

Section 4. Chemical Control/New Products

1998 PERFORMANCE SUMMARY OF SUCCESS* NATURALYTE* INSECT CONTROL

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Success* Naturalyte* insect control is a reduced risk product for control of multiple insect pests across a wide variety of crops. In apples, it has shown high levels of efficacy against leafrollers, leafminers, western flower thrips, and *Lacanobia* fruitworm. Promising results are also being found against codling moth, although more work is needed in the Pacific Northwest against this pest.

Spinosad, the active ingredient in Success, is derived from a naturally-occurring soil bacterium, *Saccharopolyspora spinosa*. It is a member of a new class, Naturalyte (natural metabolite) that combines the high efficacy of synthetic pesticides with the low mammalian and environmental risk of traditional biologicals. Success received a federal registration for apples, almonds, citrus, cole crops, and leafy and fruiting vegetables in spring of 1998. This allowed large scale evaluations under commercial conditions without the need of a crop destruct EUP. The following is a report of some of the large scale commercial trials. Also included are some of the more recent research results.

Commercial Trials.

Commercial applications were made with the cooperation of numerous field advisors and apples growers. Twenty shoots per tree, 5 trees per orchard were sampled, and numbers of live and dead leafrollers were counted. Percent control was calculated by comparing post counts to pretreatment counts. In those orchards where no pretreatments were made, percent control was calculated by dividing the number of dead larvae by the total number of dead plus live. In some of the orchards, leaves were collected and numbers of live and dead leafminer mines per leaf were recorded.

Petal fall timing - Leafrollers. Petal fall applications are the best timing for controlling spring generations of leafrollers with Success. Success was applied at 6 fl.oz./A at petal fall and data collected from 15 orchards. Avg. number of leafrollers per 100 terminals before and after treatment was 18 and 1, respectively, for an average of 94% control.

Petal fall timing - Leafminers Applications for leafrollers at petal fall also have a significant impact on leafminers. In three orchards, percent control of leafminers was compared in blocks treated with or without Success. Percent leafminer control was 42, 51, and 75% (avg. 56%) in the three Success treated blocks, and 6, 19, and 20% (avg. 15%) in the three untreated blocks. No adjuvants were used in these applications. Addition of adjuvants is recommended where control of leafminers is paramount.

Leafrollers - Summer timing. Thirteen orchards were evaluated following commercial applications of Success to summer generation of leafrollers. Application rate averaged 6.4 fl.oz./A. In each orchard, 5 shoots from each of 5 trees were evaluated. Percent mortality was calculated by dividing number of dead by total number of live plus dead. Percent mortality ranged from a low of 78% (2 orchards) to a high of 100% (7 orchards) with average percent mortality $93.23 \pm 8.94\%$. Three of the orchards were compared to standards and one against an untreated check. Percent mortality of leafrollers in the Success, standard, and untreated check orchards was 92.6 ± 9.2 , 70.6 ± 42.2 , and 0 respectively. Leafroller and leafminer control was also compared in four orchards participating in codling moth mating disruption where growers wanted to maintain a "soft" program. Number of larvae per 1000 shoots were counted in each orchard on two sample dates. Total number from all orchards at both dates was 7 and 23 in the Success and Bt treated blocks, respectively. Total cumulative number of leafminers per 500 leaves from all orchards at both dates was 388 and 1,144 in the Success and Bt treated blocks, respectively.

Laboratory trials with adjuvants.

Activity of spinosad against many pests has been shown to improve with the addition of adjuvants. This is particularly true of leafminer control. Laboratory trials were conducted to evaluate effects of adjuvants against cabbage looper on cabbage, tobacco budworm on cotton, and codling moth on apples. EC50's were calculated for spinosad and spinosad plus adjuvants. Data are presented as "Activity Ratios" of adjuvants vs. spinosad alone. Mineral oils significantly improved efficacy of spinosad 3-5.5 fold in the laboratory. Silicon adjuvants also significantly improved spinosad performance 1.8-4 fold. Vegetable oils improved spinosad 1-1.7 fold, which was not statistically significant. In some instances, efficacy decreased with vegetable oils. Acidifying buffers significantly decreased performance of spinosad. Laboratory studies are very sensitive and may or may not translate to significant effects in the field.

Summary

Petal fall applications of Success provided excellent control of leafrollers and significantly reduced leafminer populations. Summer applications also provided excellent control of leafrollers. Previous research has shown importance of using adjuvants for leafminer control. Adjuvants may also significantly improve efficacy against other pests such as codling moths. Acidifying buffers are not recommended. Success proved to be a valuable IPM tool in codling moth mating disruption programs for both leafrollers and leafminers.