

Organic mulch lets insect pollinators do their job

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A squash bee (*Peponapis pruinosa*) visits a pumpkin (*Cucurbita pepo*) blossom in an experimental plot. Credit: Photo by Caitlin Splawski.

As interest in organic agricultural and horticultural practices continues to grow, so does the need to identify alternative weed control practices. Mulching, a common practice used to control weeds and reduce the need for tillage, can also reduce insect pollinators' exposure to harmful

pesticides; however, finding the right mulch materials that allow pollinators to flourish can be challenging. Caitlin E. Splawski, from The Ohio State University Department of Horticulture and Crop Science, researched the effects of several types of organic mulch on squash bees, an important pollinator of squash, pumpkins, and gourds. "Crop pollinators that use agricultural fields for nesting deserve consideration," Splawski said. "Zucchini squash has a high pollination demand, and the native, ground-nesting squash bee (*Peponapis pruinosa*) provides the majority of the crop's pollination requirement in some environments."

Splawski explained that squash bees nest directly in crop fields, and their nests can be disturbed by tillage and other management operations.

"Squash bees are a solitary, ground-nesting species that produce one generation per year. The females make one or more nests per season, usually directly under the squash plants from which they forage."

Splawski said that squash bees are highly sensitive to insecticide applications and tillage because they locate their nests in squash fields and have no noncrop host plants in most of their range. "The use of mulch for weed control could alleviate some incidental risks posed to pollinators by herbicides and tillage, but could also have negative consequences for squash bee populations," she noted. "Mulch applied to the soil surface acts as a physical barrier to weed emergence and could similarly prevent bee nesting."

Splawski and scientists from The Ohio State University designed field and greenhouse studies to compare the effects of nontillage [weed control](#) methods including polyethylene black plastic, woodchips, shredded newspaper, a combination of shredded newspaper plus grass clippings, and bare soil (control) on soil characteristics, squash pollination and fruit production, and squash bee nesting. The study appears in *HortTechnology*. Results showed that mulch type had specific effects on pollinator and crop performance, and suggested that certain types of mulch may be more conducive to squash bee nesting than others. "We

found that squash bee nests were located within bare soil, newspaper, and newspaper-plus-grass plots, indicating that these mulches did not prevent nesting," the researchers said.

Analyses revealed that shredded newspaper combined with grass clippings is an effective mulch material with no apparent negative impacts on squash bee nesting or on squash floral resources and pollination. Splawski noted that the newspaper-plus-grass grass [mulch](#) also improved plant growth and fruit production, "possibly from an addition of plant-available nitrogen, or the presence of preferable nesting ground."

More information: horttech.ashspublications.org/...nt/24/5/527.abstract

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