Bees may aid soybean pod set

By **EDITH MUNRO**

SELF-POLLINATING crops like soybeans might seem immune to worldwide concerns about the viability and supply of insect pollinators. However, pollinators can have an effect on bean yields, and soybean growers may have good reason to give more thought to bees.

Key Points

- Even though a self-pollinator, soybeans still could get a yield boost from bees.
- High levels of bee activity could improve soybean pod set.
- Breeders have started selecting varieties based on their insect attractiveness.

The interaction between plants and pollinators is complex, according to bee experts, and involves more than simply moving pollen. Several studies have produced evidence that even self-pollinating crops like cotton and soybeans may yield better when bees work the flowers.

One possibility is high levels of bee activity improve soybean pod set. Older research from a bee lab USDA once maintained in Wisconsin shows higher yields when bees worked the plants in some sites and years, according to Reid Palmer, a USDA Agricultural Research Service geneticist at Iowa State University.

"Soybean plants usually produce many more flowers than develop into pods," he says. "If you can reduce flower drop, you should increase yield. We need to study the role of bees in soybean pollination."

More recently, Palmer has fielded secondhand reports from farmers who saw yields improve in fields adjacent to other crops where bee numbers were high.

Elsewhere, Canadian researchers documented an association between bees and higher yields in food-grade soybeans, and Australian studies have demonstrated that honeybee-pollinated soybeans produced from 10% to 40% more than naturally self-pollinated beans. And in 2005, Brazilian scientists looked at soybean seed production in cages with or without bees and found a 50% increase in yield for cages with bees.

Not all research results are consistent, however. A 2001 study in Louisiana found no evidence that bee foraging improved yields in modern soybean varieties.

Bees and soybean breeding

In a new twist, researchers are looking at using bees in breeding higher-yielding soybeans by taking advantage of the bees' ability to differentiate among soybean varieties based on bee attractiveness.

Concerns over annual honeybee losses have prompted Congress to address ag's need for pollinators in general. The 2008 Farm Bill made it a priority to preserve habitat for the nation's wide number of native bee species, which can supplement or, in some cases, replace honeybees.

That led USDA to establish multiple programs to encourage bee habitat, including matching grants and technical assistance available through the Environmental Quality Incentives Program. Encouraging native pollinators is also a ranking criterion that can mean higher payments per acre for new Conservation Reserve Program contracts, and farmers have established more than 41,000 acres of new pollinator habitat.

The contribution bees can make to grower efforts is less clear for soybean producers than for many of the fruit and vegetable crops, but the combination of government incentives and research possibilities can justify more bee-conscious efforts, especially for growers with CRP land.

On such farms, a modest investment of effort to include native plants and factor bee sensitivities into pesticide application methods are the first steps to consider. Both can potentially improve native bee populations and benefit nearby crops.

In addition to contacting USDA's Natural Resources Conservation Service, growers can find information on several websites, including the Native Pollinators in Agriculture Work Group (*www.agpollinators.org*) and the Xerces Society (*www.xerces.org/pollinator*), where clicking on a map will bring up specific lists of appropriate pollinator-friendly plants by state. USDA publications are also available at *www.nrcs.usda.gov/technical/ecs/database/technotes.html*.

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