

Chemical Control/New Products

Determining Re-entry Intervals for Pollinators Following Spinosad Applications

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Keywords: honey bee, *Apis mellifera*, Spinosad, Success, Sevin, carbaryl, almond, citrus, alfalfa

Three studies were conducted to determine the safety of spinosad, the active ingredient in Success* Naturalyte* insect control, to honeybees. Two studies were designed to determine if night applications to tree fruit in bloom could be made without adversely affecting bees. A separate study was conducted to determine the effects of a 3 hour re-entry interval on honeybee mortality and foraging behavior.

Evening Applications

One study was conducted in almonds during bloom in Fresno, CA. Success was applied at night at 6.0 fl.oz./A to almonds during full bloom. Applications began about 6:00 p.m. and finished by 12:00 midnight. Five honeybee hives were placed in the treated and five hives in the untreated blocks of 10 acres each, two days prior to the application. All hives were equipped with Todd dead bee traps. Dead bees were collected in the traps on a daily basis for two days prior to the treatment and for 12 days following the treatment. Bee visitation of treated trees was monitored 12 hours after application. Brood health on all hives used in the study was evaluated 30 days after the application. Mortality of bees in the hives located in the treated blocks was not statistically different than those located in the untreated blocks. Average number of dead bees per day was less than 100 dead bees per hive for the duration of the study.

A second study was conducted in citrus during bloom in Ridge Grove, CA. Success was applied at 9.0 fl.oz./A at night. Applications began approx. 10:00 p.m. and finished by 3:00 a.m. Evaluation of bee mortality was similar to the almond study. No significant difference was noticed in the bee mortality between the treated and untreated blocks. Overall bee mortality was within the normal range. There was no impact on the brood development or bee visitation following the application Success to citrus.

Three Hour Re-Entry Interval

A 45-acre field of blooming alfalfa near White Swan, WA, was used as an indicator crop. Five acres in each of the 4 corners of the field were used as unreplicated treatment plots. The remainder of the field served as a buffer between treatments. Five healthy hives of honeybees were placed in the farthest corner of each of the 5 acre plots and served as replicates. All hives were covered the morning of the applications. Aerial applications were made 09 Aug 99 beginning 9:00 a.m. and finishing by 9:30 a.m. Success (spinosad) was applied at 4 and 10 fl.oz./A, respectively, representing the low and high end of the label rates for tree fruit pests. Sevin (carbaryl) was applied at 1 lb/A as a positive standard. Three hours after applications were made, hives were uncovered and bees allowed to forage. Todd dead bees traps were used to assess mortality. Number of foragers per 15 seconds per sq.m. was used to assess morbidity. Counts of brood and adults per hive were made before and after treatments.

Success at 4 or 10 fl.oz./A had no significant effect on honeybee mortality, foraging, or brood development following a 3 hour drying period. Numbers of brood 10DAA were also not statistically different for any treatment.

Conclusions

These studies showed that Success can be safely applied at night to blooming trees without a significant impact on the pollinating honeybees. A minimum 3 hour drying period is recommended following application.

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Table 1. Effects on honeybee mortality and foraging following 3 hr drying period (n=5).					
	8 Aug	9 Aug	10 Aug	11 Aug	12 Aug
No./Todd Dead Bee Trap					
Success 4 fl.oz./A	22.2 a	19.8 a	61.8 a	22.6 a	21.2 a
Success 10 fl.oz./A	22.4 a	22.4 a	53.8 a	26.8 a	19.6 a
Sevin 1 lb/A	17.6 a	13.0 a	1,233.2 b	689.2 b	37.8 a
Untreated	20.0 a	24.0 a	29.6 a	19.00 a	27.2 a
No. Foragers/15 Sec					
Success 4 fl.oz./A	1.8 a	2.2 a	1.0 a	2.6 a	2.7 a
Success 10 fl.oz./A	1.5 a	1.8 a	1.0 a	2.1 a	2.5 a
Sevin 1 lb/A	1.8 a	2.4 a	0 b	2.1 a	2.2 a
Untreated	2.2 a	2.5 a	1.2 a	2.5 a	2.5 a

Treatments followed by same letter are not significantly different. Tukey's p=0.05.