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Section E: Vegetable Crops

SNAP BEAN: *Phaseolus vulgaris* L., 'Huntington'

European Corn Borer Control in Snap Bean, 2015

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Bean (snap) | *Phaseolus vulgaris*

European corn borer: *Ostrinia nubilalis* (Hübner)

European corn borer control (ECB) using foliar-applied insecticides was evaluated in a research snap bean field near Geneva, New York (GPS coordinates: 42.865500, -77.029667). On 25 June 2015, processing snap bean seeds were planted at a density of 23 seeds per m using a precision vacuum planter (Monosem Inc.). All seeds (including the non-insecticide control) were treated with thiamethoxam (Cruiser 5FS) and mefenoxam and fludioxonil (ApronMaxx) to protect seedlings against seed corn maggot, early infestations of potato leafhoppers and diseases. Natural ECB pressure in the research field is rarely high enough to sufficiently evaluate insecticide treatments on snap bean. To increase ECB pressure at the typical time ECB infests snap bean, plots were infested with neonates during late bloom to early pin stage. In one row of each plot that had the most uniform plant stand, a 3.0-m section was infested by hand with approximately 1,700 neonates on 7–9 Aug 2015. ECB were obtained from French Agricultural Research, Inc., Lamberton, MN.

Treatments were arranged in a RCB with five replications. Plots consisted of two rows 3.0 m long with rows spaced 76 cm apart. Treatments were applied at 19.8 gpa and 40 psi using a CO_2-pressurized backpack sprayer equipped with four, twin flat-fan nozzles (TJ 8002VS). Plots were sprayed on 6 Aug 2015, approximately one day before pod formation. Environmental conditions were typical at planting, although planting occurred later in the season than usual due to rain throughout early to mid-June. Temperatures during the study were relatively normal, with lower rainfall than average. All plants within the infested portion of each plot were sampled on 25–27 Aug and inspected for ECB larvae and their damage. The number of snap bean plants and market-sized pods infested/damaged and not infested/damaged by ECB larvae were recorded from each plot. Additionally, all market-sized pods from the plants not damaged by ECB were weighed. Data were analyzed using a generalized linear mixed model in SAS (PROC GLIMMIX), specifying a binomial distribution for damage data (damaged plants/total plants and damaged pods/total pods) and a normal distribution for weight of the undamaged pods. Replicate was treated as a random effect. Treatments were compared using least-squared means at $P < 0.05$.

The ECB infestation and resulting damage in this trial was considered high based on the level in the untreated control (Table 1). The lowest percentages of ECB-damaged plants and marketable pods were observed in plots treated with Belt SC, Coragen, Exirel, Besiege, and Brigade 2EC (Table 1). No differences existed among these best-performing treatments. Radiant SC-treated plants and pods had higher damage than the best performing treatments, but less damage than the Intrepid 2F treatment. Intrepid 2F-treated plants and pods had less damage than the untreated control, but still incurred high levels of damage. Weights of marketable beans did not differ significantly among treatments (Table 1). This research was partially supported by industry gifts including products and research funding.

Table 1

Product/formulation	Rate (fl oz/acre)	*n* plant	% damaged plants[a]	*n* pod	% damaged pods[a]	Yield (lb)[a]
Check	–	208	73.01 ± 7.39a	1439	15.13 ± 3.38a	3.50 ± 0.81a
Belt SC + Induce	2.0 + 0.125% v:v	229	0.00 ± 0.00d	1353	0.00 ± 0.00d	3.65 ± 0.81a
Coragen + Induce	3.5 + 0.125% v:v	204	0.00 ± 0.00d	1513	0.19 ± 0.12d	4.57 ± 0.64a
Exirel + Induce	13.5 + 0.125% v:v	248	1.27 ± 0.87d	1745	0.05 ± 0.05d	5.16 ± 0.45a
Besiege + Induce	6.0 + 0.125% v:v	266	0.32 ± 0.32d	1912	0.15 ± 0.15d	5.42 ± 0.50a
Brigade 2EC	3.0	279	0.68 ± 0.68d	1701	0.11 ± 0.11d	4.82 ± 0.53a
Radiant SC + Induce	7.2 + 0. 5% v:v	284	5.55 ± 2.89c	1817	1.11 ± 0.67c	5.48 ± 0.96a
Intrepid 2F	6.0	253	34.29 ± 7.77b	1346	5.55 ± 1.32b	3.70 ± 0.86a
$F(7,28)$			41.17		42.75	1.73
P			0.00		0.00	0.14

[a]Treatment means followed by the same letter are not significantly different ($P < 0.5$, least squared means).