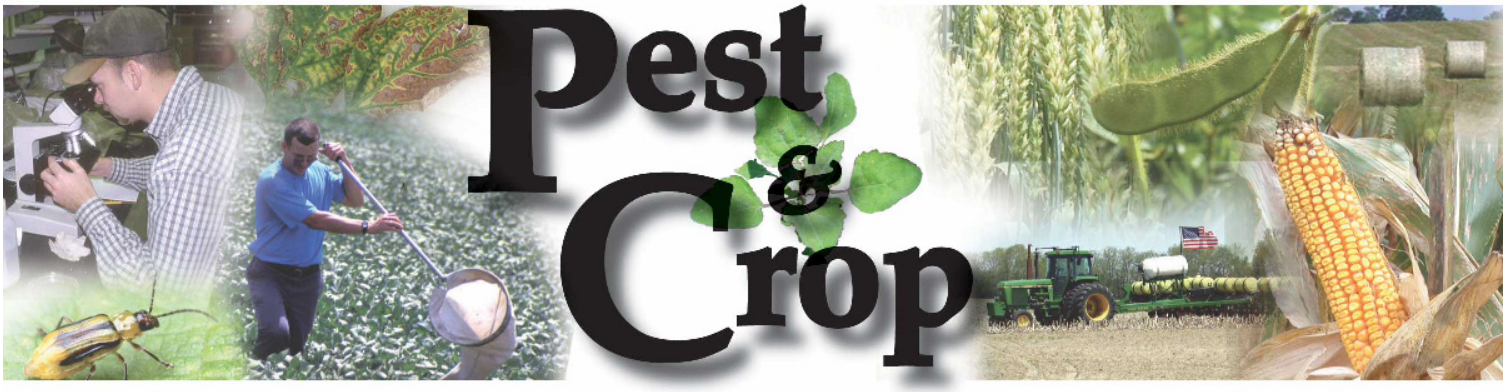


Purdue Cooperative Extension Service

September 21, 2007 - Issue 24

In This Issue

Insects, Mites, And Nematodes

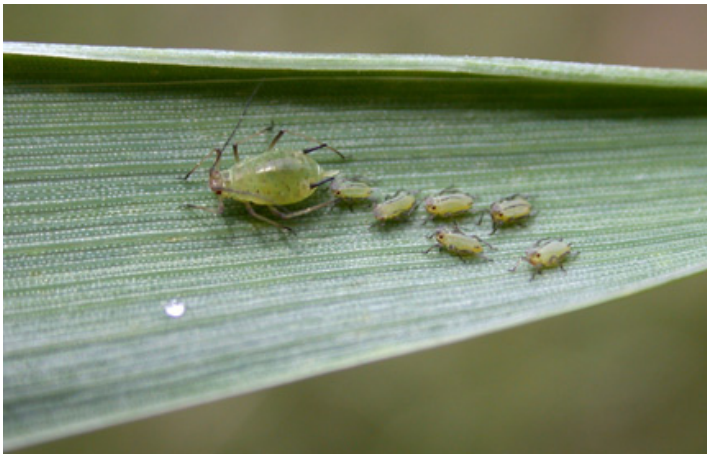
Aphids in Fall Seeded Wheat – (*Christian Krupke, John Obermeyer, and Larry Bledsoe*)

- Aphids commonly infest wheat during fall.
- Aphids can be carriers and vectors of barely yellow dwarf virus.
- Planting after the Hessian fly-free date greatly reduces aphid infestations.
- Treating for aphids, if necessary, should be done within the first few weeks of growth.
- Insecticidal seed treatments offer another control option.

Over the years as wheat management has improved, concerns about aphids in wheat has increased. Aphids have always taken a liking to our fall seeded wheat – it is one of the only high-quality food sources available at that time of year. What is relatively new is the promotion of insecticide applications in late October and even November to control aphids. Much of this comes from producers that have ignored the Hessian fly-free dates for planting in order to get lush, green growth before winter sets in. Obviously, this "greener pasture" is a trap crop for hungry aphids.

Soon after wheat emerges, several aphid species migrate to and feed upon wheat leaves. Aphids suck plant juices with their straw-like mouthparts. This normally has very little effect on the growing plant, as moisture is usually not lacking in the fall. Most of these aphids feed on a variety of host plants, and the problem comes when aphids have first fed on virus-infected grasses and then migrate to wheat, transmitting the disease. The most common virus disease transmitted to wheat by aphids is barley yellow dwarf (BYD). Because of the complexity of BYD and aphid/weather/host interactions, predicting the severity of disease is not possible even in high aphid infestation years.

Aphids stay active, feeding and moving in the fall, as long as temperatures stay at 50ºF or greater. After a killing frost (extended temperatures of ≤32ºF) many aphids die and feeding drops drastically. Some aphids manage to survive even the coldest of winters under clumps of wheat, though their feeding ceases. This is why the incidence of BYD is greatly reduced when wheat is sown after the Hessian fly-free date (see *Pest&Crop #22*, August 31, 2007). This date is based upon the average projected date of killing frosts at various latitudes. These frosts dramatically decrease the numbers of Hessian flies and other insect pests. At the time of this writing (9/20/07), any wheat already planted in Indiana has a greater likelihood of high aphid and Hessian fly infestation.



English grain aphid colonizing and feeding on wheat

Because it is not known from year to year how many, if any, aphids found in wheat are disease vectors, it must be assumed that they all are. Therefore, infestations must be caught and treated within the first few weeks of emergence if BYD is a concern. Treatment thresholds of 2-3 aphids/row foot have been suggested. Treatments late in October and November, even during an Indian summer, may kill aphids, but any BYD will have already been spread – meaning that this amounts to little more than a "revenge spray." In other words foliar insecticides need to be applied before aphid populations build, not good IPM and certainly an economic gamble.

Insecticidal seed treatments (i.e., Cruiser and Gaucho) are available for wheat. Minimal testing has been conducted with these products, though with their systemic activity they may work well against early aphid feeding. However, without detailed studies we cannot say with certainty whether these treatments would result in a net economic benefit. These products are worth considering however, if you meet the following conditions: wheat is under intensive wheat management (100+ bu/A), is a known BYD susceptible variety, is planted before the fly-free date, and/or you are able to accurately predict a warm fall and early winter (good luck with that last one).

Bottom line, early aphid scouting in wheat and planting after the fly-free date are the keys to preventing and/or accurately assessing an aphid infestation and potential risk to BYD transmission and spread. Happy scouting!

What Caused the Ear Damage? – (*Christian Krupke, John Obermeyer, and Larry Bledsoe*)

As corn harvest progresses through the state, some ear feeding damaged has been noticed. Because the worms in question are now gone, most will assume that the western bean cutworm, a recent invader to the state, has caused the damage. But rest assured, corn earworm has not exited the state, but rather had a huge surge in flights this late summer. There is no way to confirm which insect caused damage once they have exited the ear and dropped to the ground for pupation.

Several common misconceptions is that earworm only feed on the ear tip, only one worm per ear may exist, and don't create a hole in the husk on the side of the ear. In fact, earworm, like western bean cutworm, will feed anywhere on the ear, can support multiple worms per ear (earworm are only cannibalistic when they compete for the same space – they prefer eating corn to eating each other), and both can chew a hole in the in the side of the ear or exit out the tip in order to complete their life cycle.

Bottom line, once the worm is missing in damage ears, confirmation of the culprit is not possible. The best you can do is an educated guess based upon field history and climatic factors.

At this point, it cannot be determined what worm caused this damage. Note the exit hole in the husk leaf.

Black Light Trap Catch Report - (*John Obermeyer*)

County/Cooperator	9/4/07 - 9/10/07							9/11/07 - 9/17/07						
	VC	BCW	ECB	SWCB	CEW	FAW	AW	VC	BCW	ECB	SWCB	CEW	FAW	AW
Dubois/SIPAC Ag Center	2	8	26	3	36	15	2							
Jennings/SEPAC Ag Center	0	2	43	0	2	5	0	0	2	9	0	9	3	2
Knox/SWPAC Ag Center	0	1	16	0	15	10	3	0	2	29	0	50	20	2
LaPorte/Pinney Ag Center	0	0	72	0	4	14	2	0	0	7	0	4	6	0
Lawrence/Feldun Ag Center	5	7	26	0	27	42	13	0	4	9	0	5	15	15
Randolph/Davis Ag Center	2	0	8	9	0	5	0	0	0	10	1	1	2	0
Tippecanoe/TPAC Ag Center	1	4	18	0	51	32	1	0	1	16	0	12	2	1
Whitley/NEPAC Ag Center	0	1	71	0	20	4	2							

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

Weeds

Fall-Applied Herbicide Playoffs 2007 – (*Glenn Nice*)

Welcome to The Fall Applied Playoffs, brought to you by the Purdue University Weed Science Team. Playoff results are based on research done at Purdue University from 2003 to 2006. The teams are the management options, for example team 2,4-D Ester + NIS. The games are played against different weed opponent teams, such as Henbit and Horseweed; as the season progresses, opponent teams get stronger. The seasons are 1) April and before, 2) May, and 3) June. A game in a particular season is played by getting a visual control rating on a scale of 0 to 100, 0 being no injury to the opponent team and 100 being complete control of the opponent team. In season one, a win is a weed control rating of 90% or more, in seasons 2 and 3 a win is a weed control rating 80% or more. As you will notice seasons get harder as the season's play progresses. A team's rank in that season is based on number of wins to losses, for example (3-0), the team is 3 and 0, three games played, three wins and no losses. This treatment has been rated three times in that season and has won all three times.

This is a very different, parodied or goofy way to review control data collected over years and locations. What it can do at first glance, like reviewing the perspective stats of your favorite collage football team (possibly Purdue?), is give you some idea as to the consistency of control over time, location, and year. Some locations, like South East Purdue Ag. Center, have problematic weeds such as glyphosate resistant horsetail. These sites often have lower control ratings than other sites. All game scores (data) were taken from research conducted at Purdue University and from Bill Johnson's research program.

So, take a look at the Fall Apply Playoff Rankings and see how your favorite time might compare to others and how they faired against those opponent teams.

PLAYOFF RANKINGS

Team (Fall Applied Herbicide)	Rate/A	Opponent (Weed)	Season (# of Times Rated)		
			1 (April > 89%)	2 (May > 79%)	3 (June > 79%)
2,4-D Ester + NIS	2 pt.	Carolina foxtail Cressleaf groundsel Dandelion Mouse-ear chickweed Smallflower buttercup **SCORE**	4-0 2-0 2-0 2-0 4-0 **1.00**	 **N/A**	 2-0 **1.00**
Autumn + COC + 28% UAN	0.3 oz.	Carolina foxtail Cressleaf groundsel Dandelion Horseweed/marestail **SCORE**	0-4 4-4 3-3 1-4 **0.5**	 3-0 **0.8**	 1-1 3-0 **0.43**
Autumn + COC + 28% UAN	0.6 oz.	Carolina foxtail Cressleaf groundsel Dandelion Horseweed Mouse-ear chickweed Smallflower buttercup **SCORE**	0-4 5-0 3-0 0-5 3-0 5-0 **0.64**	 0-1 **0.00**	 0-2 **0.00**
Autumn + Princep + COC + 28% UAN	0.3 oz. 1 qt.	Carolina foxtail Cressleaf groundsel Dandelion Horseweed/marstail Mouse-ear chickweed Smallflower buttercup **SCORE**	1-1 3-0 1-0 1-1 1-0 3-0 **0.83**	 **N/A**	 **N/A**

PLAYOFF RANKINGS CONTINUED

Team (Fall Applied Herbicide)	Rate/A	Opponent (Weed)	Season (# of Times Rated)		
			1 (April > 89%)	2 (May > 79%)	3 (June > 79%)
Autumn + glyphosate + AMS	0.3 oz. 0.56 lb. a.e.	Carolina foxtail Cressleaf groundsel Dandelion Horsewed/marstail Mouse-ear chickweed Smallflower buttercup **SCORE**	4-0 5-0 3-0 3-2 3-0 5-0 **0.92**	 1-1 **0.5**	 0-1 0-3 **0.00**
Autumn + Sencor + COC + 28% UAN	0.3 oz. 10 oz.	Caroina foxtail Common chickweed Cressleaf groundsel Dandelion Horseweed/marestail Mouse-ear chickweed Pennycress, field Smallflower buttercup Speedwell **SCORE**	4-0 1-0 5-0 3-0 3-3 3-0 N/A 5-0 N/A **0.88**	 1-1 1-3 0-1 0-1 **0.25**	 0-1 0-4 0-1 **0.00**
Canopy EX + glyphosate + 2,4-D Ester + AMS + NIS	2 oz. 0.77 lb. a.e. 1 pt.	Common chickweed Horseweed Pennycress, field Speedwell **SCORE**	1-0 1-0 **1.00**	3-0 1-1 2-0 1-0 **0.88**	 2-0 2-0 **1.00**
Canopy EX + Valor + 2,4-D Ester + NIS	1.0 oz. 2 oz. 2 pt.	Common chickweed Cressleaf groundsel Dandelion Horseweed Purple deadnettle Wild garlic **SCORE**	2-0 2-0 2-0 2-0 2-0 0-2 **0.83**	 2-0 **1.00**	 **N/A**
Classic + Banvel + COC	1.5 oz. 1 pt.	Common chickweed Horseweed Pennycress, field Speedwell **SCORE**	1-0 1-0 **1.00**	2-0 1-1 1-0 1-0 **0.83**	 1-0 1-0 **1.00**
Express + 2,4-D Ester + COC + AMS	0.3 oz. 1 pt.	Common chickweed Henbit Horseweed Purple deadnettle **SCORE**	2-0 2-0 2-0 1-0 **1.00**	 	0-1 0-1 0-1 **0.00**
Princep + 2,4-D Ester + COC	1.8 pt. 1 pt.	Carolina foxtail Common chickweed Cressleaf groundsel Horseweed Mouse-chickweed Purple deadnettle Smallflower buttercup **SCORE**	2-0 2-0 2-0 0-1 1-0 2-0 2-0 **0.92**	 **N/A**	 **N/A**

PLAYOFF RANKINGS CONTINUED

Team (Fall Applied Herbicide)	Rate/A	Opponent (Weed)	Season (# of Times Rated)		
			1 (April > 89%)	2 (May > 79%)	3 (June > 79%)
glyphosate + 2,4-D Ester + AMS	0.77 lb. a.e. 1 pt.	Carolina foxtail Common chickweed Cressleaf groundsel Horseweed Mouse-chickweed Pennycress, field Purple deadnettle Smallflower buttercup **SCORE**	2-0 2-1 1-1 0-2 1-1 2-0 2-0 **0.67**	 0-2 0-2 0-1 0-1 **0.00**	 1-0 0-1 0.5
glyphosate + 2,4-D Ester + AMS	0.5 lb. a.e. 1 pt.	Carolina foxtail Common chickweed Cressleaf groundsel Dandelion Horseweed Mouse-chickweed Pennycress, field Smallflower buttercup Speedwell **SCORE**	4-0 1-0 3-0 3-0 2-4 3-0 4-1 0-1 **0.78**	 0-1 1-3 0-1 0-1 **0.14**	 0-1 0-4 0-1 **0.00**
glyphosate + 2,4-D Ester + AMS	0.5 lb. a.e. 2 pt.	Common chickweed Dandelion Henbit Horseweed Purple deadnettle **SCORE**	2-0 0-2 1-0 1-0 1-0 **0.71**	 **N/A**	 1-1 **0.5**
glyphosate + 2,4-D Ester + Scepter + AMS	0.77 lb. a.e. 1 pt. 2.8 oz.	Carolina foxtail Common chickweed Cressleaf groundsel Horseweed Mouse-chickweed Purple deadnettle Speedwell **SCORE**	2-0 3-0 2-0 0-1 2-0 3-0 2-0 **0.93**	 1-0 1-1 1-0 **0.75**	 0-1 **0.00**
glyphosate + AMS	0.77 lb. a.e.	Carolina foxtail Common chickweed Cressleaf groundsel Horseweed Mouse-chickweed Purple deadnettle Smallflower buttercup **SCORE**	2-0 1-1 2-0 1-1 2-0 1-1 2-0 **0.78**	 **N/A**	 **N/A**
glyphosate + AMS	0.5 lb. a.e.	Carolina foxtail Cressleaf groundsel Dandelion Horseweed Mouse-chickweed Smallflower buttercup **SCORE**	2-0 2-0 1-3 2-1 2-0 2-0 **0.73**	 1-0 **1.00**	 0-2 0-1 **0.00**
glyphosate + Valor + 2,4-D Ester + AMS	0.77 lb. a.e. 2 oz. 1 pt.	Cressleaf groundsel Dandelion Horseweed Mouse-chickweed **SCORE**	3-0 1-1 2-1 1-0 **0.78**	 1-1 **0.5**	 0-1 **0.00**

PLAYOFF RANKINGS CONTINUED					
Team (Fall Applied Herbicide)	**Rate/A**	**Opponent (Weed)**	**Season (# of Times Rated)**		
			1 (April > 89%)	**2 (May > 79%)**	**3 (June > 79%)**
Scepter + WeedMaster + AMS + NIS	2.8 oz. 2 pt.	Carolina foxtail Common chickweed Cressleaf groundsel Dandelion Horseweed Mouse-chickweed Pennycress, field Purple deadnettle Smallflower buttercup Speedwell **SCORE**	0-2 3-0 4-0 2-0 2-2 2-0 2-0 2-0 **0.80**	 2-0 1-3 0-1 0-1 **0.78**	 1-1 0-1 **0.33**
Sencor 75DF + 2,4-D Ester	15 oz. 2 pt.	Common chickweed Henbit Horseweed Purple deadnettle **SCORE**	2-0 1-1 2-0 1-0 **0.80**	 **N/A**	0-1 0-1 1-0 **0.50**
Valor + 2,4-D Ester + NIS	1-2 oz. 1-2 pt.	Carolina foxtail Common chickweed Cressleaf groundsel Horseweed Mouse-chickweed Purple deadnettle Smallflower cuttercup **SCORE**	3-3 3-0 4-0 0-1 4-0 3-0 6-0 **0.85**	 1-0 1-0 **1.00**	 **N/A**
Valor + glyphosate + AMS + NIS	2 oz. 0.5 lb. a.e.	Common chickweed Purple deadnettle **SCORE**	1-0 1-0 **1.00**	0-1 1-0 **0.5**	

The opposing team ranks are based on opposing teams wins. An opposing team win is a loss for us. An opposing team has won a game when control is less than 90% in season one (April and before April ratings), less than 80% control in season 2 (May), and less than 80% in season 3 (June). For example, in season 1 (ratings in April and before) Carolina foxtail had 14 wins and 30 losses across all teams. This is an indication of how hard a weed might be to control.

Opposing Teams Ranks						
Season	1	2	3	**1**	**2**	**3**
Carolina foxtail	14-30	N/A	N/A	**0.32**	**N/A**	**N/A**
Common chickweed	2-27	5-10	2-0	**0.07**	**0.33**	**1.00**
Cressleaf groundsel	5-49	N/A	0-2	**0.09**	**N/A**	**0.00**
Dandelion	9-24	0-2	6-2	**0.27**	**0.00**	**0.75**
Henbit	1-4	N/A	2-0	**0.25**	**N/A**	**1.00**
Horseweed	29-26	17-12	18-9	**0.52**	**0.59**	**0.67**
Mouse-chickweed	1-30	N/A	N/A	**0.03**	**N/A**	**N/A**
Pennycress, field	N/A	4-3	4-3	**N/A**	**0.57**	**0.57**
Purple deadnettle	1-19	0-3	N/A	**0.05**	**0.00**	**N/A**
Smallflower buttercup	1-37	1-0	N/A	**0.03**	**1.00**	**N/A**
Speedwell	1-2	3-2	N/A	**0.33**	**0.60**	**N/A**
Wild garlic	2-0	N/A	N/A	**1.00**	**0.00**	**N/A**

Agronomy Tips

Variety Selection and Seeding Rate for Soft Red Winter Wheat - (*Charles Mansfield Agronomy Department*)

- Plant high quality seed of several varieties.
- Adjust seeding rate according to seed size.
- Optimum plant population is around 30-35 plants/ square foot.
- Plant timely and observe Hessian fly-free date.

When choosing among the many public and private wheat varieties that are available, select those varieties that have the combination of traits that best fit your production system. In addition to yield, certain traits dealing with disease resistance, winterhardiness, and earliness are important. It is likely that not any one single variety will contain all the traits that you consider important. Therefore, plant several varieties to help spread the risk associated with the various diseases and environmental stresses of your area. Information on southern Indiana variety trial can be obtained from the Warrick County Web site <http://www.ces.purdue.edu/warrick/ag>. Click on the **Crop Production Plots** link to get variety trial results. There is also a link to variety trails in other states at the **Purdue Crop Performance Program** link on that page.

Seed can be saved from the previous season if it is high in quality and not contaminated with seed borne diseases like smut. Seed should be professionally cleaned to remove light, shriveled, low quality kernels. A seed treatment can also be applied. Good quality seed should have at least 85 to 90% germination.

The seeding rate for soft red winter wheat should be adjusted for seed size. Seed size can vary from less than 12,000 seeds per pound to more than 16,000 seeds per pound. Accordingly seeding rates vary from as little as 90 lb./acre for very small seeded varieties to as much as 165 lb./acre for large seeded varieties (see table). Optimum plant population is around 1.3 to 1.5 million plants/acre. Assuming 85-90 % field emergence this can be achieved by planting 1.5 to 1.7 million seeds per acre. The higher rates are especially important for late-planted wheat (i.e., more than 3 weeks after the Hessian fly free date).

Seed should be sown ¾ to 1 ½ inches deep. This becomes especially important in no-till situations with heavy residue. It is important to get the seed through the residue and into the soil to assure good seed to soil contact and subsequent uniform germination and emergence. Wheat will be more winter hardy and less susceptible to winter heaving if well established by proper seeding in a timely manner. Adequate nitrogen and phosphate fertilizer is also important for seedling establishment in the fall. Apply approximately 20 to 25 lb. N/acre and phosphate fertilizer according to soil test. Potash is important for later growth and development and should also be applied according to soil test.

Wheat should be sown in a timely manner, but not before the Hessian fly-free date. The optimum planting window for wheat is the two-week period following the Hessian fly-free date. The fly-free date ranges from September 22 across the northern tier of Indiana counties to October 9 in the southwestern corner of the state. In addition to dodging the Hessian fly, planting in this window reduces the risk of several diseases. For example, wheat that is planted early is at risk of being exposed to high aphid populations that can transmit Barley Yellow Dwarf virus. Early planted wheat could also succumb to winterkill if it gets too much fall growth prior to dormancy. Late planted wheat (more than 3 weeks after the fly-free date) may be predisposed to winter die back and increased susceptibility to heaving.

Seeding Rates for Winter Wheat Based on Seed Size*

		---------Desired Population--------		
Number of seeds/lb.	Seed Size	1.1[a] 25[b]	1.3[a] 30[b]	1.5[a] 35[b]
		----------lb. seed/acre----------		
10,000	large	120	145	165
12,000	large	100	120	140
14,000	medium	85	100	120
16,000	small	75	90	105

* Seeding rates adjusted to 90% field emergence.
[a] million plants/acre
[b] plants/square foot

Weather Update