

3.3 Honey bee collected pollen: forage species importance and levels of neonicotinoid contamination

Mary A. Harris, Reid Palmer, Joel Coats

Iowa State University, 339 Science II, Ames, IA 50011-3221, USA

Abstract

In 2013 studies of floral resources available to honey bees at the time of planting neonicotinoid treated corn seeds were initiated. The basis of these studies was to examine the early season weeds and other flowering plants in and around corn fields from which bees could collect pollen. The objective was to determine best practices for weed management to mitigate exposure of bees to insecticide contamination from planting dust. Pollen traps were used to strip returning foragers of pollen pellets that were sorted by color and identified to genus of parent plant using a reference collection of pollen removed from plants in bloom at the time of pollen collection. Pollen collection was initiated a week prior to initial corn planting and each week thereafter for 6 weeks.

Analysis of pollen for contamination with neonicotinoids revealed no contamination prior to treated seed planting, high levels of contamination (25 - 119 ppb clothianidin; 11-85 ppb thiamethoxam) the first week of planting and declining contamination levels detected the first and second weeks post planting. The majority of bee-collected and neonicotinoid contaminated pollens were from woody plant species. These plants, particularly members of the Rosaceae, do not occur within corn fields or along the margins, but typically occur in farm yards, small woodlots and along water-ways. Weed management practices associated with corn production do not target these species. Furthermore, the elimination of these species from the landscape is not feasible nor in the best interests of honey bees as the 2013 results clearly demonstrate the importance of these woody plant species in provisioning honey bees with early-season pollen. Results to date from 2014 have been presented at the symposium.