

#### 4. Chemical Controls/New Products

##### **EFFECTS OF SUCCESS ON HONEY BEE FORAGING & MORTALITY WHEN APPLIED TO BLOOMING APPLES**

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This test was designed to evaluate the effects of applying Success 2SC (DowElanco) on honey bee (*Apis mellifera*) (HB) foraging and mortality when applied to blooming apple (*Malus domestica*).

A 6-acre, 15-year old orchard of Red Chief apples at West Yakima, WA was used for this test. The entire orchard was treated with Success (0.09 lb(AI)/acre) (5.8 oz) at 1900 h on 1 May. The apple trees were at 10% open bloom. There were a few blooming dandelions on the edges of the orchard. Spray applications were done using a tractor drawn air-blast sprayer at a rate of 100 gallons of water per acre.

At 2200 h on 29 April, six strong honey bee colonies were established adjacent to the orchard. On 29 April, Todd Dead Bee Traps were attached to 4 of the colonies (4 replications) when the orchard was at first bloom. The number of dead bees in the Todd traps were recorded prior to 0800 h 1 May (pre-application) and 2, 3 and 4 May (post-application).

The number of honey bees per tree per 30 seconds (10 replications) foraging the trees were recorded at 1100 h on 1, 2, and 3 May.

##### Results:

Weather conditions were good for bee flight.

There were no significant differences in the number of honey bees foraging the apple blooms after the application of Success as compared to the pre-application counts (Table 1).

There were no significant differences in the number dead honey bees in the Todd dead bee traps after the application of Success as compared to the pre-application counts (Table 2).

##### Conclusion:

In our work over the last 35 years we have correlated the number of dead bees and the magnitude of the kill as follows: up to 100 dead bees per day is normal die off; 200 to 400 dead bees per day is a low kill; 500 to 900 per day is a moderate kill; and 1,000 or more per day is a high kill (Johansen and Mayer, 1990).

Success applied in the evening to blooming apples is not hazardous to honey bees.



Table 1. Effects of applying Success to Red Chief apples (10% open bloom) at 1900 h on 1 May on honey bee (HB) foraging on blooming apples. West Yakima, WA. 1997.

| <u>Treatment</u> | <u>lb (AI)/acre</u> | <u>Mean No. HB/30 seconds/tree at 1100 h</u> |              |              |
|------------------|---------------------|--|--------------|--------------|
|                  |                     | <u>1 May*</u>                                | <u>2 May</u> | <u>3 May</u> |
| Success 2SC      | 0.09                | 7.2a   | 8.7a         | 9.1a         |

\* pre-application counts

Means within a line followed by the same letter are not significantly different at the  $P = 0.05$  level, Newman-Keuls studentized range test.

Table 2. Effects of applying Success to Red Chief apples (10% open bloom) at 01900 h on 1 May on honey bee (HB) mortality, based on Todd dead bee traps on colonies placed adjacent to orchard. West Yakima, WA. 1997.

| <u>Treatment</u> | <u>lb (AI)/acre</u> | <u>Mean No dead HB/colony</u> |              |              |              |
|------------------|---------------------|-------------------------------|--------------|--------------|--------------|
|                  |                     | <u>1 May*</u>                 | <u>2 May</u> | <u>3 May</u> | <u>4 May</u> |
| Success 2SC      | 0.09                | 27a                           | 56a          | 45a          | 55a          |

\* pre-application counts

Means within a line followed by the same letter are not significantly different at the  $P = 0.05$  level, Newman-Keuls studentized range test.