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Conference Details

Communication Type: Oral presentation (pollinator symposium) Date: 3/21/2018

Total Expense (USD): 500

Location: Madison, Wisconsin

Conference Title: Annual meeting of the North Central Branch of the Entomological Society of America

Communication Title: Increasing wild bee abundance on spring-flowering crops: the importance of considering phenological overlap when designing habitat enhancements

ABSTRACT

Both wild and managed bee species have undergone population declines in recent years over much of the Western world due. This is predominantly due to changes in agricultural practice, and the most pronounced declines have correspondingly occurred in agricultural areas. This is particularly concerning since around 75% of crop species and 35% of food production is dependent on insect pollination, much of this service being provided by bees. Two spring-flowering crops, highbush blueberry and tart cherry, require insect pollination to achieve maximum yields, and hence declines in bee numbers are likely to impact production. Wild bee populations on farmland can be enlarged by creating flower-rich grassland habitats that provide the pollen and nectar resources bees require to raise their offspring. However, the extent to which this kind of management intervention results in increased number of wild bees on crop flowers is unclear in most cropping systems. In order to investigate this in two contrasting cropping systems, herbaceous floral enhancements were established adjacent to five blueberry fields and five cherry orchards in western Michigan in 2013. The wild bee communities visiting crop flowers and the herbaceous enhancements were quantified over a five-year period between 2013 and 2017 and were compared to those at unenhanced control fields and orchards. The presence of herbaceous floral enhancements did not increase the abundance of wild bees on either blueberry or cherry flowers during bloom. An analysis of the pollens collected by the wild bee community suggests that the majority of pollen collected by both bee communities comes from spring-flowering woody plants. The herbaceous enhancements attracted a significantly greater abundance and species richness of wild bees, including twice as many floral specialists. Conserving summer flying grassland associated bees is a meaningful result from the perspective of bee conservation, but consideration must be given to the use of herbaceous enhancements on farmland if the stated goal is to increase the abundance of wild bees visiting spring-flowering crops.

Application must not exceed two pages and must be submitted as a pdf file to pda@grd.msu.edu
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Applications that do not respect these criteria will not be considered for the MSU PDA travel award.

COMMUNICATION OUTCOMES

I was invited to the North Central Branch meeting of the Entomological Society of America to present work from a five-year project aimed at improving pollination services in Michigan blueberry and tart cherry production systems. I am a newcomer to both this research system in particular and the United States in general, having moved here from the United Kingdom at the start of 2017 to complete the fifth and final year of fieldwork for this project. Broadly, presenting at this conference offered me the opportunity to i) disseminate relevant and topical research about protecting and improving populations of wild bees in agricultural systems ii) increase my profile as a Midwestern wild bee researcher and iii) network with and potentially set up collaboration opportunities with other regional bee researchers.

In addition to their annual meeting for all members, the Entomological Society of America runs branch meetings in different parts of the country each year. The North Central Branch meeting brings together insect researchers from the Midwest, Great Plains and Central Canada. This smaller and more regionally focused meeting provides better and less hectic opportunities to speak with researchers working on similar research systems and ecological questions. As a system based ecologist, networking with researchers from nearby regions allows for more in-depth detailed discussion about individual species-level ecology and increases the likelihood of fruitful collaborations due to increased geographical and hence ecological similarity.

The work I presented builds on much of the current thought on improving wild bee populations in pollinator-dependent cropping systems. In addition, it integrates detailed individual species-level dietary characterization for the most important wild bee species in both blueberry and cherry systems. This analysis is based on morphological identification of pollen grains collected by wild bees in order to identify appropriate plant species to include in future habitat enhancements in order to support larger populations of important crop pollinators. The addition of these data provides novel insights into why different bee groups respond differently to habitat management in agro-ecosystems, and offers suggestions as to future managements strategies. Overall, this work has been written up as a manuscript and is currently under review at Ecological Applications.