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## Management Practices for Legume Cover Crops to Optimize Pollinator Health

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Most wild bees live in the ground while some live in tunnels or cavities found in the surrounding environment. Although our understanding of bee nest architecture is still evolving, here is some general guidance aimed at supporting bee health, bee survival, and cash crop pollination services while still achieving soil health benefits of legume cover crops.

- Limit tillage to less than six inches in depth where possible. Shallow tillage, strip tillage, and/or no-till can avoid damage to ground-nesting bees. For example, the solitary squash bee, *Eucera (Peponapis) pruinos*, is a crop pollinator in our area that has nests in the soil. Adult females rest nightly at about two inches below the soil surface during squash bloom. Eggs are laid in chambers, at about six inches below the soil surface. Squash bees are attracted to nesting in disturbed areas, so some shallow tillage may encourage squash bee nesting in heavier soils<sup>1</sup>.
- Allow legumes to reach full bloom before mowing or terminating. Blooms provide nectar and pollen to bees and other pollinators. Even though a legume cover crop may have achieved satisfactory aboveground biomass and nitrogen fixation earlier, allowing it to continue to bloom for a while longer than dictated by agronomic goals can provide important additional floral resources to pollinators.
- Plant legumes that flower at different times of the season, and/or time the mowing of legumes to promote flowering throughout the season. Sowing early-season cover crops like field peas or vetch, as well as cover crops that flower later in the season, like red clover or sweet clovers, so that floral resources are available for longer periods of time. Mowing areas of clover at different times can stagger regrowth and flowering periods.
- Diversify legume selection to support different pollinators. White clover flowers are accessible to many bees, including those with shorter tongues, like the yellow banded bumble bee, *Bombus terricola*. Red clover flowers have long corollas that limit nectar access to longer tongued insects, such as other species of bumble bees, though pollen is accessible to many.
- Use a high mowing height for perennial covers. Set mowers to leave at least 4 inches of vegetation so that some blooms may be left behind to support pollinators, and plants will more rapidly regrow and bloom. If mowing, select covers that are adapted to it. Small to intermediate or medium type Dutch white cultivars, in particular 'Pinnacle', are adapted to mowing. 'Pinnacle' has been shown to flower more in mowed areas (if cut at 4 inches or more in height). Medium type red clover cultivars may be better suited to persist when mowed<sup>2</sup>.

References: 1. Brochu K.K., Fleischer S.J., and Lopez-Uribe M.M. 2021. Biology of the squash bee, *Eucera (Peponapis) pruinos*. Penn State Extension. Retrieved from <https://lopezuribelab.com/squash-bee-biology/> 2. University of Vermont Center for Sustainable Agriculture. Bee Friendly Pasture. By Sid Bosworth. (2015). Retrieved from [https://www.uvm.edu/sites/default/files/The-Center-for-Sustainable-Agriculture/resources/bee\\_friendly\\_pasture.pdf](https://www.uvm.edu/sites/default/files/The-Center-for-Sustainable-Agriculture/resources/bee_friendly_pasture.pdf).



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