

Pristine effects on queen rearing success

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There have been reports by commercial queen producers of occasional unexplained loss of large numbers of developing queens in the larval or pupal stage. Many of the affected queen-rearing operations are situated among the almond orchards of California and report these losses in the weeks after almond trees bloom. Almond flowers are a rich foraging resource for bees, but are also commonly treated with fungicides, insecticides and spray adjuvants during bloom to control pests and pathogens. Queen producers have associated queen developmental problems with application of the fungicide Pristine, which contains the active ingredients boscalid and pyraclostrobin, and the spray adjuvants containing organosilicone compounds. To test the effect of these pesticides queens were reared in closed swarm boxes for four days, until capping, with nurse bees fed pollen treated with four concentrations of Pristine (0.4, 4, 40 and 400 ppm), an organosilicone-containing spray adjuvant (Break-Thru, 200 ppm), the combination of Pristine and Break-Thru (400: 200 ppm), diflubenzuron (100 ppm) as a positive control or water as negative control. Low concentrations of pyraclostrobin (50 ppb), but no boscalid, was detectable in royal jelly fed to queens in the 400 ppm Pristine treatment. No significant difference in queen survival was observed between any of the experimental treatments and the negative control. Only diflubenzuron, the positive control, caused a substantial reduction in queen survival. Interestingly, diflubenzuron use in almonds during bloom, at roughly the same time and scale as Pristine application, has seen on a steady increase over the last decade. Future work should focus on the role of diflubenzuron, possibly in combination with other pesticides, on queen development, survival and success.