



By Larry Reichenberger

Heading off the Hessian fly

Researchers gather new information on this old pest

One of the basic laws of wheat production is to not plant before the “fly-free” date. That old axiom has served to keep the Hessian fly at bay for generations. But now, scientists see a growing number of indications that wheat’s most threatening insect pest may no longer be playing by these old rules.

Delaying planting until after the fly-free date is a cultural practice that takes advantage of the life cycle of the Hessian fly. In the fall, adult flies (which may live only two to three days) emerge from old wheat stubble and the females look for a place to lay eggs. In the past, wheat planted after the fly-free date was typically not a suitable host, so the cycle was broken.

“This approach has worked well, but widespread adoption of no-till wheat production (which creates ideal Hessian fly habitat) has increased insect pressure,” says Jeff Whitworth, entomologist at Kansas State University. “This has led us to take a look at

current recommended fly-free dates. These dates are based on research that is more than 70 years old and we’re finding some potential problems.”

Flies out later. Whitworth explains that in Kansas, fly-free dates are based on field studies done from 1918 to 1935. In 2006 and 2007, he worked with Sedgwick County, Kan., Extension agent Gary Cramer to come up with some updated observations.

“We placed sticky-paper traps loaded with an experimental pheromone lure in unplanted fields of volunteer wheat and wheat stubble from the prior crop,” Whitworth explains. “Insect counts were made at regular intervals from late September until the activity of adult Hessian flies ceased.”

►**Above:** Adult Hessian flies, which look similar to a mosquito, have a life span of only a few days, but females can lay up to 300 eggs. ►**Right:** Jeff Whitworth (left) and Gary Cramer count adult Hessian flies caught on “sticky-paper” traps that were set in fields of volunteer wheat.

PHOTO: USDA-ARS



The chart (shown below) outlines Hessian fly activity the researchers found during the 2007 planting season. “The established fly-free date in Sedgwick County is Oct. 10,” Cramer says. “On that date, we caught an average of five adult flies per trap (spaced 33 feet apart), which was down from an average of seven the day before. However, after dropping to zero,” he continues, “the average number of flies caught increased to 21 on Oct. 21 and to that level again on Nov. 10.”

Hessian fly activity followed a similar pattern in 2006, though numbers were much higher. On the Oct. 10 fly-free date, the number trapped was near zero. However, on Oct. 15 an average of 65 flies were caught and activity peaked on Nov. 9 at 240 flies.

“These results indicate that the established fly-free date for Sedgwick County is too early,” says Whitworth. “We’re expanding this study to also evaluate fly-free dates in other areas.”

Warmer weather. Whitworth theorizes that a slight increase in average fall temperatures over the past 30 years may be causing the later Hessian fly activity. “The increased reliance on reduced tillage may also be a contributing factor,” he says.

USDA entomologist Richard Shukle, working at Purdue University, says fly-free dates are still valid for wheat growers in the Corn Belt, but eventu-

ally, that could change. “Most wheat is planted following soybeans, so the planting date is already delayed. However, if global warming continues to result in mild fall temperatures, then Hessian fly activity will likely continue later in the fall,” he says.

Wheat varieties resistant to Hessian fly are available, but they’re widely grown only in the South, where no fly-free dates exist. “There are 32 genes available for resistance, but following the fly-free date has been so successful in recent decades that wheat breeders have concentrated on other traits, so few popular varieties have Hessian fly resistance,” says Shukle.



PHOTO: USDA/ARS

Shukle adds that, even if resistant varieties were widely available, their durability would be another concern. “The Hessian fly is like leaf rust—mutation occurs rapidly, so the durability of resistance (or life of a variety) is only eight to 10 years,” he points out.

Destroy volunteer. If acceptable varieties with Hessian fly resistance aren’t available, and delayed planting no longer delivers consistent results, then there are few tools left for growers to use against the insect. “This makes it more important than ever for growers to destroy volunteer wheat ahead of planting the new crop to break the ‘green bridge’ that Hessian flies use,” says Whitworth.

He adds that, despite his findings, delayed seeding is still a good idea unless wheat is to be grazed. “There are threats in addition to the Hessian fly that are reduced by delayed planting. These include wheat curl mites, grasshoppers, and aphids, which can spread barley yellow dwarf. If you’re planting into wheat stubble where Hessian flies were a problem, then an insecticide seed treatment will provide 21 to 28 days of protection.” ■

►Left: Hessian fly eggs, laid on plant leaves, hatch into maggots which prefer to feed between the leaf sheath and stem. ►Below: Defying the calendar, adult Hessian flies were still active well after the current Oct. 10 fly-free date in Sedgwick County, Kan., according to recent research data.

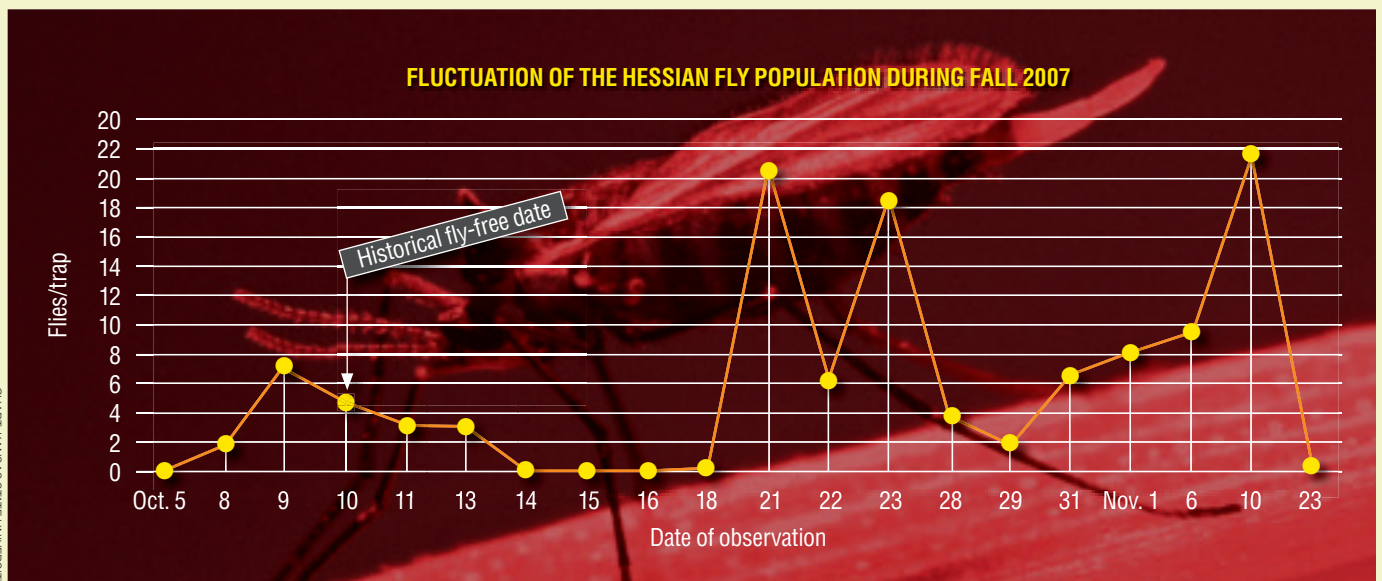


CHART: KANSAS STATE UNIVERSITY