

Quantifying Drift of Honey Bees (*Apis mellifera*) to Alfalfa Seed Crop in Central Oregon

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Abstract

Pollinator movement in flowering fields has been an interest in areas where differences in quantity and quality of nectar and pollen sources could potentially cause pollinators to bypass intended crop for one that is more favorable. Two locations were selected for observation of honey bee (*Apis mellifera*) drift between carrot (*Daucus carota*) and alfalfa (*Medicago sativa*) seed crops. Honey bee colonies with paint marked bees were placed in carrot fields and bee visitations to flowers of both carrot and alfalfa seed crops were recorded. On average about 3-7 percent of marked honey bees drifted to alfalfa fields. Preliminary results suggest that the bee movement between carrots and alfalfa were not significant.

Methods and Materials

Two standard 10-frame Langstroth hives with roughly 10,000 bees were used for this preliminary drift estimation study. Approximately ninety percent of the bees in each of these experimental hives were marked with paint on their thorax two days before placement in the fields. These hives were transported from Corvallis and placed next to carrot fields when both carrots and alfalfa seed crops were in bloom.

After three days, bee visitations to flowers in both carrot and alfalfa fields were recorded. The study included two locations that differed in spatial distribution: 1) carrot and alfalfa fields adjacent to each other and 2) carrot and alfalfa fields with an isolation distance (aerial) of approximately one mile. Paint-marked bees that were foraging in both crops were counted by using clickers during a 5 minute transect. We repeated bee visitation counts several times during the short-study period beginning July 17, 2012 and ending July 25, 2012.

In addition to counting painted bees, unmarked bees foraging in these fields were also recorded during the study period. Unmarked bees were recorded to provide additional information in case there was an inadequate number of a marked bee in the respective fields.

Results and Discussion

On average about 7 percent of marked honey bees drifted to alfalfa fields where alfalfa and carrots were in adjacent fields. A drift of about 3 percent was observed between the isolated fields of carrot and alfalfa. Movement of bees was relatively higher when the fields of carrot and alfalfa were located adjacent to each other compared to fields that had isolation distance between them. A relatively higher number of foraging honey bees were found in the middle of the alfalfa fields compared to the edges. Honey bees appear to forage more in the middle of alfalfa fields to avoid competition and frenzy activity from leafcutter bees.

Preliminary results suggest that the bee movement between carrots and alfalfa were not significant. There are many limitations to this study such as sample size and the duration of the study, hence long term and larger studies are recommended if more robust and reliable information is desired.