Opportunities for Precision Feed in Apiculture

Authors : John Michael Russo

Abstract : Honeybees are important to our food system and continue to suffer from high rates of colony loss. Precision feed has brought many benefits to livestock cultivation and these should transfer to apiculture. However, apiculture has unique challenges. The objective of this research is to understand how principles of precision agriculture, applied to apiculture and feed specifically, might effectively improve state-of-the-art cultivation. The methodology surveys apicultural practice to build a model for assessment. First, a review of apicultural motivators is made. Feed method is then evaluated. Finally, precision feed methods are examined as accelerants with potential to advance the effectiveness of feed practice. Six important motivators emerge: colony loss, disease, climate change, site variance, operational costs, and competition. Feed practice itself is used to compensate for environmental variables. The research finds that the current state-of-the-art in apiculture feed focuses on critical challenges in the management of feed schedules which satisfy requirements of the bees, preserve potency, optimize environmental variables, and manage costs. Many of the challenges are most acute when feed is used to dispense medication. Technology such as RNA treatments have even more rigorous demands. Precision feed solutions focus on strategies which accommodate specific needs of individual livestock. A major component is data; they integrate precise data with methods that respond to individual needs. There is enormous opportunity for precision feed to improve apiculture through the integration of precision data with policies to translate data into optimized action in the apiary, particularly through automation.

Keywords : precision agriculture, precision feed, apiculture, honeybees
Conference Title : ICPFTA 2023 : International Conference on Precision Farming Technologies and Applications
Conference Location : Tokyo, Japan
Conference Dates : May 22-23, 2023