

Pome Fruits—Chemical Control

Effects on Honey Bees of Carzol Applied to Blooming Apple Trees

D.F. Mayer, J.D. Lunden and M.R. Jasso
Washington State University IAREC, Prosser, WA

Keywords: honey bee, Carzol, apple

Four tests were done to evaluate the field hazard of Carzol 92% SP (1 lb/acre) to honey bees when applied to blooming apple trees. In all tests, honey bee colonies with Todd dead bee traps attached to monitor adult bee kill were placed adjacent to the orchard. The categories for bee kills are: normal die-off (0 to 100 bees/day), low kill (200 to 400 dead bees/day) and moderate kill (500 to 900 dead bees/day). In 3 tests a few trees were not treated and the number of honeys/tree/minute was recorded on the treated and untreated trees.

In the first test, Carzol was applied to a 4-acre commercial orchard in full bloom at 11 am on 25 April. The application resulted in a low kill of adult bees and the kill lasted for about 3 days:

Table 1. Mean no. dead honey bees/colony/day.

23 Apr	24 Apr	25 Apr	26 Apr	27 Apr	28 Apr	29 Apr
30	22	21	305	200	180	100

In the second test, Carzol was applied to an 8-acre commercial orchard in full bloom at 8 pm on 12 Apr. The application resulted in a low kill of adult bees and the kill lasted for 1 day:

Table 2. Mean no. dead honey bees/colony/day.

12 Apr	13 Apr	14 Apr	15 Apr	16 Apr
28	49	167	4	22

There were significantly fewer honey bees foraging in the treated plot as compared to the untreated check at 1 and 2 days after application:

Table 3. Mean no. honey bees/tree/30 seconds.

Treatment	13 Apr	14 Apr	15 Apr
Carzol	2a	3a	8a
Check	4b	7b	9a

In the third test, Carzol was applied to a 10-acre commercial orchard in full bloom at 8 pm on 16 Apr. The application resulted in a low kill of adult bees and the kill lasted for 1 day:

Table 4. Mean no. dead honey bees/colony/day.

16 Apr	17 Apr	18 Apr	19 Apr	20 Apr
41	26	167	61	39

There were significantly fewer honey bees foraging in the treated plot as compared to the untreated check at 1 day after application:

Table 5. Mean no. honey bees/tree/minute.

Treatment	16 Apr	17 Apr	18 Apr
Carzol	20a	9a	19a
Check	18a	21b	17a

In the fourth test, Carzol + Thiodan was applied to an 8-acre commercial orchard in full bloom at 9 pm on 1 Apr. The application resulted in no abnormal kill of adult bees:

Table 6. Mean no. dead honey bees/colony/day.

31 Mar	1 Apr	2 Apr	3 Apr	4 Apr
14	28	10	32	20

There were significantly fewer honey bees foraging in the treated plot for 1 and 2 days after application:

Table 7. Mean no. dead honey bees/tree/30 seconds.

Treatment	1 Apr	2 Apr	3 Apr	4 Apr
Carzol	4.1a	0.7a	1.6a	9.5a
Check	4.4a	6.7b	5.4b	10.5a

Conclusion

Carzol applied during late evening to blooming apple trees presents minimal hazard to honey bees. However, Carzol should not be applied during the day when bees are foraging. Carzol applied late evening reduces the number of foraging honey bees, though this reduction should have little effect on fruit set.