Using Novel Soil Microbes as a Neonicotinoid Alternative on Popillia japonica Newman Infestations as a Method of Pollinator Protection

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Neonicotinoids are a family of insecticides that have gained worldwide popularity. By 2009, the global Neonicotinoid market was worth $2.63 billion. Recently, their usage has come under question as studies have shown a correlation between Neonicotinoids and a degradation of behaviors necessary for honeybee survival. This is alarming as one third of total crop production is dependent upon insect pollination. This research is focused on determining if novel soil microbes could be a viable alternative to Neonicotinoids. The effectiveness of Imidacloprid (a type of Neonicotinoid), GrubGone G (commercial microbe) and 2 experimental microbes were tested using the model organism Popillia japonica. 40 beetles were sectioned off for each trial and caged in cylinders, where they then either remained untreated or underwent treatment from the respective product tested. 4 trials were replicated for each product. The number of larvae present in each plot was recorded on September 19th, 2019. The Imidacloprid was the most effective of the products, with a mean of .3 larvae. The first Experimental Microbe was more effective than the second Experimental Microbe in the July 18th trials, but less effective in the August 15th. Overall, the two microbes appear to supply similar levels of control. While not as effective as the Imidiacloprid, the experimental microbes did prove to be effective in reducing the number of larvae present in comparison to the control and GrubGone G. In the future, different ratios of the microbes could be tested for effectiveness.

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