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Collard: *Brassica oleracea* L. (Acephala group) Var 'Bull Dog'

CONTROL OF DIAMOND BACK MOTH ON COLLARD, 2008

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Diamond Back Moth , *Plutella xylostella* (L.),

Diamondback moth is the key pest of cole crops in south Florida and much of the tropics and subtropics of the world. Defoliation and loss of quality by this pest are often difficult to avoid due to rapid development of resistance to insecticides. For this trial, greenhouse raised plants were transplanted into raised beds covered with polyethylene mulch on 8 – Oct 2007 in six, beds 235 ft in length with 18 inch plant spacing within the row. The center row of each three row section was left untreated. A randomized complete block (RCB) design was used with 8 treatments, 4 replications; each plot contained 16 plants with an additional three plants left as buffer between plots. Water and fertilizer were provided by drip irrigation. Approximately 20% of the fertilizer was preplant soil

incorporated and 80% applied through the drip tape. Pest pressure was low in the fall so the main stems on the plants within the treated areas were cut down in January 2008 and the side shoots were allowed to develop. Foliar treatments were applied with a high clearance sprayer operating at 180 psi and 2.3 mph equipped with 7 yellow Albuz® hollow cone nozzles, 3 on each of 2 vertical booms and one overhead to apply 70 gpa. Products were sprayed either every 7 or 14 days depending on the treatment protocol and all applications, except for one VBC-60129 included the adjuvant Kinetic at a rate of 0.05 % vol/vol.

Diamondback moth larvae and pupa were monitored weekly samples on 4 fully developed new leaves on the upper third of the plant from each of 4 plants in a plot. Randomly selected leaves were also evaluated for the amount of damage caused by diamondback larvae and pupa and given a defoliation rating based on the following criteria: 0 = no damage; 1 = less than 5% of leaf surface with damage; 2 = greater than 5% but less than 15% of leaf surface with damage; 3= greater than 15% but less than 30% of leaf surface with damage; and 4 = more than 30 % of leaf surface with damage.

Significant differences in numbers of DBM larvae were observed 18 Feb and 10-31 March. On all these dates and over all dates, all treatments significantly reduced the number and pupa recorded per leaf compared to the untreated check. Kinetic improved the performance of VBC – 60129 only on 17 Mar. Among 14-day treatments Spintor was superior to all Bt products over all dates. All 7-day treatments were superior to 14-day treatments with no differences among the former. In regard to damage, Spintor provided

better protection than all Bt products at both 7 and 14 day intervals with no differences between intervals. Increasing frequency of Dipel from 7 to 14 da did not improve efficacy although sprays at the 7-day interval were better than VBC – 60129 at the 14 day interval. Otherwise, there were no significant differences among Bt. products.

Table 1:

		Treatment Date							
Product	Frequency (days)	5-Feb	12-Feb	19-Feb	25-Feb	3-Mar	10-Mar	17-Mar	25-Mar
Untreated	NA								
VBC w/o Kinetic	14	x		x		x		x	
VBC - 60129	14	x		x		x		x	
Dipel	14	x		x		x		x	
Spintor	14	x		x		x		x	
VBC - 60129	7	x	x	x	x	x	x	x	x
Dipel	7	x	x	x	x	x	x	x	x
Spintor	7	x	x	x	x	x	x	x	x

Table 2:

		Average Total Number of Larvae and Pupae per leaf								
Product	Frequency (days)	11-Feb	18-Feb	25-Feb	3-Mar	10-Mar	17-Mar	24-Mar	31-Mar	All Dates
Untreated	NA	0.11 a	0.32 a	0.45 a	0.13 a	0.10 a	0.58 a	0.94 a	0.80 a	0.42 a
VBC w/o Kinetic	14	0.09 a	0.16 b	0.23 b	0.06 a	0.08 a	0.30 b	0.09 bc	0.30 bc	0.16 b
VBC - 60129	14	0.08 a	0.11 bc	0.14 bc	0.05 a	0.06 ab	0.16 c	0.22 b	0.47 b	0.16 b
Dipel	14	0.11 a	0.13 bc	0.03 cd	0.09 a	0.06 ab	0.09 cd	0.25 b	0.41 b	0.14 b
Spintor	14	0.02 a	0.08 bc	0.05 cd	0.02 a	0.00 b	0.02 d	0.00 c	0.22 cd	0.04 c
VBC - 60129	7	0.11 a	0.05 bc	0.11 bcd	0.05 a	0.03 ab	0.02 d	0.03 c	0.09 de	0.06 c
Dipel	7	0.09 a	0.05 bc	0.03 cd	0.08 a	0.00 b	0.02 d	0.11 bc	0.17 cde	0.07 c
Spintor	7	0.06 a	0.02 c	0.00 d	0.02 a	0.00 b	0.00 d	0.00 c	0.03 e	0.02 c

Means within a column followed by the same letter are not significantly different (LSD $P<0.05$)

Table 3:

		Average Defoliation Rating per Leaf								
Product	Frequency (days)	11-Feb	18-Feb	25-Feb	3-Mar	10-Mar	17-Mar	24-Mar	31-Mar	All Dates
Untreated	NA	1.34 a	1.17 a	1.38 a	0.81 a	0.58 a	1.56 a	2.00 a	2.40 a	1.40 a
VBC w/o Kinetic	14	0.81 c	0.84 b	0.98 b	0.47 b	0.43 ab	0.92 b	0.38 c	0.91 bc	0.72 b
VBC - 60129	14	0.78 c	0.81 b	0.67 c	0.54 b	0.44 ab	0.73 b	0.75 b	1.04 b	0.72 b
Dipel	14	0.70 c	0.63 bc	0.45 de	0.55 b	0.59 a	0.73 b	0.91 b	0.73 cd	0.66 bc
Spintor	14	0.69 c	0.75 b	0.22 f	0.11 d	0.09 c	0.14 d	0.31 cd	0.58 de	0.36 de
VBC - 60129	7	1.17 ab	0.82 b	0.61 cd	0.42 bc	0.25 bc	0.39 c	0.38 c	0.36 e	0.55 bcd
Dipel	7	0.94 bc	0.45 c	0.36ef	0.58 ab	0.30 bc	0.23 cd	0.28 cd	0.63 d	0.47 cd
Spintor	7	0.77 c	0.41 c	0.17 f	0.17 cd	0.09 c	0.19 cd	0.08 d	0.09 f	0.25 e

Means within a column followed by the same letter are not significantly different (LSD $P<0.05$)

Table 3:

		Treatment Date							
Product	Frequency (days)	5-Feb	12-Feb	19-Feb	25-Feb	3-Mar	10-Mar	17-Mar	25-Mar
Untreated	NA								
VBC w/o Kinetic	14	x		x		x		x	
VBC - 60129	14	x		x		x		x	
Dipel	14	x		x		x		x	
Spintor	14	x		x		x		x	
VBC - 60129	7	x	x	x	x	x	x	x	x
Dipel	7	x	x	x	x	x	x	x	x
Spintor	7	x	x	x	x	x	x	x	x

Part II: Materials Tested for Arthropod Management

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Common name	Trade name/ Cultivar	Concentration/ Formulation	Chemical name	Manufacture/source
Bacillus thuringiensis	Dipel	1 DF	*Bacillus thuringiensis* *Kurstaki strain* ABTS - 351	Valent Biosciences Corporation

				870 Technology Way Suite 100 Libertyville IL 60048
Bacillus thuringiensis	VBC - 60129	1 DF	*Bacillus thuringiensis*	Valent Biosciences Corporation 870 Technology Way Suite 100 Libertyville IL 60048
Spinosad	Spintor	2 SC	Spinosad(a mixture of spinosyn A and spinosyn D)	Dow AgroSciences LLC 9330 Zionsville Road Indianapolis, IN 46268-1189