

Nuts—Chemical Control

Navel Orangeworm in Almond

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The thrust of these trials was to see what effect Orchex 796 oil had on navel orangeworm (NOW) eggs, first in the lab and then in the orchard. Both in the lab and field trials we evaluated Orchex at different rates in an oil/water solution ranging from 1 to 5%. The laboratory colony eggs were dipped into the oil/water solution, immediately removed and allowed to dry. They were then placed into vented and larva media containing cartons. The cartons were held in an 80°F room for approximately two weeks. As a backup to this observation, the number of surviving larvae were also checked for in the food media. All mixtures were significantly better than the water-only control, even the minimum treatment of 1% oil.

Another test involved the same dipping of eggs into a 1 to 5% mixture of oil/water, but used field-collected NOW eggs rather than lab colony eggs. Here the eggs were laid on baited egg traps where the female moths are attracted to media contained therein. After egg laying occurred, the traps were taken down from the almond orchard trees, dipped into the oil/water solutions and replaced back in the shaded portion of the trees. Over 100°F temperatures immediately after initial treatment prompted an early two-day count. Egg evaluations were made separately for the white, orange and black head stages; the latter being the stage just prior to larval hatch. In these trials where we counted the number of dead eggs per 10 eggs per replication, a definite egg kill progressively occurred as the oil dosage increased. Also, a progression in egg kill occurred within each dosage through time. Although 1 and 2% mixtures were effective, 3% and up gave excellent hatch reduction on white and orange egg stages. The 3% treatment was considerably less effective on the black head stage and required closer to a 5% rate.

Final testing involved a possible grower treatment that could be made at hull split (approximately 40 to 45 days prior to harvest). This is the time most growers apply an insecticide for NOW control. Here we timed the oil application to be applied at egg laying which can occur as the first nut hulls start to split. Since the NOW larvae cannot invade the hull (and then the shell and nut) until hull split, this hull stage is a trigger for control treatments. Adult female moths are attracted to and lay eggs in the split hulls. Counts made two weeks after applying three mixtures of oil and water (2%, 3% and 4%) show a good effect on the eggs as compared to the standard and check. The degree of control at hull split, recorded as percent nut infestation at harvest, resulted in approximately 50% control for 3 and 4% oil. This is often as good as any material obtains.