

Can bees benefit your beans?

By EDITH MUNRO

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

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 that high levels of bee activity improve soybean pod set. Older research from a bee lab USDA once maintained in Wisconsin showed higher bean yields when bees worked the plants in some locations and some years, according to Reid Palmer, a USDA-Agricultural Research Service research geneticist at Iowa State

University.

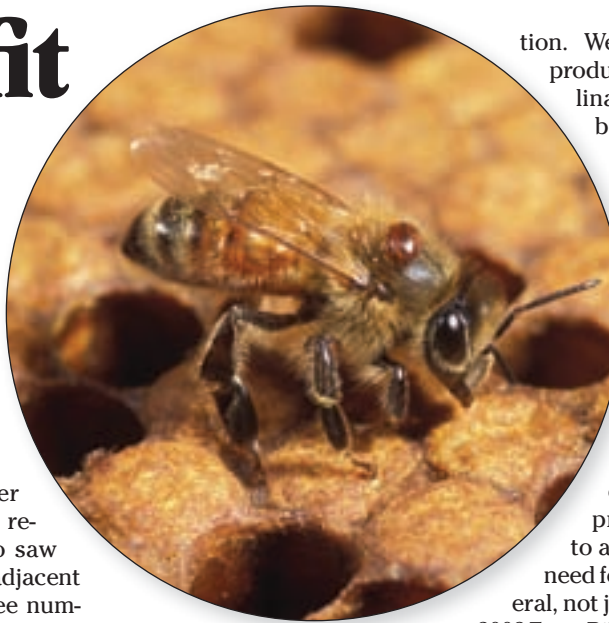
“Soybean plants usually produce many more flowers than develop into pods,” he says. “If you can reduce flower drop, you should increase yield.”

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

Canadian researchers have documented an association between the presence of bees and higher yields in food-grade soybeans, and Australian studies have demonstrated that honeybee-pollinated beans produced 10% to as much as 40% more than naturally self-pollinated beans.

As recently as 2005, Brazilian scientists looked at soybean seed production in cages with or without bees and found a 50% increase in yield for the cages that contained 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, bean breeding

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

“We would use the differences in attraction rates to develop high-yielding and low-yielding breeding lines,” says Palmer. “These lines should provide clues to the soybean traits that contribute to pollinator attrac-

tion. We have been able to produce highly insect-pollinator attractive soybean lines within as little as three years.”

In any case, he emphasizes, “We need to understand much better what’s going on between bees and soybeans.”

In the meantime, concerns over annual honeybee losses have prompted Congress to address agriculture’s need for pollinators in general, not just honeybees. The 2008 Farm Bill, for example, 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 the U.S. Department of Agriculture 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 now 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 to encourage bee populations, according to the Xerces Society.

The contribution bees can make 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 land in CRP.

An 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.

One of the biggest challenges for farmers interested in encouraging native bee habitat has been the shortage of location-specific information.

In addition to contacting the USDA’s Natural Resources Conservation Service, growers can find information online, 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.

Munro writes from Des Moines, Iowa.

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