OSU OKLAHOMA COOPERATIVE EXTENSION SERVICE

WHEAT PRODUCTION NEWSLETTER

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Hessian fly reported in Oklahoma wheat

By *Dr. Tom Royer, OSU Extension Entomologist*

Hessian fly has been found in several wheat fields in north central Oklahoma this winter. It is a major pest of wheat, but major infestations are unusual in Oklahoma, probably due to the drier environment that exists in most growing years. Since this winter was unusually wet and mild, it may have provided better conditions for fly survival. These flies have already done their damage, and are now resting and waiting for spring to re-infest the field. Unfortunately there is little that a producer can do to control spring infestations of Hessian fly.

The adult Hessian fly is tiny, about one-eighth of an inch long, and resembles a gnat. The damaging stage is the larva, which is a shiny, white headless and legless maggot that measures up to 3/16 of an inch. When mature, the larva forms a 1/8 inch long dark brown puparium that looks like a grain of rice and is commonly referred to as a "flaxseed".

There are 2 main generations that occur, one in the fall and another in the spring. Larvae injure the wheat by feeding on stem tissue at the crown of young plants or just above the nodes of jointed wheat. During a fall infestation, young infested plants become dark-green to bluish green in color and are stunted with thickened leaves. Often, secondary tillers fail to develop. To confirm an infestation, the plant and roots should be removed from the soil and inspected for maggots or flaxseeds by gently pulling the leaf sheath away from the stem and examining the crown area. In a spring infestation, the stem is often injured, and will lodge. A heavily infested field looks like it has suffered hail damage. In such fields, the lodged plants nearly always contain flaxseeds that are inserted at the first joint of the stem, just under the leaf sheath.

Control

Delayed Planting: As stated earlier, Hessian fly infestations are rare in Oklahoma, probably due to the drier environment that exists in most of the wheat belt. In many wheat areas, there is an established "fly free" planting date to use as a guide for planting. If the field is planted after the fly free date, there is little likelihood that the field will be infested. The fly-free date is tied to the occurrence of average killing frosts. Unfortunately, killing frosts can occur so late in Oklahoma that it becomes impractical to delay planting long enough to plant in the "fly free" date. Even so, if fields are planted later, say in October, the risk of a fall infestation will be reduced.

Resistant Varieties: There are 16 known biotypes of Hessian fly. If the most prevalent biotypes of the Hessian fly are known, resistant varieties can be planted. Typically, we have the "GP" biotype in Oklahoma, but that could easily shift over time. I will collect some samples from several of the infested fields and send them to Kansas State University to be identified to biotype. Once the biotype is identified, I may be able to suggest some resistant varieties that can be considered for planting in infested areas.

Clean Tillage: Hessian fly infestations are associated with continuous wheat, which occurs over much of Oklahoma. Infested wheat stubble should be buried at least two to four inches below the

surface. Volunteer wheat should be destroyed as soon as possible if summer rains stimulate germination in the field.

Chemical Control: Seed can be treated with Gaucho or Cruiser insecticide to control fall infestations. There is no effective insecticide control for spring infestations; however, researchers in Georgia have obtained some control by timing a Warrior insecticide application to coincide with spring emergence of adult flies.

The best option for early-planted wheat intended for grazing is to consider using a resistant variety or have the seed treated with insecticide. Either resistant varieties or seed treatment will reduce the incidence of a fall infestation, and resistant varieties help with spring infestation as well. Seed treated with Gaucho or Cruiser has a 45 day grazing restriction, but that should not be a problem, since it often takes that long to get wheat mature enough to graze.

Wheat disease update

By *Dr. Bob Hunger, OSU Extension Wheat Pathologist*

Wheat leaf rust has continued to persist since my last update in mid-November 2004. A couple of strong cold spells have helped reduce infected leaves and inoculum, but my examination of field plots the week of January 3 here at Stillwater revealed numerous spore-producing lesions still present on lower leaves. Combining this inoculum with free moisture and mild temperatures that have occurred between the cold snaps will promote infection of the younger, green foliage although pustules will be slow to develop. These are exactly the type of conditions needed to allow leaf rust to overwinter in Oklahoma. Similar observations of leaf rust have been reported from Gary Strickland (County Extension Educator Jackson County) in southwestern Oklahoma wheat fields. Additionally, Dr. Stephen Harrison (small grains breeder at Louisiana State University) has reported finding active wheat leaf rust on both old and new leaves in observation plots in Louisiana. Further, the weather was extremely conducive for continued sporulation, spread and development of leaf rust.

The only addition to the reports on wheat leaf rust is a sample of 2174 from north central Oklahoma that tested **positive for wheat streak mosaic virus**. Watch for symptoms of WSMV and/or High Plains Virus (HPV) this coming spring as there were numerous reports and confirmations of both of these viruses during the fall in Oklahoma and Texas.

Nitrogen applications are underway

By *Dr. Jeff Edwards, OSU Small Grains Extension Specialist*
and Hailin Zhang, OSU Nutrient Management Extension Specialist

With wheat green-up rapidly approaching, Nitrogen (N) rates and application timings are on the minds of many producers. Determining the correct top-dress N application for wheat is a dynamic decision that is influenced by several factors and is specific for each individual farming operation. Therefore, in publications such as this we must make some generalizations and rely upon you, the producer, to decide how to apply the techniques and recommendations to your operation. Given this caveat, let us discuss some criteria that should be considered in making decisions about applying N.

1. ***When should I top-dress?***
   Simply put, there is no clear-cut answer to this question. From a practical standpoint, the best time to top dress is when you can get the work done. Growers with soil types that are typically

hard to get across, need to cover a large amount of acreage, or who rely on custom applicators that have a large acreage to cover will need to get started early and perform top-dress operations when conditions allow.

Early applications of N will encourage tillering, and will be most beneficial for later-planted wheat that has not had as much opportunity to tiller and for growers whose primary emphasis is forage production. Wheat that is large in size and has a lush-green appearance when emerging from winter dormancy can generally tolerate a small amount of N deficiency stress. This is because we only require approximately 500 heads per square yard at harvest to achieve optimal wheat yield. At a one bushel seeding rate there will be approximately 200 plants emerge per square yard, so we only need around 2-3 tillers per plant for optimal yield. Most of our early-planted wheat fields in Oklahoma are well past this number, so loss of a few tillers should not affect final grain yield.

Research has indicated that timing of spring N applications will have minimal effect on wheat yield. However, studies agree that N application should be made at or prior to Feekes growth stage 6 (Feekes GS 6is identified by a visible hollow stem and node above the soil surface), as effectiveness of N applications past this point are diminished. It is also important to remember that rainfall will be required to move N into the soil profile.

2. ***What is the best form of top-dress Nitrogen to use?***

There are three issues to consider here, and I would consider them in the following order:

   a. ***which can be applied in a uniform fashion?***

      Both liquid and granular top-dress N can be applied uniformly across a wheat field; however, both can result in a streaked wheat field as well. The important thing to remember here is that properly applied N costs no more that improperly applied N, so uniform application is essential to obtain the most bang for your buck.

   b. ***which is the cheapest source per unit N?***

      The most common forms of top-dress N used in Oklahoma are UAN solutions (28, 30, and 32% N), urea (46% N), and ammonium nitrate (34% N). The only fair way to compare product prices is to compare the cost per unit N. An example for how to do this is shown below:

Table 1. Comparing the prices for different N sources

	Urea		28% UAN	
Percentage N	46%		28%	
	2000		2000	
Actual N in a ton of product	920		560	
Price per ton		$285		$185
	÷	920	÷	560
Price per unit N		***$0.31***		***$0.33***

   c. ***what are the weather conditions?***

      The first issue to consider is "burn" that can occur when broadcast applying large amounts of liquid UAN fertilizers to actively growing plant tissue, which results is desiccation of wheat leaves. I am not aware of any published research regarding yield losses associated with N "burn", but any potential for yield loss would be more likely for wheat that is past the tillering stage. If leaf burn is a concern, then liquid N should

be dribbled on using stream bars or granular N should be applied.

3. ***How much N should I apply?***
Winter wheat N demands are met both by N mineralized from soil organic matter and from fertilizer sources applied by the producer. For years, the standard OSU recommendation was two pounds of N for every bushel of yield potential. Using this strategy, it is necessary for the producer to soil sample to determine the amount of N in the soil profile and then provide supplemental to-dress N to bring the total amount up to the two pounds per bushel level. In addition, dual-purpose wheat (wheat used both for grazing and grain production) will require additional N to replace N removed as beef. In other words, two pounds of N are still needed to produce one bushel of grain, but 30 lbs. N are needed to produce 100 lbs. of beef or 1000 lbs. of forage grazed**.** Use the table listed below to calculate the N needs for your operation:

Table 2. Determine your N needs by subtracting N credits from N requirements

	Example		Your Farm	
		N budget		N budget
		---lb/ac---		
Yield goal * 2	= 50 bu * 2	100		
Beef removed[1]	= 200 lb * 0.3	60		
N required		**160**		
Soil test N			30	
Fall applied N			80	
N Credits			**110**	
	160 lb required			
	-110 lb credit			
Top-dress N to apply	***50 lb/ac***			

[1] N removed for forage production is replenished at a rate of 30 lb of N for every 100 lb of beef removed (i.e. 0.3 * lbs of beef removed).

While this methodology is much better than guessing the proper amount of N to apply, OSU researchers have developed a much better method called the GreenSeeker system. This method compares sensor measurements from an area treated with normal practices to measurements from a strip where plant N is not limiting (generally 2 times the regular amount of N was applied the prior fall). A top-dress N rate recommendation is then generated based on a predicted yield potential and the "greenness" of the crop. For more information, contact your county Ag extension agent.

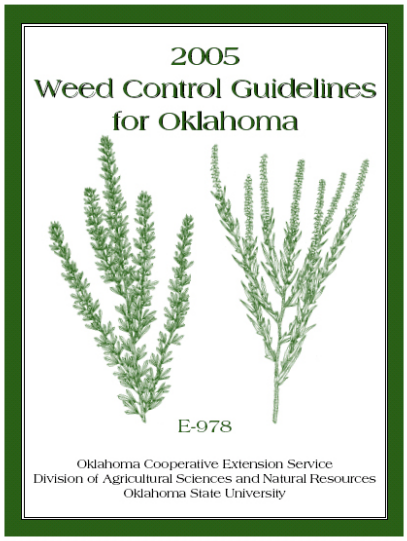
2005 *Weed Control Guidelines for Oklahoma* release

By *Dr. Case Medlin, OSU Extension Weed Specialist*

The 2005 Weed Control Guidelines for Oklahoma has been release and is available for purchase. The guide contains weed control information in most agronomic crops produced in Oklahoma. Weed control areas in the publication are specific for alfalfa, brush, canola, corn, cotton, pasture and rangeland, peanut, sorghum, soybean, and wheat. For each "crop" there is an efficacy chart to "rank" the various herbicides by weed species present in the field, a rotational restriction table to inform producers of the amount of time that must transpire between herbicide application and the planting of rotational crops, and a brief summary of the herbicide label including trade names, formulations, and primary use restrictions.

Also contained in the 100 plus page document are calibration instructions and tips for proper herbicide application. To recover the printing cost for the document, each copy will cost $10. Please send checks **payable to Oklahoma State University Plant and Soil Sciences** to the following address. Be sure to include a return address.

Oklahoma State University
Plant and Soil Sciences Dept.
Att: Case R. Medlin
279 Agriculture Hall
Stillwater, OK 74078



Upcoming events

January 20, 2005 – Hard White Wheat Summit. 8:30 am, Texas County Activities Center, Guymon, OK.

January 21, 2005 - Wheat Pasture Field Day. 11:30 to 2:30 pm, at the Wheat Pasture Research Unit, intersection of Hwy. 51 and 74, Marshall, OK

February 1, 2005 – Bunch for Lunch Meeting, 12:00 Noon at Alva. Contact the Woods County Extension office for more info.

February 15, 2005 – Winter Crop School. 6:00 to 9:00 pm, at the Afton Vo-Tech building, ½ mile north of the Will Rogers Turnpike on Hwy. 69. RSVP at the Ottawa Co. Ext. Office 918-543-1688

Subscription information

The *Wheat Production Newsletter* is published in electronic format on an as needed basis throughout the year. To receive an electronic copy in pdf format, send an email with **subscribe** as the subject line to jeff.edwards@okstate.edu

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