Cabbage: *Brassica oleracea* L. 'Gideon'
Imported cabbageworm (ICW); *Pieris rapae* (L.)
Cabbage looper (CL); *Trichoplusia ni* (Hübner)
Diamondback moth (DBM); *Plutella xylostella* (L.)

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INSECTICIDAL CONTROL OF LEPIDOPTERAN PESTS IN MINNESOTA CABBAGE, 2000: 'Gideon' was seeded 10 Jun at the University of Minnesota Agricultural Experiment Station at Rosemount, MN. Treatments were arranged in a RCB design with 4 replications. Plots consisted of 3 rows, 25 ft (7.6 m) long with 40 inch (1.02 m) row spacing. Each replicate was separated by a 10 ft (3.04 m) alley. Treatment applications were made with a CO_2 pressurized backpack sprayer using a 10 ft boom with 6 nozzles (XR-Teejet 8002 flat fan, with no screen). The sprayer was calibrated to deliver 20 gpa (187.04 l/ha) at 35 psi (242 kPa). Kinetic surfactant was added to all treatments, at a rate of 1.6 fl oz/gal (1.25 ml/liter), except the 2 rates of DPX MP062 30WG which were at a rate of 0.08 fl oz/gal (0.625 ml/liter) of Kinetic and Confirm 2F which used Latron CS-7 surfactant at a rate of 1.6 fl oz/gal (1.25 ml/liter). Four applications were made 1, 7, 14, and 21 Aug. Treatments were evaluated for CL, ICW and DBM larval infestation 10 and 29 Aug. All larval counts were taken from the middle row of each plot. Plots were harvested 30 Aug. In each treatment, 2 sets of 5 consecutive heads, with 4 wrapper leaves on each head, were harvested from the middle row and evaluated for feeding damage using Greene's rating scale (J. Econ. Entomol. 1969 62: 798-800), where: 1= no feeding damage; 2= minor feeding damage on the wrapper leaves (0-1% eaten) with no head damage; 3= moderate feeding damage on the wrapper leaves (2-5% eaten) with no head damage; 4= moderate feeding damage on the wrapper leaves (6-10% eaten) and minor feeding scars on the head; 5= moderate to heavy feeding on the wrapper leaves (11-30% eaten) and moderate feeding scars on the head; 6= greater than 30% of the wrapper leaves eaten and numerous feeding scars on the head. The number of larval contaminants within the 4 wrapper leaves and head were also noted.

Preliminary larval counts were taken 31 Jul. Preliminary counts revealed an average of 0.5 small ICW, 0.25 large ICW, 1.25 ICW pupae, 0.75 small CL, 0.25 medium CL, 0.25 large CL and 3.0 total DBM per 10 heads. Dominant insect pests were ICW and CL. The first sample on 10 Aug was taken after 2 applications and the second sample was taken on 29 Aug after 4 applications. On the first sample date, because of light pest pressure, there were no significant differences in control for any pest species in any treatment compared with the untreated check. For the second sample date, all treatments performed significantly better than the untreated check for control of ICW and DBM. All treatments provided significant control for total CL except Dipel, Confirm, Mustang and Proclaim. On the second sample date, all treatments provided significant control of medium and large CL except for Dipel and Mustang treatments for medium CL. However, there were no significant differences in control for small CL, which may reflect high egg populations and continual egg

hatch and/or insufficient residual control. Compared to the check, all treatments, except for Dipel and Confirm, significantly improved marketability and significantly reduced the incidence of larval contaminants. No phytotoxicity was observed.

		10 Aug					
		Larval-pupal density (avg./10 heads)					
Treatment/formulation	Rate (lb AI or P / ac)	Total ICW[1]	Small CL	Medium CL	Large CL	Total CL[1]	Total DBM[1]
Warrior T 1CS	0.025	0.00	0.25	0.75	0.00	1.50	0.25 b
Capture 2EC	0.04	0.00	0.00	0.00	0.00	0.00	0.50 b
Spintor 2SC	0.094	0.00	0.00	0.50	0.00	0.50	0.25 b
DPX MP062-184 30WG	0.045	0.00	0.00	0.00	0.00	0.00	0.50 b
DPX MP062-184 30WG	0.065	0.00	0.00	0.00	0.00	0.00	1.00 ab
Proclaim 5SG	0.01	0.25	0.25	0.50	0.00	0.75	0.50 b
Mustang 1.5EW	0.0375	0.75	0.00	0.75	0.00	0.75	0.75 ab
Confirm 2F	0.12	1.00	0.50	0.75	0.00	1.25	3.00 a
Dipel DF	1 lb P	0.25	0.00	0.50	0.25	1.00	1.25 ab
Untreated check	--	1.25	0.00	0.75	0.00	1.00	1.50 ab
		NS	NS	NS	NS	NS	

Means within columns followed by the same letter are not significantly different (P=0.05); Ryan-Einot-Gabriel-Welsch multiple range test (REGWQ).
[1]Total includes all larval instars and pupae. NS = not significant ANOVA.

Treatment/formulation	Rate (lb AI or P / ac)	29 Aug: Larval-pupal density (avg./10 heads) Total[1] ICW	Small CL	Medium CL	Large CL	Total[1] CL	Total[1] DBM	30 Aug (Harvest) Avg. larval[2] contaminant / 10 heads	Market-ability rating[3]
Warrior T 1CS	0.025	0.00 b	2.50 bc	2.25 cd	0.00 c	5.00 d	0.50 b	0.00 b	1.00 d
Capture 2EC	0.04	0.00 b	0.50 c	0.00 d	0.00 c	0.50 d	0.00 b	0.00 b	1.00 d
Spintor 2SC	0.094	0.50 b	6.75 abc	3.25 bcd	0.25 c	10.25 cd	0.00 b	0.25 b	1.10 cd
DPX MP062-184 30WG	0.045	0.25 b	6.50 abc	1.50 cd	0.50 c	8.50 d	0.00 b	0.50 b	1.20 bcd
DPX MP062-184 30WG	0.065	0.00 b	4.25 abc	0.00 d	0.00 c	4.25 d	1.25 b	0.00 b	1.13 bcd
Proclaim 5SG	0.01	1.75 b	10.00 abc	5.00 bcd	0.00 c	15.00 a-d	0.25 b	0.00 b	1.18 bcd
Mustang 1.5EW	0.0375	0.75 b	12.75 ab	8.00 abc	2.25 b	23.75 abc	0.50 b	0.00 b	1.15 bcd
Confirm 2F	0.12	0.50 b	10.00 abc	3.50 bcd	0.00 c	13.50 abc	3.50 a	0.25 b	1.55 ab
Dipel DF	1 lb P	0.50 b	14.00 a	10.00 ab	1.25 bc	25.75 ab	0.50 b	0.25 b	1.43 abc
Untreated check	--	4.75 a	8.50 abc	14.00 a	5.00 a	29.00 a	4.25 a	2.50 a	2.75 a

Means within columns followed by the same letter are not significantly different (P=0.05); Ryan-Einot-Gabriel-Welsch multiple range test (REGWQ).

[1]Total includes all larval instars and pupae.

[2]Larval contaminants include all larval instars and pupae of all three species (ICW, CL, and DBM) found within the head or 4 wrapper leaves.

[3]Greene's rating system; refer to text. Mean separation test run on rank transformed data; untransformed means are presented.

Part II. Materials Tested for Arthropod Management

INSECTICIDAL CONTROL OF LEPIDOPTERAN PESTS IN MINNESOTA CABBAGE, 2000

Warrior T 1CS, (3-(2-Cloro-3,3,3-trifluoro-1-propenyl)-2,2dimethylcyclopropanecar-boxylate (S),(S)-cis-Z isomers, lambdacyhalothrin, Syngenta

Capture 2EC, (2-Methyl-1(1,1'-biphenyl)-3yl)methyl cis-3-(2-chloro-3,3,3-trifluoro propenyl)-2, 2dimethyl cyclopropane carboxylate), bifenthrin, FMC

Spintor 2SC, (2((6-Deoxy-2,3,4-tri-O-methyl-a-L-mannopyronaosyl)oxy)-13-((5-(dimethylamino)tetrahydro-6-methyl-2H-pyran-2-yl)oxy)-9-ethyl 2,3,2a,5a,5b,6,9,10,11,12,13,14,16a,16b-tetradecahydro-14-methyl-1H-as-indaceno(3,2,-d)oxacyclododecin-7,15-dione), spinosad, Dow AgroSciences

DPX MP062-184 30WG, (Ideno(1.2-e)(1,3,4)oxadiazine-4a (3H)-carboxylic acid, 7-chloro-2,5-carbonyl)-,methyl ester), indoxacarb, DuPont

Proclaim 5SG, (Epi-methylamino-4"-deoxy-avermectin B,hydrochloride and a maximum 20% 4"-epi-methylamino 4"-deoxyavermectin B benzoate), emamectin benzoate, Syngenta

Mustang 1.5EW, zetamethrin, FMC

Confirm 2F, (3,5-Dimethylbenzoic acid 1-(1,1-dimethylethyl)-2-(4-elhylbenzoyl) hydrazide), tebufenozide, Rohm and Haas

Dipel DF, (Microbial insecticide containing viable spores and/or the Cry1Aa, Cry1Ab, Cry1Ac, Cry2A, or Cry2B toxins from *Bacillus thuringiensis kurstaki*), *Bacillus thuringiensis kurstaki*, Abbott Laboratories

Latron CS-7, (Blend of alkyl aryl polyethoxylate and sodium salt of alkylsulfonatedalkylate 60%), Rohm and Haas

Kinetic, Polyalkyleneoxide modified polydimethylsiloxane and non-ionic surfactants, Helena