Granulate Cutworms Active in Desert Alfalfa

Michael D. Rethwisch and Kassandra W. Allan
University of California Cooperative Extension - Riverside County
Palo Verde Valley office, 290 N. Broadway, Blythe, CA 92225-1649
mdrethwisch@ucanr.edu (760) 921-5064

The second half of July and August of 2019 has noted granulate cutworm feeding activity in area alfalfa, with population levels in many fields at levels necessitating insecticide applications. Finding the caterpillars in alfalfa is a bit more difficult to accomplish than with other foliar feeding insects. Unlike most caterpillars, granulate cutworms feed at night and descend to the soil during the day, thus sweeping foliage during the day won't provide an accurate assessment of cutworm levels.

Many moths that are crop pests have commercial pheromones available for monitoring, however this isn't true for granulate cutworm moths. This summer a series of experimental pheromones were evaluated for monitoring granulate cutworms, but the best pheromones also resulted in the collection of many other moth species as well, not just granulate cutworms.

The more effective pheromones evaluated (2 of 4 were effective) did attract granulate cutworm moths, with one being a potential tool if developed and released commercially, but probably won't be a granulate cutworm only pheromone in the current form due to attracting other moths. If used, it will require granulate cutworm moths to be identified separately from other moths also attracted and captured in the traps. This is actually fairly easy to do as granulate cutworms have some very distinctive markings on the forewings (Fig. 1).

Currently monitoring for granulate cutworms consists of examining the top soil for cutworms and/or examining the foliage for feeding damage (Fig. 2). The latter can be challenging and takes a skilled eye to note foliage with feeding damage and/or missing trifoliates, as there is no highly visible change in leaf appearance as with armyworm feeding.

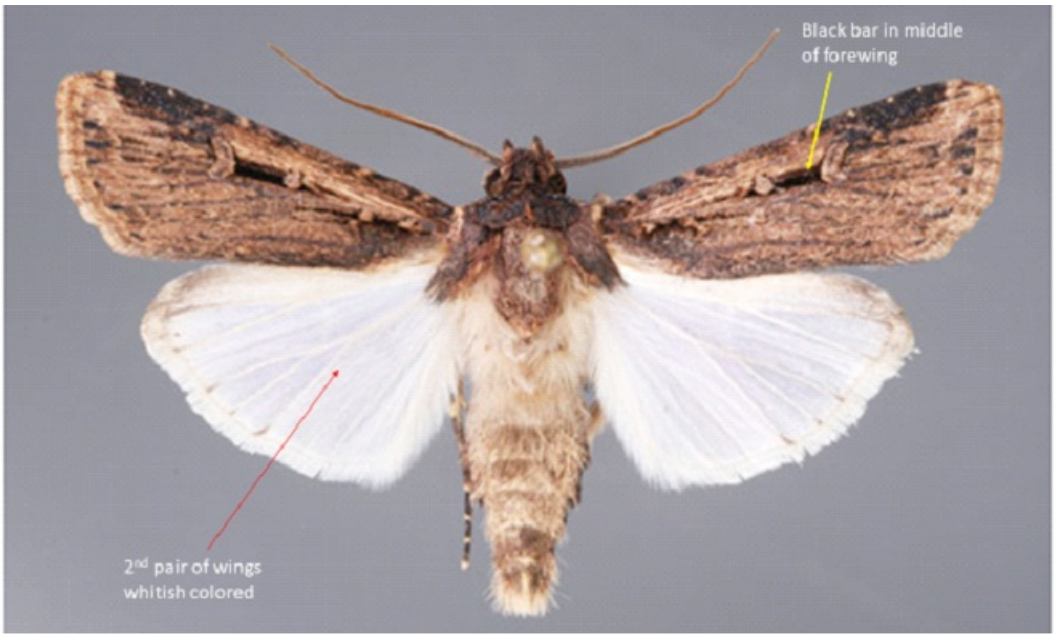

Fig. 1. Granulate cutworm moth with markings and colorations on wing

Fig. 2. Alfalfa with leaves fed on by granulate cutworm caterpillars. Note missing trifoliate leaves in picture on left, and missing tops of expanding trifoliate leaves and notching on other leaflets in picture on right.

A comparative trial for insecticide efficacy using insecticide from different insecticide classes was completed in August. Insecticide classes included:

1) A *Bacillus thuriengensis* insecticide (DiPel® DF)

2) A diamide (group 28) insecticide (Prevathon®, active ingredient = chlorantraniliprole).

3) An oxidiazine (group 22) insecticide (Steward® EC, active ingredient = indoxacarb).

4) An insect growth regulation chemistry (Intrepid® 2F, one of the alfalfa insecticides which contain the active ingredient methoxyfenozide) from the group 18 (diacylhydrazine) class of insecticides.

A field located north of Blythe, CA, which had foliar evidence of granulate cutworm feeding was utilized for this experiment, which consisted of plots that were 14 x 25 feet, with five replications of treatments and a randomized complete block design. Insecticide treatments were applied August 9 with a battery powered backpack sprayer and boom equipped with four T-Jet 8002VS nozzles, delivering 18.6 gpa.

Plots were later sampled with a 15 inch diameter sweep net, with ten 3.5 foot long pendulum sweeps/plot. As granulate cutworm caterpillars feed at night, plots were sampled at beginning at 9:30 p.m. on Aug 11 (3rd night after application). Collected insects were transferred to containers and frozen, with insects later counted and recorded.

Treatment means were statistically analyzed with Tukey's HSD test (JMP Pro, 13.0.0).

Although granulate cutworms were not especially abundant on foliage from 9:30-11 p.m., there were enough cutworms for statistical analyses and some initial comparative data. Three (3) treatments resulted in statistically fewer granulate cutworms than the untreated check (two rates of Prevathon®, and 10 oz./acre of Intrepid® 2F), while other treatments in the experiment resulted in reduced numbers of granulate cutworm caterpillars (Table 1).

It is interesting to note that the lower rate (14 oz./acre) of Prevathon® had the fewest granulate cutworms, however the difference in caterpillar numbers were very slight due to low numbers of granulate cutworms, thus additional testing is needed to verify this observation.

If this trend is indeed found to be accurate, one possible cause may be insecticidal interactions with caterpillar hunter beetles (*Calosoma* sp.), directly or indirectly through feeding on insecticide killed/dying granulate cutworm caterpillars.

These large beetles, often an inch long, are most actively feeding at night and usually hide during the day, and were noted in plots. There are no known published data for the effects of insecticide treatments on these beetles in low desert alfalfa production.

Table 1. Mean number of granulate cutworm caterpillars the early evening of August 11 following application on August 9, 2019, Blythe, CA.

Treatment and rate/acre		Granulate cutworms/10 sweeps
DiPel® DF	2 lbs.	1.2 ab
DiPel® DF	1 lb.	1.6 ab
+ Steward® EC	8 oz.	
Intrepid® 2F	10 oz.	0.4 a
Prevathon®	14 oz.	0.0 a
Prevathon®	20 oz.	0.2 a
Steward® EC	11.3 oz.	1.2 ab
Untreated	-----	3.0 b

P value		*0.0035*

Means in columns followed by the same letter are not statistically different at the p<0.05 level (Tukey-Kramers HSD test, JMP Pro 13.0.0)