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Wheat Science At UK

The first issue of Wheat Science serves as an introduction to the Wheat Science group at the University of Kentucky. Most of the members of this group are familiar to you, but just to be sure, the members of our Wheat Science group and their areas of expertise:

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And introducing the newest member of our team,

Dottie Call --- Wheat Science Coordinator
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Dottie is in charge of our Newsletter, field days, and generally coordinating our efforts to serve the wheat producers of Kentucky more effectively. She comes to this assignment from a similar post with the CRP program at Princeton. If you have questions about upcoming field days, on-going research or wheat in general, contact Dottie, and she'll make sure that your questions are answered. For e-mail users, a question to our Wheat Science group at large can be sent to: **ipmsmgrn@ca.uky.edu**. (David A. VanSanford)

USDA LIFTS KARNAL BUNT RESTRICTIONS IN SOUTHEAST

Don Hershman, Extension Plant Pathologist

On March 17, 1997 the U. S. Department of Agriculture (USDA) announced that it was lifting all Karnal bunt emergency action notifications currently in place in the Southeast.

You may recall that last fall, USDA/APHIS detected what appeared to be Karnal bunt spores in Tennessee, Georgia, Alabama, and Florida. Since that time, USDA researchers have determined that the fungal spores detected in those states were actually spores from a closely related species which affects ryegrass, but not wheat. Apparently, the "specific" PCR/DNA tests used by APHIS to confirm Karnal bunt was also picking up the ryegrass pathogen. Since no Karnal bunt has been OBSERVED in the southeast, and based on the findings that the ryegrass pathogen does not cause Karnal bunt, the USDA has moved quickly to return the Southeast to business as usual.

In a March 17 press release, USDA assistant secretary for marketing and regulatory programs, Michael V. Dunn, stated that, "at this time we are no longer considering taking further regulatory action in the Southeast". The release goes on to say that in the near future, USDA will publish a standard for determining the presence of Karnal bunt that will apply to all parts of the country. "Establishing this standard will ensure that all U.S. wheat producers and handlers are treated equitably with regard to Karnal bunt and that U.S. wheat has necessary certification to remain competitive in global markets. These actions are consistent with the USDA's objective to protect the U.S. wheat industry while limiting restrictions to areas where Karnal bunt disease occurs", said Dunn.

Remember that Karnal bunt does occur in the western U.S.; we know this because the disease has been observed there. The southeast has, for now, dodged the Karnal bunt bullet.

PREPARING YOUR EQUIPMENT FOR THIS YEAR'S WHEAT CROP

Samuel G. McNeill, Extension Agricultural Engineer

Combines should be tuned up from front to back prior to harvest to avoid potential delays from mechanical breakdown. The most important machine adjustments for harvesting high quality grain are cylinder or rotor speed, concave clearance, screen openings, and fan speed. A review of the working settings used for wheat (seed moisture between 13 and 16.5 %) with several different combines indicate a wide range between machines **(Table 1)**. Refer to the owners manual for specific settings for your combine. Cylinder/rotor speeds normally increase with seed moisture. Once harvest begins, adjust forward speed, cylinder or rotor speed, and fan speed in the field to match ground and seed moisture conditions. Frequently monitor kernels and trash levels in the grain tank and harvest losses in the field to improve threshing and cleaning if necessary.

Table 1. Suggested Initial Combine Settings for Harvesting Wheat.

Combine	Cylinder / Rotor Speed (rpm)	Concave Setting Position/ Distance	*Sieve Openings*			Fan Speed (rpm)
			Chaffer (in)	Tailings (in)	Cleaning (in)	
Case IH 1680	900 - 1000	0 - 1	½	¾	¼	900 - 940
JD 7720	1000	¼ - 1/16″	¾	⅞	⅛	825
JD 9500	820 - 900	3/16 - 5/32″	⅝	¾	3/16	1050 - 1090
MF 8560	950 - 970	0 - 2	¾	⅞	¼	650 - 730
NH TR96	1450 - 1700	1 - 3	¼	--	--	730 - 850

Source: Prairie Agricultural Machinery Institute (PAMI Reports 426, 474, 622, 629, and 631).

Incentives for harvesting wheat early are to prevent weathered grain from losing test weight and quality, to plant double crop soybeans earlier with the hopes of higher yield, and to reduce shatter loss at the header during combining. These benefits usually offset the modest costs of drying high moisture wheat, provided that adequate drying capacity is available to prevent spoilage, sprouting and mold damage. The actual moisture content at harvest depends on the drying system that's available. Guidelines for matching the beginning harvest moisture content to the drying system are given in **Table 2.**

Table 2. Guidelines for Matching Harvest Moisture Content for Wheat to your Drying System.

Drying System	*Moisture Content, %*

High speed dryer	21 - 24
Bin dryers with heat/stirring equipment	17 - 20
Bin dryers without heat	Less than 17

Thoroughly clean out storage bins, augers, pits, truck beds and dryers to eliminate these sources of insect contamination. Sanitation is usually the cheapest means of insect control, but it's often overlooked or given a low priority when folks get busy with other chores. Spray cleaned equipment with an approved insecticide prior to harvest for further protection against weevil and moth infestations.

GROWTH AND TEMPERATURES OF NO-TILL AND CONVENTIONAL WHEAT

Lloyd Murdock, Jim Herbek, and John James
Extension Soils Specialist, Extension Grain Specialist, and Agronomy Technician

No-till wheat sometimes doesn't seem to have the same growth rate in the winter and early spring as that of tilled planted wheat. Sometimes the no-tilled wheat is a little slower to advance growth rate stages, development of a dark green color and exhibits a little less height.

A long-term wheat experiment planted no-till and tilled offered an opportunity to look at growth rates. This was the fifth year for this trial which has a corn-wheat-soybean rotation. The variety of wheat planted this year was Pioneer 2568. The plots were sampled periodically for growth rate **(Table 1)** and temperatures were recorded at 4 heights: 1) one inch below soil surface, 2) at soil surface, 3) two inches above soil surface, and 4) one inch above canopy.

Table 1. Wheat Dry Matter Yield of Two Tillage Systems Taken on Jan. 13 and March 10, 1997

Tillage	Lbs/Acre Dry Matter	
	Jan. 13	*March 10*
Tilled	243	748
No-Till	353	934

The growth rate of no-till wheat was greater this year than tilled wheat. The difference was visible during the late fall and samples taken in January showed a clear advantage to the no-till wheat. The temperatures between the two tillage systems was the same above the ground. However, at the soil surface and one inch below the soil there were differences. As the soil cooled in November and December, the no-tilled soil was warmer by about 2 to 3 degrees F. In January and early February, the temperature was somewhat stable and the tilled wheat soil was about 1 to 2 degrees F warmer than the no-tilled wheat soil. In late February and early March, the soils began to warm and the tilled wheat soils were 2 to 3 degrees F warmer than the no-tilled soils and the differences between the growth rates were reduced, but no-till wheat still had more vegetative cover in early March. There were no differences in color or growth stages between the two tillage systems.

Under the conditions of this trial in 1996-97, the no-till wheat vegetative growth was greater than wheat that had been planted with tillage. The greater growth rate for no-till in the fall and early winter may have been due to some extent to the warmer soil temperatures at and below the soil surface in the no-tilled areas. No-till wheat maintained more vegetative growth during the winter and early spring when the temperatures were slightly cooler under the no-till conditions at and below the soil surface. This seems to indicate that other factors also contributed to more vegetative growth under the no-till conditions.

The authors would like to acknowledge the financial help that was received from the Kentucky Small Grain Growers Association which helped make this project possible.

SPRING APHID OUTLOOK

Lee Townsend and Don Hershman
Extension Entomologist and Extension Plant Pathologist

Aphids found in wheat in the spring are primarily from two sources 1) overwintering survival from last fall's flight and 2) new arrivals from the spring flight. The bird cherry-oat aphid (BCOA) is the predominant fall species.

Prolonged feeding then could reduce winter-hardiness of wheat plants, in addition to infection with Barley Yellow Dwarf Virus (BYDV). The English grain aphid moves into wheat fields in the spring and can carry BYDV, too. In both cases, winged migrants land in the fields, feed some and deposit live young on the plants. Typically, these develop into wingless adults that produce offspring over several generations. Wingless aphids spread gradually in the field by crawling from plant to plant and leaving behind their young.

Spring infestation -The English grain aphid has a spring flight. Winged forms of this aphid arrive around green-up time or later. Mild winters should result in larger spring flights. It also colonizes wheat and can occur on the developing grain heads in numbers sufficient to reduce yields.

Insecticide applications should be made in the spring when field scouting shows significant numbers of live aphids (more than 10 per foot of row). Following this threshold will allow for effective timing of the treatment. The rapid growth of wheat will produce a lot of new leaf tissue that is unprotected from aphids that arrive later in the spring.

The numbers of aphids that wheat plants can tolerate increases as the season progresses. Virginia Tech provides the following guidelines for late spring- 100 aphids/ft of row on 3" to 6" tall grain, 200 on 7" to 10", and 300 or more on 11" or taller plants.

English grain aphids can accumulate on seed heads, causing reduced grain weight and size. An average of 20 or more aphids per head is the recommended treatment guideline for this insect.

HOW BAD ARE CEREAL LEAF BEETLES IN KY?

Lee Townsend, Extension Entomologist

The March 1997 issue of the Cooperative Farmer has a good article on the cereal leaf beetle. A sub-heading refers to this insect as the "Number-One Insect Pest of Wheat". The article reports on treatment threshold work out of North Carolina and Virginia, where the insect has become an important pest during the last 5 years. Cereal leaf beetles are cool season insects that have one generation each year. The adults and larvae are active in late spring, feeding on cereal grains and grasses. After reading this article, it is reasonable to ask, "*Should we worry about cereal leaf beetles in Kentucky wheat*?"

Cereal leaf beetles can be found in Kentucky but numbers have been low. A check of our insect identification records over the past 10 years reveals 16 records between 1982 and 1996 - - 8 were from wheat, 3 from oats, 4 from corn and 1 with no crop indicated. The greatest number received in any single year was 3 in 1987. Generally, there have been only 1 or 2 specimens sent in a year over the past 5 years. The insects have been found in Allen, Barren, Caldwell, Calloway, Fulton, Hickman, Livingston, Logan, Meade, Simpson, Todd, and Wayne counties. The earliest collections were mid- to late April, the latest were mid-June. The June feeding was primarily on corn and was probably from beetles storing some food reserve before going into summer inactivity.

One interesting aspect of defoliation studies associated with the work in the Cooperative Farmer article was the discovery that the two leaves below the flag leaf were important to grain yield as well as the flag leaf. New thresholds for this insect will not focus solely on damage to the flag leaf.

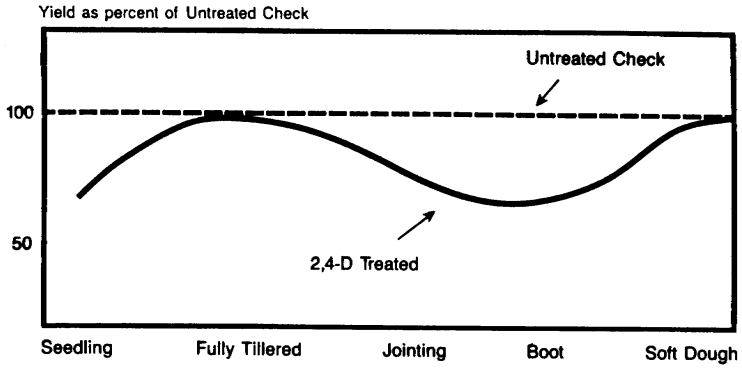
Cereal leaf beetles have been here for some time but have remained below economic levels so far in Kentucky. They are something to keep in mind but have not become a key pest of the crop. Cereal leaf beetles prefer barley and oats so numbers should be expected to be greater near where these cereals have been grown.

LATE SEASON HERBICIDE APPLICATIONS IN WHEAT

James R. Martin, Extension Weed Scientist

This wet season has made it difficult to apply herbicide treatments in a timely manner. As the season progresses, weeds grow larger and become more difficult to control. Many of the cool-season broadleaf weeds are approaching maturity and probably very little will be gained by spraying for these weeds.

The stage of growth of the crop is another issue to consider. Wheat is more prone to injury when 2,4-D or other auxin growth regulator herbicides are applied during rapid plant growth. The following figure illustrates the susceptibility of wheat when plants are treated at different stages of growth with 2,4-D.



Recommended Wheat Growth Stage for Selected Herbicides are Summarized Below:

Herbicide	Recommended Growth Stage of Wheat for Late Winter to Early Spring Applications
Banvel	After dormancy but before jointing.
Buctril	Before boot stage.
2,4-D	After fully tillered but before jointing (usually 4-8" tall).
Harmony Extra	Before flag leaf is visible.
Hoelon	Before first node.
Sencor	After 3 tillers but before jointing.

Pre-Harvest Weed Control in Wheat - Pre-harvest applications are generally not a part of the planned weed control program in wheat. However, there may be instances where pre-harvest applications may enhance the harvesting process and subsequent weed control in double-cropped soybeans. The flooded areas where wheat stands are poor to non-existent may be prime areas for using pre-harvest treatments.

Roundup Ultra and 2,4-D are labeled for applications prior to wheat harvest. The response of weeds to these herbicides is slow and will not occur as rapidly as with certain harvest aid applications used in other crops. **Drift to nearby sensitive crops is a concern when using these treatments.** Some brief comments about these treatments are indicated below: ***Roundup Ultra at 1 qt/A:*** Apply after hard-dough stage (30% or less grain moisture) of wheat and at least 7 days before harvest. Do not apply to wheat grown for seed production due to possible reduction in seed germination or seedling vigor. Wheat stubble may be grazed immediately after harvest. ***2,4-D ester or amine at 1 to 2 pt/A*** (based on 4 lb /gal formulation): Apply in the dough or hard-dough stage depending on formulation. Do not use unless possible injury is acceptable. Do not graze treated fields with dairy animals or meat animals being finished for slaughter within 2 weeks after application. Do not feed treated straw to livestock. When using 2,4-D ester formulations, delay planting double cropped soybeans 7 days for rates up to 0.5 lb ai/A and 30 days for rates between 0.5 lb ai/A to 1.0 ai/A. Follow the label for specific restrictions.

A Southern Tier Wheat Field Day will be held Thursday, May 15, 1997 at the farm of Donnie and Duane Moore in Christian County. University of Kentucky specialists will talk about wheat varieties, seeding rates, nitrogen rates, seed treatments and herbicides. Farmers will tour research plots, as well as management systems plots which will include various pest control rates, economics of different management systems, and information on harvesting and storage of wheat.

Registration for the Field Day begins at 8:30 AM (CST) with tours beginning at 9:00 AM. Lunch will be provided by the Kentucky Small Grain Growers Association. For more information, contact Dottie Call.

If you would like to <u>continue</u> to receive this Wheat Newsletter, please complete the following information and return the lower half to Dottie Call at the address listed below.

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