

## Diet the buzzword for long-term bee health

By Tim Kalinowski

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While most in the public are aware there is a huge concern with long-term bee health and survivability in North America with news stories about varroa mites, fungal infestation and Colony Collapse Disorder reported regularly in the media, Agriculture and Agri-Food Canada scientist Danica Baines suggests people may have become too preoccupied with pointing a finger at neonicotinoids and risk missing the overall picture of bee health, and how it is managed in our food-growing systems.

“What we are interested in doing is finding solutions for the worldwide bee losses,” Baines told an attentive audience at the Farming Smarter Field School just outside of Lethbridge on Wednesday. “And that involves understanding whether the bees require food supplementation at different times of their life-cycle. It also involves means we have to be creative and come with potential solutions to pesticide interactions with the bees in cropping systems.”

Baines said there is no question any applied fungicide or insecticide, including neonicotinoids, are fatal at higher exposure levels to managed bee populations, including honey bees, leafcutter bees and bumble bees, but her research suggests a change in diet and better spray management practices could mitigate those exposure risks dramatically.

Using the example of honey bees, Baines and her research team have discovered susceptibility to pesticides and fungicides is much higher in winter bees, that last colony of the year produced before winter sets in, and prior to the emergence of the new spring pollinators (about the time the dandelions come out).

“Winter bees are a lot more susceptible to pesticides than summer bees, and that is due to changes in structure of their gut,” explained Baines.

Baines and her team have experimented with adding proteins to the bees’ sparse winter sugar water diet, and found excellent improvements in overall bee health and susceptibility to pesticides and fungicides.

“Right now the way bees are managed, you take away their honey at the end of August and then give them sugar water to get them through the winter,” said Baines’ team member beekeeper Nora Chomistek. “That sugar water does not have near the nutrients honey does.”

“The idea is if we can get this (protein additive) technology in the colony at the right time, then you don’t even have to worry about what you do in the field because the bees are protected,” added Baines. “You are giving them what they need to make it through whatever you apply.”

With summer kill, Baines and her team have been experimenting with adding certain prebiotics to the bees’ diets to give them greater resistance to disease, parasites and applied chemicals. The early results have been promising, said Baines.

“We are trying to give it to the bees to see if they can store it in their honey,” she said. “The summer effects we are hoping for is we have a lower pathogen burden within the colony.”

Baines’ team looked particularly at leafcutter bees in this instance to prove the effectiveness of the special prebiotic additive they have come up with.



Agriculture and Agri-Food Canada scientist Danica Baines discusses groundbreaking research her team is doing to improve bee health in agriculture at the Farming Smarter Field School on Wednesday. Herald photo by Tim Kalinowski

“We looked at how we could protect these bees from pesticides in the field,” explained Baines. “We have done it in the lab, and proved we can use that prebiotic additive, and it does protect leafcutter bees from neonicotinoids.”

However, Baines admitted it was likely several years away before their protein and prebiotic additives come to market. In the meantime, she said most farmers who use bees as pollinators understand the natural activity cycles of the insects and refrain from spraying during times of heightened bee activity later in the morning and early afternoon. The bigger challenge is breaking through into the public awareness around this issue, which has been negatively driven by the neonicotinoid debate, she said.

“It’s a communication issue,” she said. “We need to be saying we are not out there spraying helter skelter. We have a reason for doing this. We have a spray management program and this is it. And it is based on the biology of each type of bee.”