California Farmer

In the ongoing crisis over honey bee losses and the cost to rent hives, California's position as a leading producer of high-value, bee-dependent crops has the state's farmers looking for answers to their pollinator needs.

Some of those answers may come in the form of native bees, according to researchers.

"Blue orchard bees (*Osmia lignaria*) have potential in several rosaceous orchard crops like apples, cherries, and plums," says Dr. Theresa Pitts-Singer, a research entomologist with USDA's Agricultural Research Service.

"On a small scale, the blue orchard bee does better than a honey bee. The problem on a grand commercial scale is bee retention. We're still working out how many blue orchard bees you need per acre because of the retention problem," she explains.

Dr. Neal Williams, UC-Davis native pollinator specialist, also points to the scale of California agriculture as a complicating factor.

"Many of our crops grow in blocks of 100 acres or more with little pollinator-favoring habitat in the landscape. If bees can't live within the crop itself, they have to come a greater distance from outside the fields. At the same time, big fields mean more flowers that need pollination."

The challenge is especially severe for almonds, which flower very early in the growing season, before many native bees are out or have built significant numbers.

Even so, native bee research is beginning to produce some intriguing possibilities and both Pitts-Singer and Williams see a role for native bees in solving the pollination question.

"That's why the blue orchard bee is so interesting," says Williams. "Its emergence can be modified, and it will fly in poor weather once it is established."

He notes that some smaller scale California farmers already operate successfully without using managed honey bees.

"We are also investigating some interesting synergies between honey bees and native bees," Williams reports. "We don't know the mechanism, but we've found that where there are more native bees present, the value of honey bee visits [to flowers] is increased.

"So if your native bees are more successful, you may need fewer honey bees. The studies are still ongoing, but there's some very encouraging data."

Pitts-Singer also believes natives like the blue orchard bee have potential to benefit California farmers.

"It's an efficient pollinator. It's going to be a player and it's potentially a great insurance policy for some operations," she says. "Even if you could use blue orchard bees to reduce the numbers of honey bees traveling to California, it would help by putting fewer of those bees at risk."

Currently, she oversees research projects designed to answer essential questions about blue orchard bees in almonds, including what chemical signals help the bees decide where to nest and how the pattern for releasing bees influences whether bees are retained in fields.

Meanwhile, supplies of blue orchard bees may begin to improve as suppliers shift from trapping wild bees to mass propagation under tents.

Almonds, which currently require 2 million out of the nation's 2.4 million honey bee colonies for pollination, aren't the only crop that will benefit from ongoing native bee research. From squash and

melons to blueberries, sunflowers, and more, California farmers have a big stake in the success of some little bees.

Meanwhile, the U.S. Congress has also weighed in on bee loss problems. The 2008 farm bill made it a priority to preserve habitat for the nation's native bee species, leading the USDA to establish multiple bee habitat programs, including matching grants and technical assistance available through the Environmental Quality Incentives Program (EQIP).

Encouraging native pollinators is now a ranking criterion that can mean higher payments per acre for new Conservation Reserve Program (CRP) contracts, and farmers have established more than 41,000 acres of new pollinator habitat to encourage bee populations, according to the Xerces Society.

For farmers interested in encouraging native bee habitat, more location-specific information on promoting native bees is becoming available.

In addition to USDA's Natural Resources Conservation Service, growers can find information on several internet sites, including the Native Pollinators in Agriculture Work Group (www.agpollinators.org), the UC-Davis website (http://entomology.ucdavis.edu/news/nativebeepamphlet.pdf) and the Xerces Society (www.xerces.org/Pollinator), where a click on the 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) and the Learning Center offers a free book specifically on blue orchard bees at http://www.sare.org/Learning-Center/Books/How-to-Manage-the-Blue-Orchard-Bee.

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