UK COOPERATIVE EXTENSION SERVICE
University of Kentucky – College of Agriculture

LEXINGTON, KY 40546

UNIVERSITY OF KENTUCKY WHEAT SCIENCE NEWS

Research & Education Center,
Princeton, KY 42445

Volume 8, Issue 4 August 2004

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PRE-SEASON CONSIDERATIONS FOR INSECT CONTROL IN WHEAT

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It is time again to begin thinking about insect control in our wheat crop. In many cases you have probably already given consideration to such items as variety selection, seeding rates and tillage. Certainly pest control should also have your attention as decisions made before planting will have an effect on insect populations for the entire wheat growing season.

Without doubt, one of the most important decisions you will make is that of planting date. This choice will shape all of the pest decisions you will have to make in the fall and may even impact your spring season. Do not treat it lightly. Planting date will directly affect all three of Kentucky's possible fall pests.

Another pre-season decision will be whether or not to use an insecticide seed treatment. This technique, when used in Kentucky wheat culture, is aimed primarily at controlling the aphids that spread the Barley yellow dwarf virus. However, at present, these treatments must be applied by specialist seeds men and the time needed to get this done requires booking seed well in advance of planting.

Fall Armyworm - an unusual, but certainly possible, fall foliage feeder on small grains. Fall armyworm (FAW) is already in the area having lived on corn, sorghum and wild grass hosts since about July. Early planting and a late mild fall will favor this pest. FAW could survive until heavy frost. In general, FAW will eat off the above ground portions of the plant and do little lasting damage. There are no thresholds for control of this pest in small grains. Control should not be difficult, but the decision as to whether or not to make a spray is not at all clear. One thing is for sure, most plants will come back even if all the above ground parts are eaten, so producers are advised not to replant without considerable evidence that the original stand is damaged. Replanting usually results in a "double stand", which in turn, results in severe lodging and other problems.

Hessian Fly - has not traditionally been considered a major pest of Kentucky's small grains. Unfortunately, that may be because we have never looked very hard. To get a better idea of how this insect affects Kentucky's crops see Entfact-101. However, from an immediate practical standpoint, there are only a few things you can do to manage for this insect. **Again, the most**

important is planting date. This is the insect for which the term "Fly Free Date" was coined. In general, crops planted after this date will not be infested with Hessian fly. In Kentucky, the date varies from about Oct 10 in the northern wheat growing counties to Oct 15 in the southern tier of counties (See Entfact-101, ENT-56). In addition, it is important to pay strict attention to all agronomic practices and variety selection that will produce strong, vigorous plants that stand well. Though resistant varieties will help, (and should be used if other plant characteristics are appropriate for your management plan) the populations of this pest found in Kentucky are able to break all the deployed resistance.

Aphid Complex and Barley Yellow Dwarf - This is, without doubt, the most contentious problem we have to face. Though it is important to remember that the insect feeding itself is unimportant, the transfer of Barley Yellow Dwarf Virus (BYDV) is extremely important. Once again, however, you have a very good management tool for avoiding the problem -- planting date. Though it is not absolute, as one plants later, the chances of a problem with transmittal of BYDV decrease. Though there is no definable calendar date for avoiding BYDV, the "Hessian Fly Free" makes a good compromise.

Beyond planting date, the fall weather will be the next most important factor in decisions concerning aphids and BYDV. Certainly, we would like to see the fall cool down to reduce the survival of incoming aphids and to slow the movement of aphids in the field. Producers/consultants should be on the lookout for aphids, especially in the first 30 days after planting. The earlier aphids appear the more problem one would expect from BYDV.

So, if you need control, how do you obtain it? Some producers are using the seed treatment technology to get a jump on the aphids. This has both advantages and disadvantages.

Disadvantages:
- You must decide well ahead of time if you are going to use it so the seed can be booked and the applications made.
- You will probably not be able to return unused seed.
- The cost of the “application” may well be greater than the cost of a foliar application.
- The product may not last the entire time of aphid activity (especially in a warm fall and winter)

Advantages:
- Protection is available from the time the plant emerges.
- Protection is continuous and lasts a great deal longer than an individual foliar application.
- Early in the season you do not have to worry about scouting to schedule an application.

If you choose the wait and see position of using a foliar applied rescue application, you are likely to hear the continuing discussion about how many aphids should be present before there is a need to spray. In the past, scientific literature has suggested about 10 aphids per row foot. Many consultants think that 5 aphids per row foot are more appropriate. Additionally, there is some new research from Georgia that suggest (at least in the deep south, in the first 30 days post plant) that three aphids per row foot is the appropriate number. At present we recommend a threshold of: 3 aphids per row foot for the first thirty days post emergence; 6 aphids per row foot for the 2nd thirty days post emergence; then 10 aphids per row foot until temperatures are generally below 48^{o}F.

Variation from poor sampling, or too little sampling, will completely wipe out any precision gained by having a more refined threshold, **- AND -** this will still not address whether or not the aphids are carrying the virus!

Fall control of aphids designed for control of BYDV will remain a difficult decision for a while yet. However, I think the following factors still deserve your consideration.

A. Factors to consider when deciding on foliar insecticide intervention.

1. Factors that do not favor attempting insecticidal control of aphids.

- Planting after Hessian Fly free date.
- Hot, dry preceding summer.
- Cool fall.
- Aphid numbers below 10 per row foot.
- Cold winter, little snow cover.
- Late occurring, cool following spring.
- Non-intensive management of other factors.

2. Factors that favor attempting insecticidal control of aphids.

- Planting before Hessian Fly free date.
- Normal summer temperatures with adequate rainfall.
- Late, warm fall.
- Aphid numbers greater than 10 per row foot.
- Mild winter or snow cover.
- Early warm-up in the following spring.
- Intensive Wheat Management.

Likely Outcomes -

1. In epidemic years, sprays may pay for themselves, but will not likely protect the maximum yield potential.

2. In years of slight BYD, sprays will cost the producer.

3. In intermediate years, sprays will pay for themselves and a larger percentage of the potential yield will be protected.

4. Planting after the Hessian Fly free date is worth one spray, possibly two.

5. There are some years where the effect of spring infection/movement is economically important. However, fall infection appears to be far more important. With both the seed treatment and fall foliar application, it is possible that a late winter early spring application will be needed. This is likely to depend upon how “late” warm fall weather extends and the “mildness” of the winter.

6. In the long term, obtaining the ability to predict or at least estimate disease severity, will be the most important management tool for producers.

You might want to review a previous article (listed below) that illustrates the difference between incidence of symptoms and yield protection and the cost / benefit of yield protection. Johnson, D. and L. Townsend. Can Aphid Control Reduce Barley Yellow Dwarf Incidence In Wheat? A case study (Caldwell Co., KY 1998-99) Kentucky Pest News No. 862, 13 Sept. 1999. http://www.uky.edu/Agriculture/kpn/kpn_99/pi990913.htm

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http://www.uky.edu/Agriculture/Entomology/entfacts/pdfs/entfa101.pdf

Aphids and Barley Yellow Dwarf (BYD) in Kentucky Grown Wheat**.** Entfact-121.
http://www.uky.edu/Agriculture/Entomology/entfacts/pdfs/entfa121.pdf

IPM- 4 Kentucky Integrated Crop Management Manual for Field Crops - Small Grains
http://www.uky.edu/Agriculture/IPM/manuals.htm

Wheat Seed Quality Concerns

Don Hershman, Dennis TeKrony and Chad Lee

Farmers are questioning the quality and availability of wheat seed following a season where Fusarium head blight (i.e. head scab) was a problem across Kentucky. The level of severity of Fusarium head blight appears to be similar to that of 1991.

As in 1991, Fusarium head blight caused widespread seed quality problems and limited supplies of high germination seed available for fall planting. Seeds infected by Fusarium sp. are either dead (called tombstones) or shriveled to plump in appearance, which results in a wide range in seed germination and vigor. The wheat seed industry have overcome the situation by severely conditioning seed lots, including seed treatment with various seed treatment fungicides effective against seed-borne Fusarium sp. infection.

The UK Seed Testing Laboratory has reported low germination in wheat seed lots produced in Kentucky. Approximately 300 seed lots have been tested by the lab in 2004 and the average germination for those samples was 70%, with a range of 31 to 96%. As a comparison, certified wheat seed is required to have a germination greater than 85%. However, only 16% of the seed lots had germination rates at or over this 85% level. As a result, Kentucky seed producers and farmers are faced with a major seed quality problem for fall planting.

The UK Seed Laboratory apply the fungicidal seed treatment of Raxil-Thiram to many seed lots and it improved germination by an average of 15 percentage points. The range in improvement was a 0 to 50 percentage point increase in germination. This resulted in over half of the seed samples tested germinating at or above 85%. Even though seed treatments improved germination in almost all seed lots, many of the seed lots still had germination rates less than 85%.

Farmers who routinely save wheat seed for replanting are at greatest risk of planting seeds infected with Fusarium sp. These seeds are both lower in seed germination and smaller in seed size. This is the year that all bin-run seed should be tested, conditioned and treated before planting. Kentucky seed companies have reported up to a 30% cleanout of scabby, light seed and routinely have it tested for germination and may need to have it conditioned and treated to improve germination and field stands.

The testing data this year and in the past years clearly indicates that many seed lots with a low germination rate will respond favorably to conditioning, followed by treatment with one of the new generation seed treatment fungicides. Dividend and Raxil-Thiram are two such commonly-used fungicides. Both fungicides should be applied by approved certified seed conditioners who have the appropriate equipment to thoroughly treat wheat seed with low fungicide rates.

Wheat seed germination and stands should not be a major issue this fall provided that producers seek out and plant seed that has been properly conditioned, treated (if necessary), and tested for germination by an approved seed testing laboratory.

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