

# Field Efficacy Evaluation of Novodor FC and VBC-60149 ES for Control of Colorado Potato Beetle on Potato

## 2008 Report

Submitted to the Valent BioSciences Corporation

Galen P. Dively, Terry Patton, and Amy Miller  
Department of Entomology, University of Maryland, College Park, MD 20742  
(301) 405-7524, (202) 812-9828 cell, [galen@umd.edu](mailto:galen@umd.edu)

Potato seed pieces (var. Kennebec) were planted on 2 April and spaced 10 inches apart within rows at the Central Maryland Research and Education facility, Upper Marlboro, Maryland. Standard agronomic practices were applied, including overhead irrigation as needed. Six treatments (two Novodor rates, three VBC60149 rates, Entrust as a standard treatment) plus the untreated control were arranged in a randomized block design with four replicates. Individual plots measured three rows 15 ft long spaced 36 inches apart. An application of each treatment was applied on 23 May when 10% of the egg masses hatched, followed by a second treatment on 2 June. All treatments were applied using a CO<sub>2</sub> backpack sprayer calibrated to deliver 20 gal/acre at 40 psi. A 10 ft boom covered each plot with six flat fan nozzles directed over the top of the foliage.

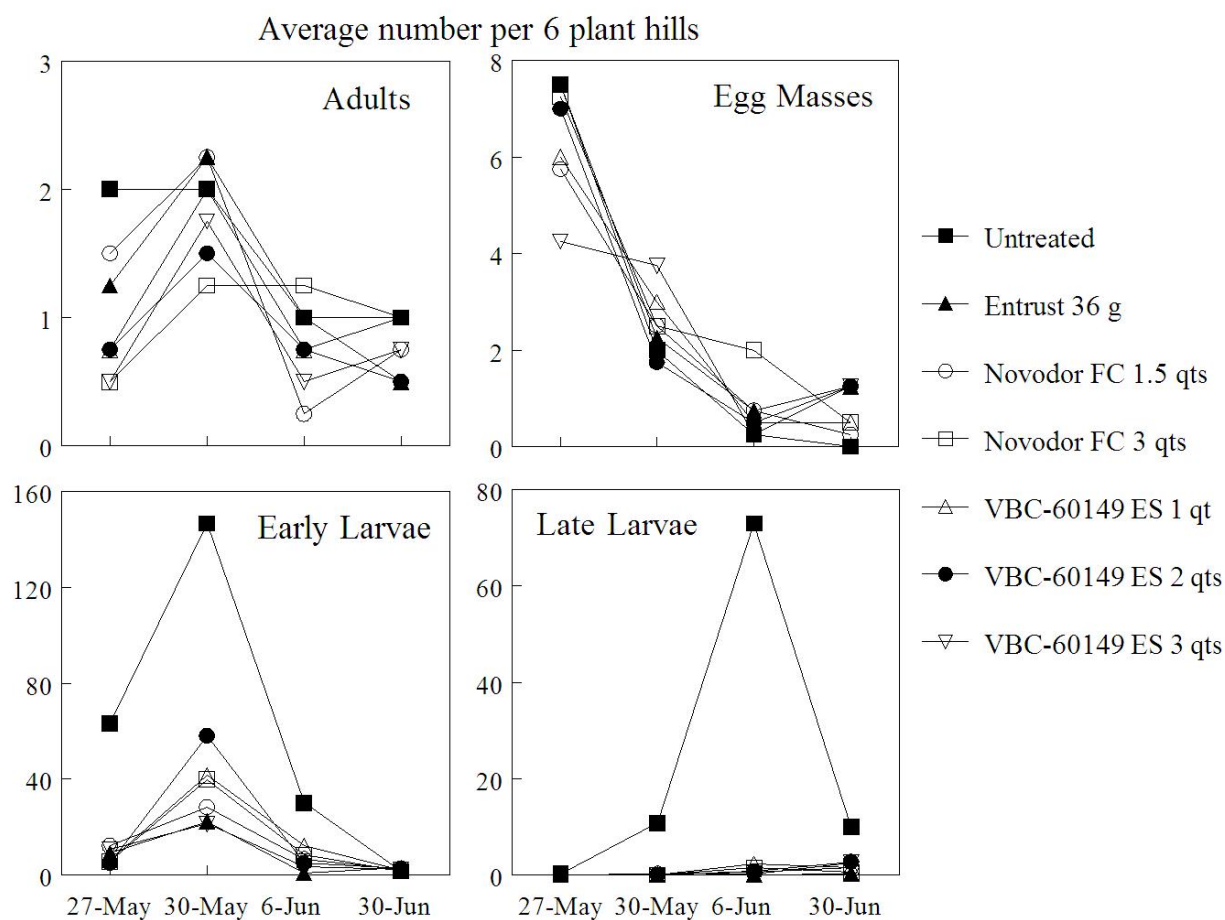
Sampling for Colorado potato beetle was conducted on 27 May and 30 May (4 and 7 days post first treatment), and on 6 June and 10 June (4 and 8 days post second treatment) by counting adults, egg masses, small larvae (1st and 2nd instars), and large larvae (3rd and 4 instars) on six plant hills of the middle row of each plot. Mixed model SAS procedure was used to test for treatment effects after adjustments were made for lack of normality. The Tukey option was used to test for significance among multiple mean comparisons.

Colonizing densities of Colorado potato beetles and larval injury exceeded economic levels but were not as high as previous infestations encountered at this location. Defoliation caused primarily by late larvae in the untreated plots ranged from 30 to 50% on 10 June. Normally, untreated control plots are completely defoliated. Treatment and treatment by date differences in adult and egg masses were not significant ( $P$  ranged from 0.31 to 0.98) (Fig. 1). All treatment plots had significantly fewer early and late larvae compared to counts in untreated plots, and differences were greatest at four days post-treatment for early larvae (treatment by date interaction:  $F_{(18,54)} = 2.55$ ,  $P = 0.004$ ) and late larvae (treatment by date interaction:  $F_{(18,60)} = 5.67$ ,  $P < 0.001$ ). Table 1 summarizes the main treatment effects based on the count data averaged over sampling dates. Larval infestations in plots treated with Entrust and the high rate of VBC-60149 were consistently lower but not statistically different. Contrast tests comparing the pooled treatments of Novodor and VBC-60149 showed no significant differences in densities of early and late larvae ( $P = 0.56$  and  $0.90$ , respectively). Control efficacy of both microbial products was not significantly improved with an increase in rate. The lower rates of Novodor and VBC-60149 reduced larval infestations below economic levels and achieved control efficacy comparable to Entrust.

**Table 1.** Effects of Novodor and VBC liquid formulations and Entrust on Colorado potato beetle populations in potato. Data are averaged over all sampling dates. Central Maryland Research and Education Center, Upper Marlboro, MD. 2008.

Treatments		Colorado potato beetle stages per 6 plants			
Formulation	Rate/acre	Adults	Egg masses	Early larvae (instars 1+2)	Late larvae (instars 3+4)
Entrust	36 g	1.3	2.9	8.8 b	0.1 b
Novodor FC	1.5 qts	1.2	2.3	12.3 b	0.6 b
Novodor FC	3.0 qts	1.0	3.1	13.8 b	0.5 b
VBC-60149	1 qt	1.1	2.5	15.3 b	0.9 b
VBC-60149	2 qts	0.9	2.6	17.6 b	0.9 b
VBC-60149	3 qts	0.9	2.4	9.4 b	0.7 b
Untreated		1.5	2.4	60.4 a	23.5 a

Means within a column followed by the same letter or no letters are not significantly different ( $P=0.05$ ).



**Figure 1.** Average numbers of adults, egg masses, early larvae (instars 1+2), and late larvae (instars 3+4) of Colorado potato beetle in potato plots treated with Novodor and VBC liquid formulations and Entrust. Data are shown for each sampling date. Central Maryland Research and Education Center, Upper Marlboro, MD. 2008.