Corn & Soybean News

August 2022
Volume 4, Issue 7

COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT
Grain and Forage Center of Excellence

University of Kentucky

Late Season Weed Escapes

Herbicide applications on full season soybean have been wrapped up on most acres for several weeks now, and double crop applications will be wrapping up soon. Despite most herbicide application being concluded, there are scattered fields with weeds such as waterhemp and Palmer amaranth poking through the soybean canopy. Unfortunately, even with the most robust herbicide program a few escapes can occur, especially around field edges, planting skips, wheel tracks, and spots with underdeveloped soybean canopy. The questions that often occur is how to control these late escapes and what efforts are worth the cost to control these escapes.

What can I spray on escapes?

There is often the temptation to spray late season escapes in soybean, especially if escapes occur at high densities. Although, the majority of postemergence soybean herbicides are not labeled for application either during or past the reproductive stages. Those without a reproductive stage restriction often have a restriction based on timing to harvest, most of which are labeled to be applied no later than 45 to 70 days prior to harvest. We have already surpassed that date or are quickly approaching that time in most soybean fields. So, to answer the question, in most cases we unfortunately do not have products labeled for applications of herbicides this late in the season in soybean. A few selected herbicide products that we often receive questions about for late season escapes are listed in Table 1 along with the growth stage or pre-harvest applications restriction. A complete list of soybean herbicide application timings can be found on page 100 of the 2022 Weed Control Guide for Kentucky Grain Crops (AGR-6).

TABLE 1. Selected list of postemergence herbicides and the labeled growth stage or date restriction for application in soybean. A complete list can be found in the 2022 Weed control Guide for Kentucky Grain Crops (AGR-6) on page 100.

Herbicide	Soybean Growth Stage or Pre-harvest Restriction
Cobra	Do not apply within 45 days before harvest or after R6 (full seed)
Enlist Duo and Enlist One	Can apply up to R2 (full flowering)
Flexstar and Flexstar GT	Do not apply within 45 days of harvest
Glyphosate	Can apply through flowering
Liberty	Can apply up to but NOT including bloom stage and 70 days before harvest
Phoenix	Do not apply within 45 days before harvest or after R6 (full seed)
Ultra Blazer	Do not apply within 50 days before harvest

Outside of fact that most herbicide are not labeled to be applied this late in the season, the size of the weed escapes is the other limiting factor. If you are seeing escapes in soybean at this time of year, these plants are much too large to effectively control with postemergence herbicides. At best you may stunt or suppress the escapes, but these plants are very likely to survive applications and potentially produce seed, if they have not already begun seed production. Additionally, within the list of herbicides in Table 1 that you may still be able to be apply, many are PPO-inhibiting herbicides (i.e. Cobra, Flexstar, Ultra Blazer, Phoenix). While it may be tempting to try to apply one of these herbicides to control late escapes of Palmer amaranth and waterhemp, it must be noted that many of our pigweed populations are also resistant to the PPO-herbicides. Even if you do have a PPO-susceptible population of Palmer amaranth or waterhemp, the plants are too large or mature at this time in the

season to be controlled by these herbicides. These PPO-inhibiting herbicides are only effective on small pigweeds. Furthermore, some late season applications of PPO type herbicides such as Cobra and Phoenix can cause severe leaf burn which could slow soybean growth and development as it recovers.

So what can be done on late season escapes of waterhemp and Palmer amaranth?

A primary goal for management of these two troublesome weeds is to reduce or eliminate new seed production within infested fields. While this does not eliminate the current seed bank or keep seed from moving into the field in the future, it is a large step in reducing the build of an unmanageable seed bank.

If only a few escapes are occurring within scattered spots of the field or along the field edges, a few hours of mechanically pulling plants and removing them from the field can go a long way. If you choose to pull plants, you must remove the plants from the field as both waterhemp and Palmer plants can re-root when simply laid back on the ground. Removal of even a couple of plants from a field can go a long way considering a single plant can produce up to half a million seeds. This applies to plants that are growing just adjacent to your field as well, as these plants are also likely to contribute to the seed bank within the field. The cooler temperatures that are forecast and ample soil moisture in most of the state over the coming weeks will make for easier pulling of these plants.

In some cases, though, the number of escapes is too great to justify the labor to pull all the plants. In these cases, your options really are limited. If the escapes happen to be a few dense pockets across the field (too many weeds overall to hand pull, but only exist in a couple of areas or clumps within the field), you may be wise to simple harvest around those pockets in the fall and sacrifice the soybean crop within those areas. Combines are a great source for spreading waterhemp and Palmer seed. Any time you harvest through a patch of waterhemp or Palmer plants all of the biomass including seed is widely dispersed out the back end of the combine with the chaff, and is likely to be transported to other fields. Harvesting around those pockets does not prevent the waterhemp and Palmer seed from entering the seed bank, but it does help keep the weed seed localized to that spot; whereas, a combine would spread that seed over the remainder of the field and onto others. If you choose the option of harvesting around these pockets, make sure to note the locations for the coming years to possibly implement a more aggressive weed management program in those areas specifically.

Dr. Travis Legleiter
Assistant Extension Professor -
Weed Science
(859) 562-1323
travis.legleiter@uky.edu
@TravisLegleiter

Jonathan Green, Ph.D.
Extension Professor -
Weed Science
(859) 257-4898
jdgreen@uky.edu

Feeding of Japanese Beetles on Soybean also Cause Injuries to Blooms

Japanese beetles, *Popillia japonica* (Coleoptera: Scarabaeidae) are native to Asia. This species was first detected in the early 1900s in New Jersey, but now occurs throughout many areas of the United States. This is a well-established pest in Kentucky.

Japanese beetles have only one generation per year. Its larval stage lives underground feeding on roots, with adults emerging in early-July through mid-September. The larval form of this carabid is called white grub.

Adult beetles are considered destructive pests of many ornamentals, turf, and landscape plants. In soybean fields, it has been observed feeding on leaf tissue between leaf veins; in many cases this feeding leaves a lace-like, skeletonized appearance. Figures 1A and 1B show initial feeding and advanced skeletonized leaf, respectively. Leaf damage in soybeans can appear severe as leaves can be completely skeletonized, and many beetles may be found aggregating on plants in a patchy distribution of the field. However, this injury seldom requires control measures.

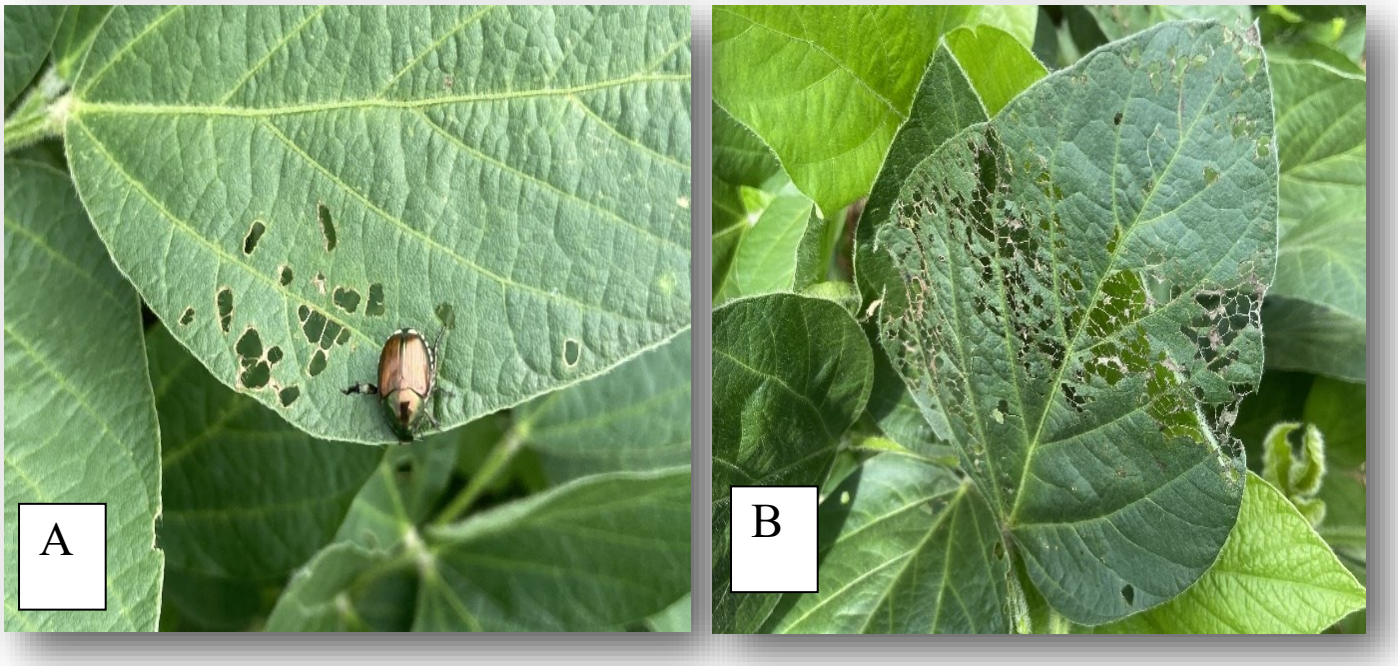

Figure 1. A. *Japanese beetle feeding on soybean leaf, and* ***B.*** *a skeletonized leaf caused by Japanese beetle feeding(Photo: Raul Villanueva, UK)*

At this time, I am reporting a not as well-known feeding habit of Japanese beetles in soybeans. I had heard that this insect was causing some damage to soybean blooms in the North Central region of the U.S. While conducting tallies for insects in soybeans, I observed that a couple of beetles were aggregated under the foliage, and they were feeding on the blooms (Figure 2). Injury to soybean blooms may reduce pod development; however, studies to evaluate the impact of this feeding behavior have not yet been conducted. Feeding on flowers or fruit by Japanese beetles is typical for fruits or ornamental plants.

Figure 2. Although image is not clear, this photo shows Japanese beetles consuming soybean petals. Additional films were captured while this behavior took place (Photo: Raul Villanueva, UK)

Dr. Raul Villanueva
Extension Entomologist
(859) 562-1335
raul.villanueva@uky.edu

SOME EARLY THOUGHTS ON THIS FALL'S SOIL FERTILITY MANAGEMENT

SOIL TESTING for the next crop is important this fall. The summer season's drought, after spring wetness (with compaction issues), is causing lower, more variable, corn and soybean yields. Lower grain yield means lower nutrient removal, but this is not perfectly predictable from a yield monitor. Drought affected grain is usually nutrient rich compared to rainy season grain. More corn acres will be harvested for silage rather than grain and nutrient removal is greater with silage. Soil test 'problem' fields/areas identified earlier this season. If you don't do your own soil sampling, you might want to book sampling services early – this year there are more questions that need samples to inform decision-making.

SOIL ACIDITY hurts root activity – a bigger problem in droughty seasons. Once soil test results are in, take a close look at soil pH. If needed, and if weather permits, lime should always be applied in the fall. Good quality lime takes time to dissolve and cause the carbonates to neutralize soil acidity.

DECIDING WHETHER TO APPLY fall nutrients, especially for corn and soybean, is more difficult this year. The decision generally depends on the target crop (wheat/forages vs. corn/soy); economics/value of fertilizer, time, and equipment; and the soil test value (low values mean higher recommended rates – better nutrient use efficiency when needy soils are fertilized to better match crop demand = spring for summer crops like corn and soybean). Fertilizer prices are lower (except for potash) now, but still high relative to prior years.

WHEAT follows corn in many areas. This year, most wheat will not need fall nitrogen (N). Lower corn yield causes less N removal. Tissue N will be higher in corn residues, giving greater N availability as residues decompose. Many grain producers have fields in forage production. Likely under fertilized this year, these crops/fields may really need some fall fertility to improve stand health, winterhardiness, and both forage quality and stand competitiveness with weeds next spring.

A WINTER COVER CROP can contribute. In addition to protecting against soil erosion (especially with less full-season soy residues this year), cover crops cause greater nutrient retention against fall-winter losses. One ton of rye dry matter (good stand, 12 to 18 inches tall) contains about 35 lb N, 45 lb K_2O, and 10 lb P_2O_5. These nutrients won't all be immediately available with rye termination next spring, but \$32(N) + \$33(K_2O) + \$7(P_2O_5) = \$72 worth of nutrients, considering the most recent average retail fertilizer price levels (https://www.dtnpf.com/agriculture/web/ag/crops/article/2022/08/02/summer-slump-retail-fertilizer), are retained.

FALL NUTRIENT SOURCE DECISIONS might also be difficult. This fall, the need for fertilizer N will be significantly lower. Fall application of N, regardless the nutrient source, will be less economical and losses are more likely, given likely greater fall background soil N levels. Nutrient sources containing N and other important nutrients (DAP, 18-46-0; MAP, 11-52-0; poultry litter) are usually priced considering their N content, making them less desirable for fall application to wheat, corn, and soy acres this fall. DAP, 18-46-0, is a popular fertilizer P source and the most recent DTN survey average retail price

(the URL just above) was $1005/ton. Urea, 46-0-0, was $836/ton ($0.909/lb N). This means that the 360 lb N in one ton of DAP was worth about $327, and the phosphate value was $678/ton DAP ($0.737/lb P_2O_5). About a third of the price of DAP is in the value of N it contains – N that is less likely to be needed this fall. You might ask your fertilizer retailer to bring in triple super phosphate (0-46-0) so that you can meet your fall phosphate needs without losing money on unnecessary N.

FERTILIZER PLACEMENT (banding) improves fertilizer P and K use efficiency, relative to broadcast fertilizer. AGR 1 (http://www2.ca.uky.edu/agcomm/pubs/agr/agr1/agr1.pdf) indicates that in spring, if soil test P and/or K are very low or low, one-third to one-half the recommended rates of P_2O_5 and/or K_2O for corn can be used if it is banded 2 to 4 inches from the row. Relevant research for Kentucky soils is not available, but I'd estimate that precision (GPS guided) banding fall applied P and K would similarly improve their use efficiency relative to fall broadcast P and K. Precision fall banding would likely be superior to spring broadcasting, though not as good as spring banding, as long as corn is planted 2 to 4 inches from the banded P and K. Precision fall placement anticipates precision spring planting.

Dr. John Grove
Professor of Agronomy/
Soils Research and Extension
(859) 562-1301
jgrove@uky.edu

Kentucky Agriculture Training School Survey

The Kentucky Agriculture Training School is planning programs and trainings for the next year and we could use your help! We are interested in meeting the needs of the KY's agriculture community so please take this short survey and provide us with your thoughts. Thanks in advance for your participation. We greatly value your input.

https://forms.gle/Dou6gYh5K8G9niVY7

KATS
Kentucky Agriculture Training School

Occurrence of Fall Armyworms: 2021 vs. 2022

The larval stage of the fall armyworm (FAW), *Spodoptera frugiperda* (Lepidoptera: Noctuidae) is a voracious defoliator of many plant species. The FAW is a native pest of the New World; however, it overwinters in south Florida or in the southernmost region of Texas (The Rio Grande Valley) in the continental USA. The adults are strong fliers and move northward during the summer months. Outbreaks happening some occasions, affecting corn, forages, or double-crop soybeans. In soybeans, fall armyworms can be devastating defoliators affecting plants from the seedling to V4 stages.

Impact in 2021

One common consideration in 2022 for entomologists and Extension specialists is to hypothesize about the presence of the fall armyworm for this growing season. In 2021, this pest caused an outbreak in many areas of the U.S.--from states around the Gulf of Mexico to Kentucky, many northern states, and Ontario and Quebec in Canada. In many areas, FAW caused devastating consequences for grasses, forages, and double crop soybeans. Dr. C. Teutsch (UK Forage Extension Specialist) found that in 2021 the economic impact of this pest to hay and pasture crops in Kentucky exceeded $5 million.

There are two strains of FAW, the rice and corn strains. In 2021, the rice strain (prefers to feed on rice, grasses, and forages) was the strain that caused the outbreak. In addition, for unknown reasons, this strain appeared earlier than in previous years; and moths were continuously migrating until late October and November. The rice strain 2021 might have been resistant to pyrethroid insecticides, as pesticides used to control them were not effective.

Impact in 2022

In late June 2022, FAW detection on Lubbock, TX by a Texas A&M specialist found the highest FAW numbers in 12 years of trapping. Although this is alarming, this location is in the northwestern region of Texas and FAW migrant moths may take a different path. Furthermore, in contacts with Extension specialists from the southernmost area of Texas, the Rio Grande Valley, informed me that by the end of July, FAW has not been a problem this year. This is an area where FAW overwinters and some FAW moth populations migrate from Mexico to colonize the continental U.S.

This year, trapping of FAW in Lexington and Princeton in KY has not been high, and in most cases, captures have not been detected. For example, during the last week of July, there were no FAW trappings in either location. However, be aware that a single FAW female can lay over 2000 eggs and populations can increase rapidly.

Here we are reporting the presence of FAW in a field of forage sorghum in Caldwell County. Larvae captured in this field were in different stages of development, from 1/3 inch to more than 1 inch in length feeding in the whorl (Figure 1). The percentage of damage observed along 5-foot samples ranged from 12% to 56%. Fall armyworm larvae were found feeding deep in the whorl, frass was visible from the outside (Figure 1), and characteristic feeding (irregular-shaped holes similar to grasshopper damage) was present on leaves (Figure 2).

Figure 1. FAW larva feeding on sorghum whorl (Photo: C.D. Teutsch, UK).

Figure 2. Characteristic FAW feeding on leaves, irregular-shaped holes (Photo: Armando Falcon, UK).

The FAW appetite increases while larvae move from the first to sixth instar, and the defoliating damage is greatly noticed by farmers and scouting agents after the fourth instar. The six larval instars can be completed in 14 to 30 days, depending on the temperature.

Fall armyworm resembles corn earworm and armyworm; however, fall armyworm has a white inverted "Y" mark on the front of the dark head (Figure 2). Pupation occurs in the ground and adults can live up to 20 days.

Figure 3. A distinctive, light-colored inverted "Y" mark is present on the head capsule of fall armyworms. Also, pay attention to coloration changes of FAW larvae .
(Photo: Raul Villanueva, UK)

Dr. Raul Villanueva
Extension Entomologist
(859) 562-1335
raul.villanueva@uky.edu

Dr. Armando Falcon-Brindis
Research Analyst
(270) 365-7541
armando.falcon.brindis@uky.edu

Dr. Chris Teutsch
Extension Forage Specialist
(859) 562-1334
chris.teutsch@uky.edu

UPCOMING EVENTS

Jan 5, 2023	**UK Winter Wheat Meeting**
Jan 19, 2023	**KY Commodity Conference - Bowling Green**
March 9-11, 2023	**National Commodity Classic - Orlando FL**
May 09, 2023	**UK Wheat Field Day**
Jul 25, 2023	**UK Corn, Soybean and Tobacco Field Day**

Cooperative Extension Service
Agriculture and Natural Resources
Family and Consumer Sciences
4-H Youth Development
Community and Economic Development

LEXINGTON, KY 40546