

Influence of Nematicide Treatment and Pre-Plant Insecticide Treatment on Sweet Potato Yield and Root Injury

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Methods: Plots were planted to the sweet potato variety Beauregard, on a Commerce silt loam soil on 17 Jun. Plot size was four rows (40 inch centers) by 20 feet. Treatments were replicated four times in a randomized complete block design. Fall Telone II treatments (3 gal/acre) were applied on 17 Nov, 2004 and spring Telone II treatments (3 gal/acre) were applied on 27 May, 2005 with a coulter applicator at ca. 12 inches below the soil surface. Pre-plant insecticide treatments were applied with a tractor mounted boom and CO₂ charged spray system calibrated to deliver 10 gpa through Teejet 80015 flat fan nozzles (2/row) on 15 Jun, 2005. Pre-plant insecticide treatments were immediately incorporated with a row conditioner and the rows reformed. One center row of each plot was harvested on 12 Oct, 2005. The yield from each plot was partitioned into grades, # 1's, canners, and jumbos, and the weights for each grade were recorded. A random selection of #1's from each plot was examined for damage from soil insects on 27 Oct, 2005.

Comments: There were no significant interactions observed between nematicide treatment and pre-plant insecticide treatment for # 1's, canners marketable yield, early season root damage, or late season root damage. Plots treated with Telone (fall) and Lorsban, Telone (spring) and Baythroid, Telone (spring) and Capture, Telone (spring) and Lorsban, Telone (fall & spring) and Capture, or Telone (fall & spring) and no pre-plant insecticide had significantly less mid season root damage compared to plots that received Telone (fall) and Baythroid, Telone (fall) and Capture, Telone (fall) and no pre-plant insecticide, no Telone and Baythroid, no Telone and Lorsban, or no Telone and no pre-plant insecticide. Plots that received Telone (fall) and Lorsban, Telone (spring) and Baythroid, Telone (spring) and Capture, Telone (spring) and Lorsban, Telone (fall & spring) and Baythroid, Telone (fall & spring) and Capture, or Telone (fall & spring) and Lorsban had significantly less total root damage compared to plots that received Telone (fall) and Baythroid, Telone (fall) and Capture, Telone (fall) and no pre-plant insecticide, no Telone and Baythroid, no Telone and Lorsban, or no Telone and no pre plant insecticide. There were no significant differences among nematicide treatments for # 1's, canners marketable yield, early season root damage, or late season root damage. However, there was a strong trend for the fall treatments to yield better when we looked at total yield (significant at 0.01 and not shown). There was a similar trend for the influence of nematicide treatment on marketable yield (table 3). More tests will be conducted to further evaluate fall treatments. Plots that received Telone (spring or fall & spring) had significantly less mid season and total root damage compared to plots that received Telone (fall) or the non-treated plots. There were no significant differences among pre-plant insecticide treatments for # 1's, canners marketable yield, early season root damage, mid season root damage, late season root damage, or total root damage.

Table 1. Influence of nematicide treatment and pre-plant insecticides on sweet potato yield.

Telone II Treatment	Insecticide Treatment	Rate/acre lb/AI	# 1's bu/acre	Canners bu/acre	Marketable Yield
					bu/acre
Fall	Baythroid 2E	0.3	184.7	198.1	382.9
	Capture 2EC	0.3	184.1	211.2	395.3
	Lorsban 4EC	2.0	212.9	185.4	398.3
	Non-Treated	-	171.4	234.1	405.4
Spring	Baythroid 2E	0.3	134.8	185.7	320.5
	Capture 2EC	0.3	165.1	180.3	345.4
	Lorsban 4EC	2.0	144.9	204.1	349.0
	Non-Treated	-	139.6	221.3	360.9
Fall and Spring	Baythroid 2E	0.3	167.8	167.5	335.3
	Capture 2EC	0.3	138.4	180.0	318.5
	Lorsban 4EC	2.0	156.8	165.4	322.2
	Non-Treated	-	177.3	182.4	359.6
Non-Treated	Baythroid 2E	0.3	138.7	137.3	276.0
	Capture 2EC	0.3	119.1	136.4	255.4
	Lorsban 4EC	2.0	135.7	150.3	286.0
	Non-Treated	-	130.7	120.0	250.7
<i>P>F</i>			0.98	0.91	0.99

Means within columns followed by a common letter are not significantly different (FPLSD, P=0.05).

Table 2. Influence of nematicide treatment and pre-plant insecticides on root injury from soil insects.

Telone II Treatment	Insecticide Treatment	Rate/acre lb/AI	Damage/10 Roots			Total
			Early Season	Mid Season	Late Season	
Fall	Baythroid 2E	0.3	7.5	34.0abcd	0.7	42.2bcde
	Capture 2EC	0.3	21.2	35.3abcd	0.2	56.7ab
	Lorsban 4EC	2.0	7.0	11.0ef	0.0	18.0ef
	Non-Treated	-	6.7	38.5abc	0.2	45.5abcd
Spring	Baythroid 2E	0.3	4.7	11.8ef	0.0	16.5f
	Capture 2EC	0.3	7.0	3.3f	0.0	10.2f
	Lorsban 4EC	2.0	8.5	11.3ef	0.0	19.7ef
	Non-Treated	-	6.5	25.3bcde	1.0	32.7bcdef
Fall and Spring	Baythroid 2E	0.3	9.5	16.5def	0.2	26.2cdef
	Capture 2EC	0.3	6.0	11.8ef	0.0	17.7f
	Lorsban 4EC	2.0	4.7	15.3def	0.0	20.0ef
	Non-Treated	-	5.2	4.8ef	0.7	10.7f
Non-Treated	Baythroid 2E	0.3	12.5	53.8a	1.5	67.7a
	Capture 2EC	0.3	9.5	17.3def	0.5	27.2def
	Lorsban 4EC	2.0	18.2	44.3ab	1.0	63.5a
	Non-Treated	-	15.2	36.2abcd	1.7	53.0bc
<i>P>F</i>			0.10	0.03	0.96	0.01

Means within columns followed by a common letter are not significantly different (FPLSD, P=0.05).

Table 3. Influence of nematicide treatment on sweet potato yield.

Telone II Treatment	# 1's bu/acre	Canners bu/acre	Marketable Yield bu/acre
Fall	188.3	207.2	395.5
Spring	146.1	197.8	344.0
Fall and Spring	160.1	173.8	333.9
Non-Treated	131.0	136.0	267.0
<i>P>F</i>		0.39	0.19
			0.17

Means within columns followed by a common letter are not significantly different (FPLSD, P=0.05).

Table 4. Influence of nematicide treatment on root injury from soil insects.

Telone II Treatment	Damage/10 Roots			Total
	Early Season	Mid Season	Late Season	
Fall	10.6	29.7a	0.3	40.6a
Spring	6.7	12.9b	0.2	19.7b
Fall and Spring	6.3	12.1b	0.2	18.7b
Non-Treated	13.8	37.9a	1.2	52.9a
<i>P>F</i>		0.13	<0.01	0.15
			<0.01	

Means within columns followed by a common letter are not significantly different (FPLSD, P=0.05).

Table 5. Influence of pre-plant insecticides on sweet potato yield.

Insecticide Treatment	Rate/acre lb/AI	# 1's bu/acre	Canners bu/acre	Marketable Yield bu/acre
Baythroid 2E	0.3	156.5	172.1	328.6
Capture 2EC	0.3	151.7	177.0	328.7
Lorsban 4EC	2.0	162.6	176.3	338.9
Non-Treated	-	154.7	189.4	344.2
<i>P>F</i>		0.97	0.77	0.93

Means within columns followed by a common letter are not significantly different (FPLSD, P=0.05).

Table 6. Influence of pre-plant insecticides on root injury from soil insects.

Insecticide Treatment	Rate/acre lb/AI	Damage/10 Roots				Total
		Early Season	Mid Season	Late Season		
Baythroid 2E	0.3	8.5	29.0	0.6	38.2	
Capture 2EC	0.3	10.9	16.9	0.2	28.0	
Lorsban 4EC	2.0	9.6	20.4	0.2	30.3	
Non-Treated	-	8.4	26.2	0.9	35.5	
<i>P>F</i>		0.73	0.10	0.24	0.34	

Means within columns followed by a common letter are not significantly different (FPLSD, P=0.05).