**Egyptian Alfalfa Weevil and Pyrethroid Insecticides**

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The UC Statewide IPM Pest Management Guidelines lists many insecticides as effective for Alfalfa (<http://www.ipm.ucdavis.edu/PMG/r1300511.html>). However, these are not the only insecticides registered for control of Egyptian alfalfa weevil on alfalfa grown for hay in California. Some newer products have been evaluated for Egyptian Alfalfa weevil control and are mentioned in this report. Most of those newly registered insecticides are formulations of two different insecticides in the same container and are referred to as ‘in-the-can-mixtures’. An important question that PCA’s and alfalfa growers should be asking: “What are the potential benefits and/or possible harm of using the ‘in-the-can-mixtures’ on alfalfa”?

The efficacy of some of the new and old insecticidal compounds against Egyptian alfalfa weevil (EAW), *Hypera brunnipennis* (Boheman) larvae on alfalfa grown for hay production was evaluated with two year trials conducted under the desert growing conditions during the spring of 2011 and 2012 at the UC Desert Research and Extension Center. Each year, the experimental design was RCB with four replicates per treatment. Broadcast insecticide spray treatments were applied using a Lee Spider Spray Trac, tractor mounted spray boom. The larval EAW populations were counted for each plot using a standard 15-inch diameter insect net consisting of ten 180o sweeps. In 2011 pre-treatment larval EAW populations were sampled on March 2 reported as 7 days pretreatment (7DPT) in Table 1, and on March 12, 2012 (1DPT) in Table 2. Post-treatment samplings in 2011 were on March 11 or 3 days after application (3DAA), March 15, 22, and 29; 7DAA, 14DAA, and 21DAA, respectively ( Table 1). Post-treatment samplings for 2012 were on the March 16, 20 and 27; 3DAA, 7DAA, 14DAA, respectively (Table 2). Data sets were analyzed using a 2-way ANOVA and means separated by protected LSD (*P* ≤ 0.05).

There were no significant differences in the pre-treatment EAW populations for 2011 sampling 7DPT (Table 1) or for 2012 sampling 1DPT (Table 2). The EAW population means for all insecticide treatments, on all post-treatment sampling dates in 2011 and 2012 were significantly lower than the EAW means for the untreated checks in both years. There were no significant differences among the insecticide treatments for 2011, except for Mustang Insecticide at 7DAA that had more EAW larvae than the other insecticide treatments (Table 1). In 2012, numerically, Cobalt Insecticide (an in-the-can-mixture of chlorpyrifos and gamma-cyhalothrin) had the fewest EAW on all post-treatment sampling dates, although not statistically different from Warrior II (lambda-cyhalothrin). Cobalt had significantly fewer EAW larvae than Lorsban Advanced (chlorpyrifos) at 3DAA, 14DAA and for the post treatment sampling averages of 2012 (Table 2).

Results from the two year insecticide efficacy studies do not depict any clear advantage from using ‘in-the-can mixtures’ of insecticides. There may even be a disadvantage to using insecticides that contain a pyrethroid insecticide such as gamma-cyhalothrin a pyrethroid ingredient in Cobalt, lambda-cyhalothrin in Warrior II, and zeta-cypermethrin a pyrethroid ingredient in both Mustang Insecticide and Stallion Insecticide, because pyrethroid insecticides can cause secondary outbreaks of pests such as spider mites and beet armyworm (<http://anrcatalog.ucdavis.edu/pdf/8033.pdf>) and (<http://cdn.intechopen.com/pdfs/27804/InTech-Alternatives_to_chemical_control_of_insect_pests.pdf>). Therefore, the non-pyrethroid insecticides listed in the UC Statewide IPM UC IPM Pest Management Guidelines for Alfalfa (<http://www.ipm.ucdavis.edu/PMG/r1300511.html>) are still efficacious and may be of less risk than the pyrethroid insecticide alone or their combination with other insecticides.

**Management guidelines**. Egyptian alfalfa weevil is usually a problem only during the first cutting, although damaging populations may persist into the second cutting. To sample for weevil larvae, divide the field into 4 or more sections and take 5 sweeps in each section. Divide the total number of weevil larvae by the total number of sweeps to get the average larval population for the field. The treatment threshold is an average of 20 EAW larvae per sweep. Adult EAW do not cause economic damage and are not counted for the treatment threshold; however, emerging adults may signal the end of EAW larval infestations for the year. Serious crop damage can sometimes be prevented by cutting the crop as soon as most of the plants are in the bud stage. Early in the season short alfalfa or stubble following cutting cannot be checked with a sweep net; treatment is warranted when re-growth is retarded by EAW larval feeding. More information on the biology and management guidelines of EAW can be viewed under the **Monitoring and Treatment Decisions** in theStatewide UC IPM Pest Management Guidelines for alfalfa weevils (<http://www.ipm.ucdavis.edu/PMG/r1300511.html>). Pyrethroids are occasionally need for pest control in alfalfa, but they should be used judiciously weighing the benefits against the potential for secondary pest outbreaks.

Table 1.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  | | EAW larvae population per 10 Sweeps in 2011 | | | | |
| Treatment | A.I.s | | Rate/acre | 7DPTy | 3 DAAxz | 7 DAAx | 14 DAAx | 21 DAAx |
| Check | -------- | | -------- | 9.75 a | 29.88 a | 13.25 a | 2.38 a | 1.63 a |
| Mustang Insecticide | zeta-cypermethrin | | 4.3 fl | 9.43 a | 0.25 b | 0.45 b | 0.48 b | 0.63 b |
| Stallion Insecticide | zeta-cypermethrin + chlorpyrifos | | 9.25 fl | 8.50 a | 0.43 b | 0.08 c | 0.10 b | 0.50 b |
| Stallion Insecticide | zeta-cypermethrin + chlorpyrifos | | 11.75 fl | 13.28 a | 0.30 b | 0.05 c | 0.25 b | 0.35 b |
| Cobalt Advanced | chlorpyrifos + gamma-cyhalothrin | | 24.0 fl | 6.68 a | 0.35 b | 0.13 c | 0.20 b | 0.20 b |

Means within columns followed by the same letter are not significantly different, LSD; *P*> 0.05.

x Log10 (X+1) transformed data used for analysis, but actual means are reported.

y Pre-treatment on 2 March 2011

z Days after treatment.

Table 2.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | | EAW larvae population per 10 Sweeps in 2012 | | | | |
| Treatment | | A.I.s | Rate/acre | 1DPTw | 3 DAAxz | 7 DAAz | 14 DAAz | PTAyz |
| Check | | -------- | -------- | 19.75 a | 27.25 a | 22.00 a | 9.00 a | 19.42 a |
| Cobalt Insecticide | | chlorpyrifos + gamma-cyhalothrin | 24 fl oz | 24.50 a | 0.50 d | 0.25 c | 0.00 d | 0.25 d |
| Warrior II | | lambda-cyhalothrin | 1.92 fl oz | 18.75 a | 1.00 cd | 0.50 c | 0.50 cd | 0.67 cd |
| Lorsban Advanced | | chlorpyrifos | 32.0 fl oz | 30.00 a | 8.75 b | 3.00 bc | 3.00 bc | 4.92 b |

Means within columns followed by the same letter are not significantly different, *P*>0.05, LSD.

w Pre-treatment

x Days after application.

y Post treatment average.

z Log10 (X+1) transformed data were used for analysis, but actual means are reported.