EVALUATION AND IMPLEMENTATION OF BIORATIONAL INSECTICIDES TO MANAGE CRANBERRY PESTS IN WASHINGTON, 1999

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This was the third year of an ongoing project to evaluate biorational insectticides and integrate them into a program to better manage blackheaded fireworm (BHFW) in Washington State cranberry bogs. Both small plot field trials and large-scale on-farm trials were conducted against that historically important key pest. We also studied the recently introduced cranberry tipworm (CTW) and cranberry fruitworm (CFW). For BHFW, we emphasized the affects of post-application drench, a side-effect of chemigation, and also calibrated the chemigation systems at 5 farms. For the other pests, we examined both new systemic neo-nictinoid compounds, as well as some more readily available and less expensive materials.

Small plot trials against blackheaded fireworm

Treatments lacking a post-application drench showed relative efficacies similar to those demonstrated in previous trials: all biorationals were very effective soon after application, but less so at longer days after treatment (DAT). The *Bt*-based products were least persistent, but affects were still visible at 25 DAT. In spinosad-treated plots, the 900 gpa post-application drench affected abundance of BHFW larvae, but no differences were observed among the 3 lower drench volumes (0, 300, and 600 gpa). The 300 gpa drench was compared with the no-drench for spinosad, Confirm, and Mattch, and reduced pesticide efficacy only for Confirm at 11 DAT. A second trial featuring slightly different treatments showed similar results: a post-application drench # 600 gpa generally did not affect pesticide efficacy.

Small plot trials against cranberry tipworm

First generation larval densities were too low to precisely measure, so field plot trials were timed to the beginning of the second larval generation, which coincided with cranberry bloom. Bees were present at that time, so the standard pesticide, diazinon, was not included. Five other insecticides (thiamethoxam, imidacloprid, cinnamaldehyde, pyrethrin, and flowable sulfur) were applied in combination with one or both of two application dates (July 7 & 15) to create 12 treatments. Cranberry tipworm eggs, first instar larvae, and pupae were not directly affected by any insecticide, but all treatments suppressed second and third instar larvae. All but one treatment was more effective than the untreated check up to 14 DAT. In general, the two neonictinoids (thiamethoxam and imidacloprid) were more effective than cinnamaldehyde or sulfur. Larvae were not always less abundant in plots treated twice than in those treated once. Tipworm decreased in all plots after diazinon was applied to suppress BHFW and continued to decline further during August. Tipworm eggs and larvae disappeared by early September, even though temperatures were still mild.

Whole-farm demonstration trials against BHFW

Insect management programs featuring biorational insecticides varied considerably among and within farms. Both Confirm and Mattch suppressed fireworm larvae, but cool spring temperatures delayed development of first generation larvae so that additional cover sprays were sometimes required. The sprayable encapsulated formulation of BHFW female pheromone (MEC7, 3M Canada) disrupted fireworm mating and suppressed second generation BHFW, even at larger farms with relatively high infestations. In some cases, improperly calibrated or operated chemigation systems led to high pest densities. Finally, the recent introduction of the cranberry fruitworm confounded late-season insect management at some bogs.