

PEPPER (BELL): *Capsicum annuum* L., 'King Arthur'
European corn borer (ECB); *Ostrinia nubilalis* (Hübner)
Fall armyworm (FAW); *Spodoptera frugiperda* (Smith)

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CONTROL OF EUROPEAN CORN BORER ON RED BELL PEPPERS WITH SPINOSAD, 1997: Peppers were transplanted into twin-row beds on 11 June 1997 at Fremont, Ohio. Plants were 16 inches apart, rows were 18 inches apart, and beds were on 5-ft centers. Each plot was 30 ft long by 10 ft (four rows) wide. There were 20-ft bare alleys between blocks. Six treatments each with four replicates were set up in a randomized complete block design. Spinosad (Spintor 2SC) treatments were two rates (0.067 and 0.089 lb AI/ A) alone and the lower rate with two adjuvants: Coax at 2% of volume, and R-11 at 0.025% of volume. The standard insecticide treatment was acephate (Orthene 75 SP) at 1.0 lb AI/ A. The untreated check treatment was not treated with any insecticides. Insecticide treatments were initiated once second generation moths of ECB began emerging, as detected by a blacklight trap that was emptied six days per week. Sustained moth emergence started on 24 July and peaked on 10 August. Insecticide treatments at weekly intervals were applied 7 times: 31 July; 7, 14, 23, 29 August; and 5 and 18 September. Sprays were applied with a tractor-mounted boom sprayer that delivered 49 gallons per acre using 60 psi pressure, TX-18 hollow cone nozzles spaced 15 inches apart, and speed of 3 mi/hr. The first spray of spinosad (31 July) was applied at 10 times the intended rate in all treatments due to a calculation error. All four spinosad treatments were treated with imidacloprid (Provado 1.6F, 3 oz/ A) for aphid control on 2 September. Damage by ECB was evaluated at harvests on 16 September, 3 October, and 16 October. All fully ripe red pepper fruit that were firm enough to pick were cut from a flagged 10-ft section (ca. 7 plants) in the center two rows per plot; fruit were counted, weighed, and cut open to evaluate infestation by ECB. Data were subjected to analysis of variance followed by mean separations by least significant difference tests. Percentage data were transformed by arcsine square root before analysis. Data were analyzed for three individual harvests, and were pooled for analysis of cumulative harvests.

There was a significant effect of treatment on yield in the second harvest and in the cumulative harvests ($P < 0.0001$), with lower yield in the untreated check than in any of the five insecticide treatments. There was not a significant effect of treatment on yield in the first and third individual harvests ($P > 0.05$). There was a significant effect of treatment on the percentage of peppers clean of insect damage in all three harvests and in the cumulative harvest ($P < 0.0002$); all insecticide treatments were significantly cleaner than the untreated check. In the cumulative harvest, acephate was significantly cleaner than any of the spinosad treatments, and the two spinosad treatments with adjuvants were significantly cleaner than the two spinosad treatments without adjuvants. In all harvests, insect damage was due primarily to European corn borer; the percentage of larvae found that were ECB was 97% in first harvest, 92% in second harvest, and 96% in the third harvest. The remaining larvae were fall armyworm and an unidentified green tortricid.

TREATMENT	YIELD (KG)	YIELD (NO. FRUIT)	% CLEAN OF INSECT DAMAGE
FIRST HARVEST, 16 September 1997			
untreated check	2.8688	11.1	38.8 a
Spintor 2SC 0.067 lb AI/ A, alone	2.7875	10.8	87.1 b
Spintor 2SC 0.089 lb AI/ A, alone	3.2875	12.2	94.2 bc
Spintor 2SC 0.067 lb AI/ A + Coax 2%	3.8375	15.5	89.1 b
Spintor 2SC 0.067 lb AI/ A + R-11 0.025%	3.1938	12.2	91.4 bc
standard (Orthene 75SP 1 lb AI/ A, alone)	3.7000	13.8	100.0 c
<i>ANOVA P value</i>	0.93	0.91	<0.0001 *
SECOND HARVEST, 3 October 1997			
untreated check	3.1688 a	12.2 a	63.8 a
Spintor 2SC 0.067 lb AI/ A, alone	7.0750 b	27.2 b	95.5 b
Spintor 2SC 0.089 lb AI/ A, alone	7.1125 b	27.5 b	96.4 b
Spintor 2SC 0.067 lb AI/ A + Coax 2%	6.2750 b	24.5 b	98.9 b
Spintor 2SC 0.067 lb AI/ A + R-11 0.025%	7.0563 b	27.2 b	97.7 b
standard (Orthene 75SP 1 lb AI/ A, alone)	6.2688 b	24.2 b	100.0 b
<i>ANOVA P value</i>	0.0006 *	0.0016 *	0.0002 *
THIRD HARVEST, 16 October 1997			
untreated check	2.4875	11.2	58.9 a
Spintor 2SC 0.067 lb AI/ A, alone	5.4625	23.0	94.2 bc
Spintor 2SC 0.089 lb AI/ A, alone	4.3313	16.5	89.3 b
Spintor 2SC 0.067 lb AI/ A + Coax 2%	3.7750	15.8	97.5 bc
Spintor 2SC 0.067 lb AI/ A + R-11 0.025%	4.9563	20.0	95.9 bc
standard (Orthene 75SP 1 lb AI/ A, alone)	4.8312	19.5	100.0 c
<i>ANOVA P value</i>	0.07	0.10	0.0002 *
CUMULATIVE HARVESTS			
untreated check	8.5250 a	34.8 a	51.7 a
Spintor 2SC 0.067 lb AI/ A, alone	15.3250 b	61.0 b	93.5 b
Spintor 2SC 0.089 lb AI/ A, alone	14.7312 b	56.2 b	93.2 b
Spintor 2SC 0.067 lb AI/ A + Coax 2%	13.8875 b	55.8 b	95.8 c
Spintor 2SC 0.067 lb AI/ A + R-11 0.025%	15.2063 b	59.5 b	95.6 c
standard (Orthene 75SP 1 lb AI/ A, alone)	14.8000 b	57.5 b	100.0 d
<i>ANOVA P value</i>	<0.0001 *	<0.0001 *	<0.0001 *