Biological Control for Soil Dwelling Insect Pests of Melon Crops

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Purpose: Evaluate potential treatments with entomopathogenic fungi and new conventional insecticides for mortality on *Blapstinus* spp. beetles in field planted melons at UC Desert Research & Extension Center (DREC).

Table 1. Treatment List for Darkling Ground Beetle in Cantaloupe Melons, Holtville, CA, 2013

Treatment	Amount/acre	Application date
1. Sevin Bran bait 5%	20 lb	23 & 30 May and 6 & 13 June
2. Ambush Bait 0.05%	20 lb	23 & 30 May and 6 & 13 June
3. Met_{52} EC	130.68 fl oz	23 & 30 May and 6 & 13 June
4. Ma Granules	2860 g	23 & 30 May and 6 & 13 June
5. Ma Broth Spray	10 L	23 & 30 May and 6 & 13 June
6. Met_{52} granules	36 lb	23 & 30 May and 6 & 13 June
7. Altrevin	1.5 lb	23 & 30 May and 6 & 13 June
8. Seduce	36 lb	23 & 30 May and 6 & 13 June
9. Check	----------	----------

Methods:

Plot size: 50' X 13.33' (2 beds/plot on 80" centers); one buffer bed between plots and 10' buffers between blocks. The experimental design was a Randomized Complete Block with 4 replicates.

Granule applications were spread evenly over the plots using a hand-held fertilizer spreader. Foliar sprays were applied using a tractor-mounted spray boom with TJ-60 11003VS nozzle/delivering 36.25 gpa at 55 psi. All granule and spray treatments were applied on 23 & 30 May and 6 & 13 June 2013.

Each plot was evaluated for the numbers of *Blapstinus spp.* beetles per 25 melon fruit on 10 and 18 June 2013, percentages of beetle damaged fruit per 25 fruit per plot on 10, 18 and 27 June 2013, and numbers and weight (kg) for fruit per 0.001 acre on 27 June.

Results:
There were no differences among the treatment for numbers of *Blapstinus spp.* on 10 June 2013 (Table 2). All treatments except Ma Granules at 2860 g per acre, Ma Broth Spray at 10 L per acre, and Seduce insecticide granules at 36 lb per acre had significantly (P>0.05) fewer *Blapstinus spp.* beetles per Melon Fruit than the untreated control on 18 June 2013. There were no differences among the treatments and the untreated control for percentages of *Blapstinus spp.* beetle damaged fruit on 10 and 27 June 2013, and only Ambush Bait 0.05% at 20 lb per acre had a significantly lower percentage of *Blapstinus spp.* beetle damaged fruit on 18 June (Table 3). There were no differences among the treatments for numbers of fruit or weight of the fruit per 0.001 acres (Table 4).

Table 2. Number of *Blapstinus spp.* beetles per Melon Fruit, Holtville, CA, 2013

Treatments	Amount/acre	10 June	18 June
Sevin Bran bait 5%	20 lb	0.49 a	0.14 cd
Ambush Bait 0.05%	20 lb	0.36 a	0.05 d
Met_{52} EC	130.68 fl oz	0.53 a	0.18 bcd
Ma Granules	2860 g	0.76 a	0.37 ab
Ma Broth Spray	10 L	0.52 a	0.28 abc
Met_{52} granules	36 lb	0.51 a	0.11 cd
Altrevin	1.5 lb	0.71 a	0.17 bcd
Seduce	36 lb	0.90 a	0.30 abc
Check	----------	0.50 a	0.47 a

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

Table 3. Percentages of *Blapstinus spp.* beetle damaged melon fruit, Holtville, CA, 2013

Treatments	Amount/acre	10 June	18 June[z]	27 June
Sevin Bran bait 5%	20 lb	6.00 a	19.09 ab (12.00)	27.50 a
Ambush Bait 0.05%	20 lb	7.00 a	9.88 c (4.00)	33.80 a
Met_{52} EC	130.68 fl oz	5.00 a	17.48 bc (10.00)	36.30 a
Ma Granules	2860 g	9.00 a	25.59 a (19.00)	41.30 a
Ma Broth Spray	10 L	15.00 a	17.95 ab (10.00)	58.70 a
Met_{52} granules	36 lb	7.00 a	16.52 bc (9.00)	33.80 a
Altrevin	1.5 lb	15.00 a	16.99 bc (9.00)	56.30 a
Seduce	36 lb	19.00 a	20.96 ab (13.00)	31.30 a
Check	----------	9.00 a	23.98 ab (17.00)	41.20 a

Means followed by the same letter within columns are not significantly different LDS, $P>0.10$.
[z]Arcsine transformed data used in the statistical analysis; actual percentages in parenthesis.

Table 4. Weight (kg) and Number of Melon Fruit per 0.001 acre, Holtville, CA, 2013

Treatments	Amount/acre	Numbers of Fruit	Kg of Fruit
Sevin Bran bait 5%	20 lb	20.25 a	27.10 a
Ambush Bait 0.05%	20 lb	20.25 a	27.75 a
Met_{52} EC	130.68 fl oz	18.75 a	27.84 a
Ma Granules	2860 g	23.50 a	33.03 a
Ma Broth Spray	10 L	14.50 a	20.19 a
Met_{52} granules	36 lb	23.75 a	33.69 a
Altrevin	1.5 lb	19.25 a	25.83 a
Seduce	36 lb	22.75 a	30.92 a
Check	----------	21.50 a	30.38 a

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