

(E18)

CABBAGE: *Brassica oleracea capitata* (L.), 'Solid Blue'

Diamondback moth (DBM); *Plutella xylostella* (L.)

Cabbage looper (CL); *Trichoplusia ni* (Hbn.)

Cross-striped cabbageworm (CSCW); *Evergestis rimosalis* (Guenée)

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CONTROL OF LEPIDOPTERAN PESTS ON CABBAGE WITH SELECTIVE INSECTICIDES,

1999: Rotations of selective insecticides can provide a viable strategy to provide effective control while conserving natural enemies and reducing selection for resistance. This trial was conducted on two sets of 3 beds, 240 ft long on 6 ft centers and separated by a 15 ft drive. These beds were prepared by incorporating 800 lb/acre 5-16-8 NPK, fumigating with 300 lb/acre of 67/33% methyl bromide/chloropicrin, laying a single drip-tape irrigation line with 12-inch emitter spacing and covering with a white-face polyethylene mulch. Greenhouse-grown cabbage seedlings were transplanted on 2 Mar in a single row at 18-inch spacing and fertigated with a 8-0-8 mixture to provide a total of 150 lbs N and K/acre for the growing season. The middle bed in each set was left untreated to serve as inoculum source of the target pests. The remaining 4 rows were considered as a replicate and divided into 8 plots 30 ft long to which treatments were assigned in a RCB. Plants were sprayed with Bravo 720 at 1.5 pt/acre after transplanting for disease control. Plants (N = 25 per replicate) were checked for the presence of target pests on 12 Apr and treatments initiated after an average of 2.0 DBM larva/plant was observed. All treatments were sprayed on 13, 20, 27 Apr and 4, 11 May at a rate of 33 gpa using a high clearance sprayer equipped with 3 yellow hollow cone Albuz® ceramic nozzles/row, 1 overhead and 1 on each side, operating at 200 psi of pressure except for SpinTor which was not sprayed on 4 and 11 May. Evaluations were made on 19, 26 Apr and 3, 11 May on 10 randomly selected plants/plot, counting DBM, CSCW and CL larvae in 3 size categories: ? 1/4 inch long = small, > 1/4 ? 1/2 inch long = medium, and >= 1/2 inch long = large. A quantitative foliar damage rating was also made on a 0-5 scale: 0 = no damage, 1 = 0-1 % minor feeding on outer leaves, 2 = 2-5 % leaf damage, no head damage, 3 = 6-10 % leaf area eaten, minor feeding on head, 4 = 11-30 % leaf damage with moderate feeding on head and 5 = >30 % leaf damage and numerous feeding scars on head. On 16 May, the 12 largest heads per treatment were harvested and graded for marketability based on amount of insect damage. "Fancy" had no more than 1% insect damage to wrapper leaves and no damage to the head. "Standard" had between 2% and 10% damage to wrapper leaves and no damage to head. Damaged heads were counted as "Unmarketable." Means were separated by Fisher's LSD contingent on a significant F value obtained by analysis of variance.

The primary pest was the DBM, accounting for over 90 % of larvae observed. Fewest larvae over all types and size classes were seen on plants treated with SpinTor, followed by Match and the Javelin/Agree rotation. The next level of control was seen with Javelin or Agree alone, or the Neemix + Javelin tank mix. Neemix alone provided significant control compared to untreated plants. The harvest data reflected similar trends with all plants sprayed with SpinTor providing marketable heads, although not significantly more than from plants sprayed with either Javelin and Agree sprayed alone or in rotation. On the other hand, the mean number of marketable heads from Neemix alone was not significantly different from the control. SpinTor was clearly the superior product at the rate used, although Bt products proved themselves as viable alternatives.

TABLE 1.

Treatment/formulation	Rate amt/acre	No. larvae/head (all dates)						
		DBM				Other larvae ^a	All larvae	Damage rating
		Small	Medium	Large	Total			
SpinTor 2 SC	4 oz	0.02d	0.01e	0.02e	0.05e	0.0c	0.05e	0.81e
Match	2 qt	0.08d	0.18cde	0.23de	0.49d	0.05c	0.54d	1.64d
Javelin WG	1 lb	0.26bc	0.36c	0.54c	1.16c	0.02c	1.18c	1.80cd
Agree WG	1 lb	0.27b	0.29c	0.51c	1.07c	0.01c	1.08c	1.95c
Javelin rotated with Agree	1 lb, 1 lb	0.11cd	0.13de	0.31cd	0.55d	0.04c	0.59d	1.62d
Neemix 4.5 %	4 oz	0.66a	0.91b	1.28b	2.85b	0.53a	3.38b	2.62b
Neemix + Javelin	4 oz, 0.5 lb	0.29b	0.26cd	0.51c	1.06c	0.03c	1.09c	1.75cd
Untreated check	—	0.71a	1.28a	2.36a	4.35a	0.36b	4.71a	3.02a

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

^aIncludes CSCW and CL.

TABLE 2.

Treatment/formulation	Rate amt/acre	Heads No. and Wt. in different grades/12 heads per plot							
		Marketable						Unmarketable	
		Fancy		Standard		Total		No	Wt
		No	Wt	No	Wt	No	Wt		
SpinTor 2 SC	4 oz	11.1a	53.8c	1.0a	4.0b	12.0a	57.8a	0.0d	0.0e
Match	2 qt	1.3b	6.5b	8.7b	43.9a	10.0ab	50.5a	2cd	8.5de
Javelin WG	1 lb	0.2b	1.2b	7.0b	32.7a	7.2c	33.9b	4.8b	22.2bc
Agree WG	1 lb	1.3b	6.5b	8.4b	40.7a	9.7abc	47.2ab	2.3bcd	10.5ode
Javelin rotated with Agree	1 lb, 1 lb	0.5b	2.6b	9.0b	42.4a	9.5abc	45.0ab	2.5cbd	11.6ode
Neemix 4.5 %	4 oz	0.0b	0.0b	2.8a	11.5b	2.8d	11.5c	9.2a	32.4ab
Neemix + Javelin	4 oz, 0.5 lb	1.2b	6.7b	7.8b	36.2a	9.0bc	42.9ab	3.0cb	13.0cd
Untreated check	—	0.0b	0.0b	2.0a	8.1b	2.0d	8.1c	10.0a	41.8a

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