the 2010 season. **BASF** has indicated that they will market saflufenacil alone [proposed trade is **Sharpen**] and as premixes with imazethapyr [**Pursuit**] [proposed trade name is **Optill**] and dimethenamid-P [**Outlook**] [proposed trade name is **Integrity**].

**Authority Assist [3.33 lb ai sulfentrazone + 0.67 lb ai imazethapyr / gal] – FMC:**

[Labeled in Indiana] Last year we mentioned **Authority Assist**, a premix of **Authority** and **Pursuit**, but at that time it was not labeled. **Authority Assist** is now labeled for preemergence use in soybean. It can be applied from 45 days before planting to 3 days after planting. To avoid the potential of seedling injury do not apply at cracking. Rates are from 6 to 12 fl oz/A depending on soil texture and percent organic matter [Table 1].

The sulfentrazone component has shown excellent preemergence control of pigweed, lambsquarter, morningglory and good control on annual smartweeds and black nightshade. The addition of imazethapyr will increase control on velvetleaf and foxtail.

**Balance FLEXX [isoxaflutole + safener], Corvus [isoxaflutole + thiencazabone + safener], and Capreno [tembotrione + thiencazabone + safener] – Bayer CropScience:**

[Not presently labeled in Indiana] **Balance FLEXX**, **Corvus** and **Capreno** will all include a new safener to reduce the potential of injury to corn. The new safener is reported by **Bayer CropScience** to increase corn metabolism of isoxaflutole<sup>1</sup>. Thiencazabone controls grass and broadleaf weeds and is an ALS inhibitor<sup>2</sup>. In trials in the Midwest, the addition of thiencazabone was reported to increase giant ragweed and morningglory control over **Balance Pro** alone. **Capreno** is a premix of **Laudis** [3.5 lb tembotrione] and thiencazabone.

**Callisto [4 lb ai mesotrione / gal] – Syngenta:**

[Labeled in Indiana] There have been some changes to the **Callisto** label this year. The first change has been to change the control of burcucumber from ‘partial control’ to ‘control’. The label recommendations are 3 fl oz/A to be tank mixed with 0.25 lb ai/A atrazine with COC and AMS. In a study done at Purdue University in North West Indiana, **Callisto** coupled with a preemergence of **Dual II Mangum** [7.64 lb s-metolachlor] or **Lumax** [2.68 lb s-metolachlor + 0.28 lb mesotrione + 1 lb atrazine] controlled burcucumber 91% or 96%, 29 days after treatment respectively<sup>3</sup>. Burcucumber is a vine that can germinate as late as August and still become a problem at harvest. **Callisto** and atrazine provide some residual control of burcucumber, but complete success at harvest may also depend on environmental conditions and soil type. Muck soils provide a challenge to all residual herbicides. Unfortunately this is the case with several residual products that have activity on burcucumber.

A “tank mix with glyphosate” section has been added to the label for Roundup Ready [RR] corn. This section allows the use of 3 fl oz/A of **Callisto** in a tank mix with glyphosate plus AMS at 8.5 to 17 lb/100 gals. This section warns not to add COC or UAN to the tank mix if the glyphosate product has a premixed adjuvant. If an adjuvant is required by the glyphosate product it is recommended to use 0.25% to 0.5% v/v NIS as the adjuvant. Failure to follow these recommendations may lead to crop injury.

**FlexStar [1.88 lb ai fomesafen / gal] – Syngenta:**

[Labeled in Indiana] Previous to recent supplemental labeling, **FlexStar** could be tank mixed at 6-12 fl oz/A with glyphosate. New supplemental labeling allows rates up to 24 fl oz/A in Southern Indiana [defined as being south of I-70]. In Northern Indiana, above I-70, a maximum rate of 20 fl oz/A can be tank mixed. This is due to potential carryover concerns with the **FlexStar** active ingredient into corn. **FlexStar** has a 10 month rotation restrictions to field corn and a 12 month rotation restriction for popcorn when

**Table 1. Authority Assist Rate Structure**

Soil Texture	Percent Organic Matter	
	1% to 2%	2% to 4%
-----fl oz/A-----		
Coarse <sup>1</sup>	6 to 8 (4) <sup>2</sup>	8 to 10 (4 to 5)
Medium	8 to 10 (4 to 5)	10 to 12 (5 to 6)
Fine	10 to 12 (5 to 6)	12 (6)

Use higher rates for soils with pH less than 7 and lower rates for pH greater than 7 within the rate structure.

<sup>1</sup>Do not use on sand with less than 1% organic matter.

<sup>2</sup>A reduced rate structure is provided to be used in the fall, preplant, and preemergence in a Roundup Ready soybean system.

1 pt/A or more is used. For individuals wishing to plant winter wheat in the fall, applications must occur at least 4 months before planting.

**FulTime [2.4 lb ai actochlor + 1.6 lb ai atrazine / gal] and TopNotch [3.2 lb ai acetochlor / gal] - Dow AgroSciences:**

[Labeled in Indiana] The **TopNotch** and **FulTime** labels have expanded on the rotation restrictions. The previous label specified the rotation restrictions with corn, sorghum, soybeans, tobacco, and wheat. Several crops and situations were not addressed in these rotation restriction sections, but the labels have been reworked to include several other crops. Corn can be planted anytime after an application of either **FulTime** or **TopNotch**, including replant situations. Since **TopNotch** does not have atrazine, several crops such as alfalfa, sorghum, soybean, sugar beets, tobacco, sorghum, etc. can be planted the following spring. Wheat has a 4 month restriction with **TopNotch**, which works with the fall seeding of wheat.

**FulTime** is a premix containing atrazine, which changes the rotation interval for several sensitive crops. Alfalfa, sugar beets, tobacco and others require 15 months between application and planting. This also pushes back wheat to 15 months.

**Ignite 280 SL [2.34 lb ai glufosinate / gal] – Bayer:**

[Labeled in Indiana] **Ignite 280 SL** is similar to **Liberty**; however, **Ignite 280 SL** contains a higher concentration of the active ingredient at 2.34 lb ai/gal. **Ignite 280 SL** is labeled for crops that are glufosinate tolerant, known as **Liberty Link** [LL]. At present, there are LL corn hybrids

available and in the future there will be LL soybean varieties [see weed science section below]. **Ignite 280 SL** can also be used before planting or prior to emergence in conventional soybean or corn. See Table 2 for a rate comparison between **Ignite 280 SL** and **Liberty**.

Glufosinate does not have any residual activity and will not control weeds not yet emerged. A second preemergence application or a postemergence applications may require tank mixing with a residual products for extended control in problematic fields. Sequential applications should be at least 10 to 14 days apart. Maximum amount that can be applied on LL corn and soybean, in sequential applications, is 44 fl oz/A/growing season. For more consistent lambsquarter and velvetleaf control apply between dawn and 2 hours before sunset. The use of soil residual herbicides before crop emergence can reduce the number of crop postemergence applications required or provide a larger window for later season control.

Ignite 280 SL fl oz/A	Glufosinate lb ai/A	Liberty fl oz/A
22	0.40	31
26	0.48	36
38	0.66	50

In LL corn, **Ignite 280 SL** can be applied over-the-top to corn up to and including V5 [five developed collar leaves] at a rate of 22 fl oz/A. To reduce possible leaf burn Ignite 280 SL must be applied with ammonium sulfate [AMS] at 3 lb/A or 1.5 lb/A if temperatures are expected to exceed 85°F.

**Table 3. Comparison of Glufosinate and Glyphosate on Six Troublesome Weeds. [Adapted from Beyers et.al. 2002. Weed Technology 16:267-273].**

Herbicide	Rate	Weeds					
		Foxtail <sup>1</sup>	Velvet <sup>2</sup>	Lambs <sup>3</sup>	G. Rag <sup>4</sup>	Cockle <sup>5</sup>	Morn <sup>6</sup>
	<b>lb ai*</b>						
Glufosinate	0.28	81	92	72	83	81	92
Glufosinate	0.36	88	91	74	90	97	93
Glufosinate fb glufosinate	0.28 fb* 0.28	96	95	90	99	96	96
	<b>lb ae*</b>						
Glyphosate	0.56	95	92	94	90	76	82
Glyphosate	0.75	96	93	94	95	87	90
Glyphosate fb glyphosate	0.56 fb* 0.56	97	97	98	97	98	95

\*lb ai = pounds active ingredient; lb ae = pounds acid equivalent; fb = followed by  
<sup>1</sup>Giant foxtail - averaged over DeKalb IL; Urbana IL 1997 and 1998; Columbia MO 1997-98.  
<sup>2</sup>Velvetleaf - averaged over DeKalb IL 1997-98; Urbana IL 1997.  
<sup>3</sup>Common lambsquarters - averaged over DeKalb IL 1997 and 1998; Urbana IL 1997 and 1998.  
<sup>4</sup>Giant ragweed - averaged over two years at one site, DeKalb IL, 1997 and 1998.  
<sup>5</sup>Common cocklebur - averaged over two years at one site, Columbia NO 1997 and 1998.  
<sup>6</sup>Ivyleaf morningglory - averaged over Urbana IL 1998; Columbia NO, 1997-98.

**Ignite 280 SL** can be applied postemergence at 22 fl oz/A in LL soybean from emergence up to but not including the bloom stage. Applications should be made 70 days before harvest of soybean. Do not graze or cut soybean for hay. Unlike corn, the soybean section of the **Ignite 280 SL** label did not have an AMS use requirement at the time of writing this article.

**Ignite 280 SL** and the LL system will be marketed as an alternative to a glyphosate tolerant system. It allows rotating herbicide modes of action to reduce the potential of developing glyphosate resistance biotypes of weeds. Glufosinate and glyphosate are both non-selective herbicides and slight differences exist in efficacy of some species [Table 3]<sup>5</sup>. Glufosinate can be slightly less effective on grasses such as yellow foxtail, johnsongrass, quackgrass, shattercane, and barnyardgrass, but is more effective on some of the broadleaf weeds such as annual morningglory, black nightshade, and smartweed. Timing is more crucial than with glyphosate<sup>6,7</sup>. However, weed size is still important with glyphosate; spray applications should be done when weeds are 4 to 6 inches tall.

**Lexar [1.74 lb ai s-metolachlor + 0.224 lb ai mesotrione + 1.74 atrazine / gal] – Syngenta:**

[Labeled in Indiana] New changes to the **Lexar** label touch on the incorporation method. A cautionary statement has been added that if rainfall does not occur within 7 days of application efficacy may be decreased. If irrigation is available, apply 0.5 to 1 inches of water to incorporate herbicide. If neither rainfall or irrigation occurs a shallow cultivation is recommended as soon as weed emerge. **Lexar** is not labeled for sweet corn or popcorn.

**NIC-IT [2 lb ai nicosulfuron / gal] – Cheminova:**

**NIC-IT** has the same active ingredient found in **Accent** [75% nicosulfuron]. It is labeled for field corn (seed or grain) popcorn, and sweet corn. **NIC-IT** can be applied at a rate of 2 to 4 fl oz/A up to V6 or 20 inch corn. However, the label recommends early post applications to corn less than 12 inches tall. This maintains applications on small weeds to reduce weed competition with corn. Nicosulfuron is excellent on several annual and perennial grasses such as foxtails, johnsongrass, quackgrass, and shattercane; good to excellent on barnyardgrass and fall panicum, but weak on crabgrass. Also has good activity on some broadleaf weeds such as annual morningglory, jimsonweed, pigweeds, and annual smartweeds. For season long control apply in a program that utilizes a residual herbicide. For best results, apply to 2 to 4 inch foxtail and fall panicum, 4 to 10 inch quackgrass, 4 to 12 inch shattercane, and 8 to 18 inch rhizome johnsongrass.

**Stout [67.5% nicosulfuron and 5% thifensulfuron / gal] – DuPont:**

[Labeled in Indiana] **Stout** is a premix of **Accent** and **Harmony** [75% thifensulfuron]. **Stout** can be applied at a rate of 0.5 to 0.75 oz/A to field corn with a relative maturity rating

of 77 days or more. **Stout** can be applied to corn that up to V5 or 16 inches tall. Apply with COC at 1% v/v, MSO at 0.5% v/v, or NIS at 0.25% v/v. The use of UAN at 2 qt/A or AMS at 2 qt/A is also required. If tank mixed with **Callisto** at a rate greater than 1.5 fl oz, the use of MSO is not recommended.

**Sequence [2.25 lb ae glyphosate + 3 lb ai s-metolachlor / gal] – Syngenta:**

[Labeled in Indiana] **Sequence** is a glyphosate and **Dual II Magnum** premix labeled for corn, soybean and sorghum. It can be applied as a fall, preemergence or postemergence broadcast application in glyphosate resistant hybrids and cultivars. The glyphosate component will not control weeds that have not emerged. The s-metolachlor component will not have activity on emerged weeds, but will provide some residual activity. Residual activity will be decreased if not activated by rainfall or irrigation within 7 days. The s-metolachlor component can provide good preemergence control of annual grasses yellow nutsedge, black nightshade and pigweeds.

**Valor SX [51% flumioxazin] – Valent:**

[Labeled in Indiana] A new supplemental label allows the use of **Valor** before field corn emergence in no-till or minimum tillage. Apply in the spring 14 to 30 days before planting at a rate of 2 oz/A. **Valor** will provide residual and some burndown activity, if used in a burndown treatment it is recommended to be applied with an appropriate burndown partner such as 2,4-D, Gramoxone Inteon, or a glyphosate product. Do not apply irrigation until field corn is at least at the 2-leaf stage. Do not incorporate crop residue. **Valor** has good to excellent preemergence activity of black nightshade, lambsquarter, pigweeds, horseweed/marestail, and waterhemp.

**References:**

1. Farm and Range Guide. New Weed Control Products for Corn. <[http://www.farmandranchguide.com/articles/2008/08/26/ag\\_news/agri-tech/tech10.txt](http://www.farmandranchguide.com/articles/2008/08/26/ag_news/agri-tech/tech10.txt)>
2. Philbook, B.D. and H. Santel. 2007. Thien carbazole-methyl: a new molecule for pre and postemergence weed control in corn. NCWSS PROC. 62:150. <<http://www.ncwss.org/proceed/2007/Abstracts/150.pdf>>
3. Johnson, B. 2005. Annual Research Report. Number 026. <<http://www.btny.purdue.edu/weedscience/resreport/BJ2005/04PC01.pdf>>
4. Wiesbrook, M.L., W.G. Johnson, S.E. Hart, P.R. Bradley, and L.M. Wax. 2001. Comparison of weed management systems in narrow-row, glyphosate-and glufosinate-resistant soybean (*Glycine max*). Weed Technology 15:122-128.
5. Beyers, J.R.T., R.J. Smeda, W.G. Johnson. 2002. Weed management programs in glufosinate-resistant soybean (*Glycine max*). Weed Technology 16:267-273.
6. Steckel, G.J., L.M. Wax, F.W. Simmons, and W.H. Phillips, II. 1997. Glufosinate efficacy on annual weeds is influenced by rate and growth stage. Weed Technology. 15:484-488.
7. Loux, M.M., A.F. Dobbels, J.M. Stachler, W.G. Johnson, G.R.W. Nice, and T.T. Bauman. 2008. Weed Control Guide. WS-16.

# Agronomy Tips

## Conventional Tillage Not Required, but Crop Rotation Still Beneficial, for High Corn Yields in 2008 - (Tony J. Vyn and Terry D. West)

### Introduction

Corn farmers in parts of Indiana (such as NC Indiana) that had little drought stress have been pleasantly surprised at their very high yields. Farmer reports of yields in the 220 to 260 bushel per acre range have been frequent for corn after soybean and even for fields where corn has followed corn. In many cases, 2008 corn yields on individual farms have broken previous yield records for those same fields. Many Indiana farmers experienced a year with low stress if they did not suffer from either too much rain in spring (which necessitated replanting on portions of numerous farms) or from too little rain in summer. Low corn plant stress in 2008 was primarily evident to our own frequent plot scouting this summer in the forms of low insect pressure, low incidence of silk clipping during pollination, low foliar disease pressure and, perhaps most importantly, moderate temperatures during pollination and much of the grain filling period. Low temperatures during the reproductive period contributed to delayed maturity and higher grain moisture contents than expected for a given hybrid maturity, but these were also beneficial to yield (as long as moisture wasn't limiting).

Our long-term tillage plots were no exception to the numerous on-farm trends for realizing exceptional yields; we also achieved record corn yields in multiple experimental locations in 2008. Was tillage beneficial in 2008? Our recent corn yield results can provide some perspectives on the latter question, and on the related question as to whether continuous corn yields could match those for corn after soybean in a high yield year.

### Corn Yield Results in 2008

Corn yields at our long-term tillage plots on the dark prairie soil near West Lafayette have never been so high in our 34 year history at that site. Nevertheless, even then, the 2008 results presented in Table 1 confirmed that it is entirely possible to get yields above 250 bushels per acre

in continuous no-till and that no-till corn yields after soybean were not significantly lower than those after conventional tillage (statistics not shown). Furthermore, it would have been challenging to economically justify either chisel or moldboard plowing following soybean for this location in 2008 (economics not shown). Tillage was only beneficial for continuous corn; in that case corn yields were from 12-20 bushels higher with these full-width primary tillage systems than after no-till.

Our short-term tillage experiment results provide further evidence of the small yield differences within a common planting date between no-till and either chisel or strip-till when corn follows soybean (Table 1). As in previous research, the sole yield benefit potentially associated with strip-till corn, compared to no-till corn following soybean, is if the strip-till provided an opportunity to gain yield because of enabling earlier planting.

At our northern Indiana location (Wanatah), corn yields in our 12-year tillage study were very similar in 2007 and 2008 so the results in Table 2 were averaged for those 2 years. Although no-till corn yields were slightly lower (11 bushels/acre) than those after chisel plowing in both continuous corn and corn-soybean systems, it is equally clear that strip-till corn yields were virtually identical to those after chisel plowing in both rotation scenarios. The latter is not new information; fall strip-till corn yields have equaled those after fall chisel plowing for the last 9 years at this site.

Furthermore, the crop rotation yield advantage associated with corn after soybean is still noticeable even when continuous corn yields are above 220 bushels per acre. The observed crop rotation advantages in 2008 were as low as 4% for the moldboard plow situation and as much as 10% for the continuous no-till system at West Lafayette (Table 1). Corn rotation yield advantages averaged about 7% at the Wanatah location (Table 2). We have observed that the rotation advantage is smaller with current hybrids and management than it was 20 or 30 years ago, and that the percent yield advantage for rotation corn is highly dependent on the tillage system chosen for the comparison.

**Table 1. Effects of tillage (and crop rotation) on 2008 corn yields in long-term (1975-2008) and short-term experiments. Chalmers silty clay loam soil, West Lafayette, IN.**

Tillage Treatment	Long-term (34 yr) Tillage Study at West Lafayette		Short-term Tillage Plots at West Lafayette	
	Corn After Soybean (bu/acre)	Continuous Corn (bu/acre)	Corn After Soybean Planted April 22 (bu/acre)	Corn After Soybean Planted May 27 (bu/acre)
Fall Moldboard	261	251	---	---
Fall Chisel	262	243	241	216
No-Till	256	231	235	209
Fall Strip-Till	---	---	241	218

**Table 2. Effects of tillage and crop rotation on mean corn yields for 2007 and 2008. Sebawa loam soil, Wanatah, IN.**

Tillage Treatment	Corn After Soybean (bu/acre)	Continuous Corn (bu/acre)
Fall Moldboard	239	225
Fall Chisel	238	221
No-Till	227	210
Fall Strip-Till	239	221

**Conclusions**

In summary, tillage system choice has less consequence for achieving high yields than other management factors. Hybrid selection and achieving optimum plant density and fertility levels are generally more important factors in the pursuit of high yield corn. Conventional tillage is not essential for achieving high corn yields. Even in situations (such as corn following corn) when no-till corn yields are somewhat lower, fall strip tillage is preferred over chisel plowing as the alternative to no-till because strip tillage usually yields equal to chisel while providing superior erosion protection. In addition, crop rotation still boosts corn yields and, if everything else (soil quality, drainage, management, etc.) is equal, yield-contest aspiring farmers should still avoid continuous corn.

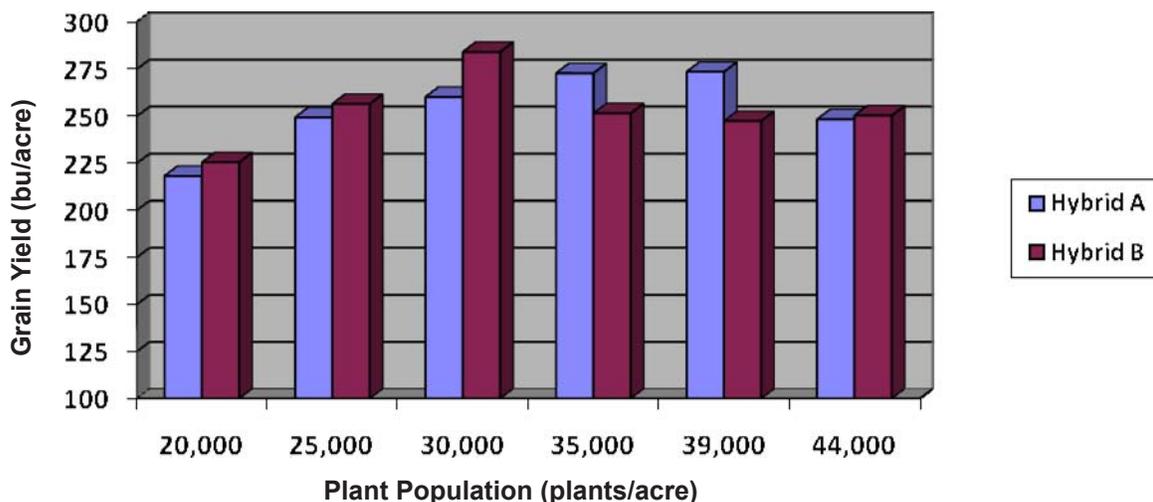
**Acknowledgments**

We thank Pioneer (Dupont), Remlinger Manufacturing, Case IH, and John Deere for their in-kind donations that have helped us continue these tillage experiments in recent years. Financial support for the various studies was provided by Purdue University College of Agriculture (Mission Oriented Grant) in 2007, USDA in 2003-2006, John Deere (strip tillage research at West Lafayette in 2006-2008), and Monsanto (plant density research in 2008). We also thank the farm superintendents of the Agronomy Center for Research and Education (J. Beaty) and the Pinney-Purdue Agricultural Center (J. Leuck). Unfortunately, the long-term tillage experiment at Wanatah will be discontinued, in part because of lack of research funding. The long-term tillage plots at West Lafayette face a similar funding challenge.

Our highest no-till corn yields this season (284 bushels/acre) were achieved in a 6-rep experiment investigating the interactions between hybrids and plant populations (Figure 1). In this experiment, no-till corn followed no-till soybean in 2007. These results illustrate the large effect of density on final yield in a year with ideal conditions for pollination (i.e. virtually no barren plants at any density). For hybrid A, maximum yields were obtained at 35,000 to 39,000 plants per acre. For hybrid B, maximum yields were achieved at a population of 30,000 plants per acre. Although the economically optimum density for this year and location/environment is dependent on seed costs as well as hybrid characteristics, it is interesting to observe how corn yields in 2008 increased by 30 bushels per acre, or in one case declined by 30 bushels, by a simple increase of 5,000 plants per acre in the final stand.

There is no reason to believe that optimum corn plant densities are any higher or lower in no-till than they are in tilled soils. In fact, final plant populations have been equal in no-till versus conventionally tilled plots for at least the past decade because of generally superior seed treatments and improved seed placement by modern planting equipment.

**Figure 1. No-till corn yield response to hybrid and plant population in 2008. Chalmers silty clay loam soil, West Lafayette, IN.**



## Bits & Pieces

**2008 Post Harvest Training and Recertification Workshop** – The 2008 Post Harvest Training and Recertification Workshop will be held on December 10, 2008 at the Beck Agricultural Center for Research and Education, 4540 U.S. 52 W., West Lafayette, IN. CCH's approved are: Category 7A – 5 CCH, Category 7D – 6 CCH, Category RT – 4 CCH. Session contents are:

- **Session 1:** Aflatoxin Prevention & Mycotoxin Management
- **Session 2:** Aeration and Quality Grain Management
- **Session 3:** Pest Sampling – How Do You Determine Fumigation Timing?
- **Session 4:** Individualizing the Fumigation Management Plan – Precision Fumigation of Grain and Structures
- **Session 5:** RUP Recordkeeping, Fumigant Storage, Management Practices
- **Session 6:** Fumigation Alternatives

For more information please go to <<http://extension.entm.purdue.edu/pdf/postharvest.pdf>> or call Sally Shewmaker, Agribusiness Council of Indiana, 317-684-5450, email: <[sshewmaker@inagribiz.org](mailto:sshewmaker@inagribiz.org)>.



**The 2008 CCA Conference** – The Indiana Crop Adviser Conference will be hosted at the Indianapolis Marriott East, go to <[www.indianapolismarriott.com](http://www.indianapolismarriott.com)> for directions. A block of rooms has been reserved at a rate of \$82.00 plus taxes / night single or double for December 16 and 17, 2008. Please let the hotel know you are with the Indiana Certified Crop Adviser Group. Reservations need to be made by November 21, 2008.

- Two-day format covered all four performance objectives for CCA, plus Professional Development.
- Maximum flexibility: participants can follow one track or choose multiple tracks; attend one day or two; most sessions offered twice.
- Nationally recognized speakers.
- All sessions in same area for easy rotation.
- CCAs can earn 16 CEUs at single event
- Conference Proceedings on CD
- Tue. Evening Reception
- Network with CCAs, farmers, researchers, consultants and industry folks
- Each session equals 1 CEU
- Get a “jump” on winter meetings and consulting with timely information and data.

To view information about the conference: <<http://www.indianacca.org/Conference/2008/>>. You can register at: <<http://www.indianacca.org>>.



**2009 Crop Management Workshops** - (*John Obermeyer*)

**The 2009 Crop Management Workshop meeting locations and dates are:**

**Valparaiso** - Monday, January 26, Porter County Expo Center

**Bluffton** - Tuesday, January 27, Wells Co. Community Center

**Brownstown** - Wednesday, January 28, Pewter Hall Banquet Facility

**Vincennes** - Thursday, January 29, Beckes Student Union, Vincennes University

**West Lafayette** - Friday, January 30, Beck Agricultural Center

**Credits: 7 CCH Category 1, 4 CCH RT, 7 CEU (4.5 PM, 2 CM, 0.5 NM)**

### Topics:

- (1) 2008 Pesticide Applications - One Step Forward, Two Steps Back!  
Joe Becovitz
- (2) Weeds Bad - Herbicides Good  
Bill Johnson
- (3) Field Crop Insects, They Didn't All Drown  
John Obermeyer
- (4) Getting the Most Out of Soil Testing to Optimize Fertilizer Use  
Jim Camberato
- (5) Are Fungicides Hurting Your Corn?  
Corey Gerber and Bob Nielsen
- (6) Should You Spray? Decision Aids for Fungicide Use in Field Crops  
Greg Shaner and Kiersten Wise
- (7) The Wonderful World of Crop Diagnostics  
Bob Nielsen
- (8) A Flood Response Plan for Agricultural Retailers  
Fred Whitford

To Register online: <<http://www.conf.purdue.edu/crop>> for more information, download the PDF brochure: <<http://extension.entm.purdue.edu/pdf/Broch2008.pdf>>

# Bug Scout



**Bug Scout says, "Don't forget about properly storing your pesticides for the winter!"**

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