UK COOPERATIVE EXTENSION SERVICE
University of Kentucky – College of Agriculture

LEXINGTON, KY 40546

# Wheat Science News

Research & Education Center, Princeton, KY 42445 October 10, 2013 Volume 17, Issue 2

## *In This Issue:*



## MANAGING VOLUNTEER CORN IN ORDER TO BREAK THE GREEN BRIDGE IN WHEAT

***James R. Martin—Extension Professor of Wheat Science***

Volunteer corn is beginning to surface in a number of corn fields that were recently harvested. The concern over volunteer corn competition to wheat is not as great as it was last season due to the delay in harvesting this year's corn crop. The amount of time for plants to emerge and grow is considerably less this season compared with last year.

Nevertheless, the need to control volunteer corn may still exist in order to mitigate the "green bridge" effect for insects between live corn plants and upcoming wheat crop.

The time for planting wheat is near; therefore, it is important to achieve rapid control of volunteer plants. Tillage provides immediate results, but may increase the risk of soil erosion and require more time relative to using burndown herbicides. While tillage will destroy emerged volunteer corn plants, it could also stimulate germination of any remaining seeds that were incorporated in the soil during the tillage process.

Paraquat provides rapid control of vegetation; consequently, it may be preferred over glyphosate or Finesse, which are considerably slower. There is concern that paraquat alone may be inconsistent. This is often the case when trying to kill corn for replant situations in the spring where the growing points of plants are below ground. Data from three trials indicated Gramoxone at 2 pt/A applied as a burndown prior to wheat planting provided 93 to 100% control of volunteer corn. Our current theory is that the growing points of volunteer corn plants originated from seed on or near the soil surface after corn harvest and were exposed to paraquat and other related stresses.

***Figure 2. Growing point is above soil surface.***

## ALS– RESISTANT COMMON CHICKWEED IN WHEAT?

***James R. Martin—Extension Professor of Wheat Science***

Earlier this spring, consultants with Wheat Tech reported finding common chickweed in several fields in Logan, Simpson, and Warren Counties that was not controlled with ALS inhibitors such as Harmony Extra or Finesse. ALS stands for Acetolactate Synthase which is an enzyme system that helps make certain amino acids in plants. The following photo is an example where an ALS-inhibitor herbicide failed to control common chickweed in Kentucky this past season.

***Figure 1. Common chickweed escaped control following an application of an ALS-Inhibitor herbicide.***

In 2008, ALS-resistant common chickweed was discovered in wheat in Virginia and is now believed to be in Delaware, Maryland, North Carolina, and Pennsylvania.

The potential impact of this resistance could be significant to Kentucky wheat growers. ALS-inhibitor herbicides play an important role in managing chickweed, henbit, and wild garlic in wheat in Kentucky. Harmony and Harmony Extra (and several generics of these) are applied on about 75% of the wheat acres in Kentucky.

Since common chickweed is fairly competitive, it is desirable to control plants when they are small. The majority of common chickweed emerges in the fall; therefore, fall applications tend to be preferred over spring applications for controlling this weed in wheat. The activity of ALS inhibitors tends to be slow, particularly during periods of cool temperatures. Consequently, it may be several weeks after fall applications before you know if the treatments were a success or a failure.

ALS-inhibitor herbicides tend to be prone to developing resistant weeds. The fact Kentucky growers have avoided ALS-resistant common chickweed in wheat for more than 25 years of widespread use of Harmony and similar herbicides, is no accident. Our rotation system of three crops over a two year period (i.e. Wheat / Double-Crop Soybean / Corn) has limited the development of ALS-resistant common chickweed. Applying burndown applications of glyphosate, paraquat, or atrazine prior to corn planting early in the spring can limit production of common chickweed seed, if applications are applied before plants produce viable seed. Keep in mind, ALS-inhibitor products used in burndown applications in corn such as Basis, Basis Blend, Resolve Q, Leadoff, or Crusher may not control populations of common chickweed that are resistant to this chemistry.

The Kentucky Small Grain Growers Association recently funded a project to confirm this resistance and to evaluate alternative herbicide programs. A number of herbicides will be evaluated, including metribuzin, dicamba, Starane, and preplant applications of Valor. We plan to evaluate various combinations and timing of these and other products to help determine the best options to help manage ALS-resistant populations.

---

## INSECT CONSIDERATIONS FOR WHEAT PLANTING DECISIONS

***Doug Johnson—Extension Entomologist***

As I travel around the countryside, I see plenty of emerging corn in fields that will likely be planted in wheat. This “Green Bridge” could lead to problems with certain insects important to wheat Production.
The insect pests we need to consider have not changed from previous years, but their relative importance may have changed from last year. Fall armyworm (FAW), Hessian Fly (HF), cereal aphid complex (CAC), and wheat curl mite (WCM) are annual threats. In most years, only the CAC is of major concern. In 2012 the FAW was a considerable problem in west Kentucky, not only in wheat, but also in many forage grasses.

**Fall armyworm** As you can see from Figure 1 below, there is a great difference in the numbers of FAW captured this year compared to 2012. This pest, which does not overwinter in KY, must migrate from south Texas annually to reach our state. In 2012, moth capture data showed the earliest and largest influx of FAW in recent years (see black line). The result was infestations in wheat, pasture/hay fields and movement into late developing soybean fields. Fortunately, in 2013 FAW does not appear to be of any concern (see green line).

(**Chart is on Next Page)**

***Figure 1. 2013 Capture of Fall armyworm moths in UK-IPM pheromone baited traps at Princeton, KY.***

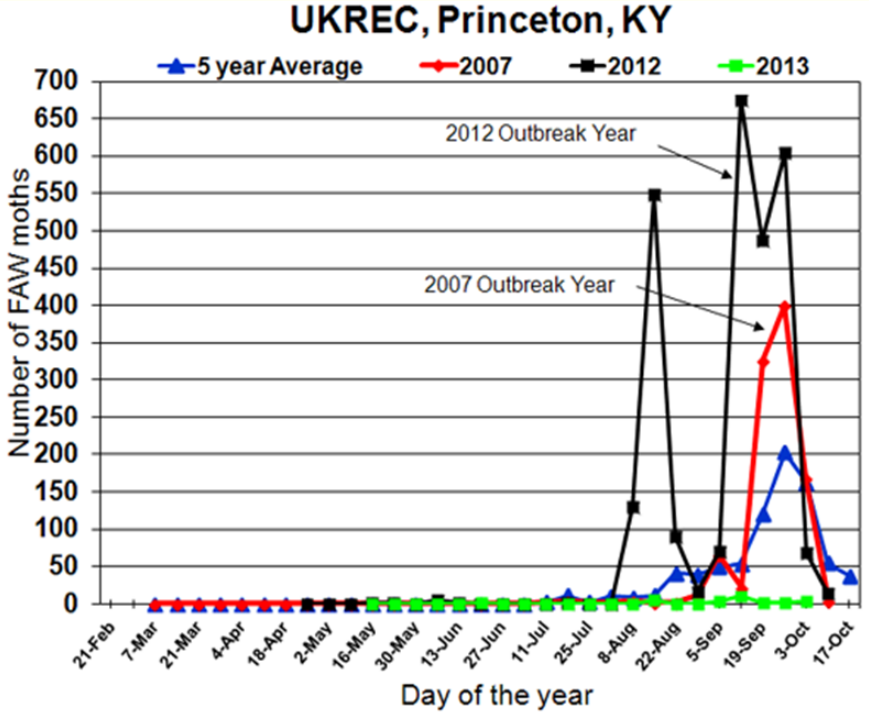


**Figure 2. Adult Hessian Fly on a Wheat Leaf**

Hessian Fly is an annual pest, but for the most part, does not do a great deal of damage in Kentucky's wheat production system. As far as I know, there is no reason to think that the 2013 season will be different. Planting after the Hessian Fly Free date is the single most important management tool. The best controls for HF are preventative. Systemic seed-applied insecticides may be used at planting, but the seed treatment rates used in KY for control of cereal aphids will not control Hessian fly; therefore, a greater rate must be used. Timing of rescue treatments (foliar insecticides) is exceedingly difficult, requiring significant scouting to detect the insect eggs (which are very tiny) laid end to end in long rows aligned with the wheat leaf veins. Once the eggs hatch and the maggots move underneath the leaf sheath, foliar applications are ineffective.

**Figure 3. Corn Leaf Aphids on Wheat Head**

The Cereal Aphid Complex is composed of four main species in Kentucky: the corn leaf aphid, bird cherry-oat aphid, rice root aphid and English grain aphid. These aphids are important due to their ability to vector the viruses that cause Barley Yellow Dwarf disease in small grains. Of these four species, corn leaf and bird cherry-oat aphid are most important in the fall; and their population growth will be greatly aided by a "Green Bridge". Planting after the Hessian Fly free date is of significant help (providing there is no Green Bridge). In addition, seed-applied systemic insecticides and foliar insecticides applied at 30 days after planting have shown to be effective.

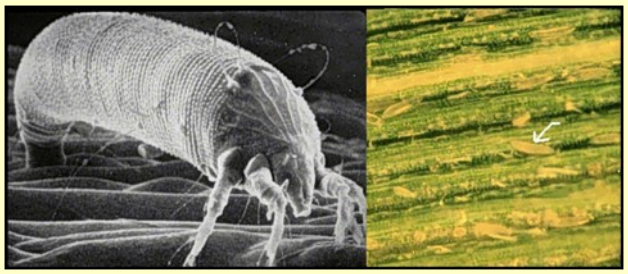

**Figure 4. Electron micrograph of (L) Adult Wheat Curl Mite and (R) Wheat Curl Mite eggs laid on Wheat Leaf.**

The Wheat Curl Mite is occasionally important in KY wheat because it is the vector for wheat streak mosaic virus. This mite can survive on grasses other than wheat, one of which is corn. So, this pest is abundant in the environment at least until corn harvest. If no host plant is available (usually volunteer wheat or corn) between corn harvest and wheat emergence, we do not have a problem. However, if a "Green Bridge" is present then the mites can move from corn to wheat bringing the virus with them (corn is an asymptomatic host of the mite and the virus). It is vitally important to destroy any "green bridge" at least two weeks before wheat emergence.

**Planting Date:** Make no mistake, in reference to arthropod pests, planting date may be the most important decision you make in your wheat crop this year. This is quite simply because all arthropod pests' growth, reproduction, and movement rates are governed by temperature. In addition, the growth rate of wheat is, in-the-main, governed by temperature. Simply stated, on average, the earlier wheat is planted, temperatures will be warmer, and the warm temperatures will last longer than if wheat is planted later. This generally results in more insect/mite infestation, reproduction, feeding and movement of pathogens on earlier as opposed to later planted wheat. In addition, in the case of insect vectored pathogens, (for example, Barley yellow dwarf viruses and wheat streak mosaic virus) early planting will result in more infected plants and earlier infected plants. Earlier infected plants will produce more virus per plant than later infected plants. This is why earlier infected plants are more damaged than later infected plants and why fall infected plants suffer more damage than spring infected plants.

**Green bridge:** Beyond planting date, insuring that there is not a Green Bridge between the previous(if a grass crop) and upcoming wheat crops, is the second most important arthropod management strategy. In Kentucky, with our three crops in two years system, we have crop rotation as a built-in control process because it does not allow wheat in the same field over multiple years. Nevertheless, our common practice of planting wheat following corn (both being grasses), and because our current wheat fields are never very far from last year's wheat fields, a Green Bridge can easily occur. While the wheat curl mite and wheat streak mosaic virus do not harm corn, this corn can serve as an "over summering" place for both pests. If volunteer wheat/corn or grass is allowed to remain alive from before the corn matures until after the wheat emergence, the wheat curl mite has a "Green Bridge" from one wheat crop to another, thus allowing the mite to vector wheat streak mosaic virus into our current crop at a greater rate.

This same idea can also increase Barley yellow dwarf problems by allowing cereal aphids access to hosts (which may also be virus sources) between the corn and wheat crops. However, because these aphids have a much broader host range and a better ability to move and locate wheat fields, preventing a green bridge will aid but not prevent aphid and virus movement.

**Fall Weather:** Short term weather is certainly an important factor in insect damage and vector management. Unfortunately, we have no ability to control the weather. On the other hand, one should understand how this fall's weather will affect our insect management plans. Planting and control decisions should be viewed in consideration of what the short term (Oct-Dec) weather outlook indicates.

**Insecticide Considerations:**

Pre/at-plant soil applied systemic insecticides - There are no longer any products available with these properties.

Seed applied systemic insecticides - These products could provide aid against the cereal aphid complex and Hessian fly. Rates generally used for control of cereal aphids will not control Hessian fly; higher rates would be required. These products are not likely to provide control of fall armyworm or wheat curl mite.

Foliar applied insecticides - There are several products available that can provide control of the fall armyworm and the cereal aphid complex. Although these insecticides would kill Hessian fly adults and freshly hatched larvae BEFORE they get under the leaf sheath (not larvae already protected) it is very difficult to appropriately time an application.

**Insect Management Recommendations:**

Plant after the Hessian Fly free date – even if you eventually need an insecticide treatment, you are likely to have better results because the pest load will on average be lower.

Scout your crop regularly - for the presence of fall armyworm and cereal aphids. Thresholds for control of cereal aphids are:

**Table 1. Action Threshold* for Control of Any Species of Cereal Aphids in Winter Wheat in KY.**

| Crop Age | Aphids / foot of row |
|---|---|
| Emergence to 30 days post plant | 3 |
| 31 to 60 days post plant | 6 |
| (fall) more than 60 days post plant | 10 |

*based on planting during recommended planting times.

FAW threshold is not well established on wheat in Kentucky. Our working number is 4 worms per square foot. If that number is met or exceeded, one should strongly consider a treatment. Insecticide seed treatments are unlikely to control this pest. If severe damage has already occurred, be VERY careful about replanting. If the plants have not been killed, you could end up with a double stand next spring. This will lead to lodging and problems with spring insect pests among other things.

WCM can only be effectively & economically controlled by prevention, so scouting is not needed. Use preventive controls in high risk areas where wheat was allowed to grow as a weed or where wheat will emerge before adjacent corn dries down. Destruction of volunteer wheat and the maintenance of a two-week volunteer-free period prior to planting winter wheat in the fall are the most effective management practices for this mite and the disease that it vectors. No insecticide preventative or rescue treatments are available.

"Insecticide recommendations may be found in ENT-47 on line at:
http://pest.ca.uky.edu/EXT/Recs/welcomerecs.html or from your County Extension Office."