

PRE-PLANT INSECTICIDES FOR INSECT PEST MANAGEMENT IN WHITE POTATOES, 2008

Ghidiu, G. M. and G. Rogers

Rutgers New Jersey Agricultural Experiment Station Cooperative Extension
Rutgers Agricultural Research and Extension Center
Bridgeton, NJ 08302

POTATO (White)

'Superior' cv. white potatoes were planted in the late afternoon on 18 Apr into a sandy loam field at Dusty Lane Farms (Mr. William Brooks, owner), Elmer, NJ, 08318. Plots consisted of 3 rows of potatoes, each row 25-ft long and 3-ft wide, replicated four times in a randomized complete block design, with a 5-ft break between replicates. In-furrow treatments of Admire 2F (7 and 8.7 fl oz/a), Platinum 2SC (8 fl oz/a), or HGW 2SC (E.I. DuPont deNemours, Co.) were applied in the furrow in front of the seed piece using a hand-held 2-gal Agway water sprinkler can calibrated to deliver 50 gal/acre in a 4-inch band at planting (19 Apr). For the seed piece treatment, seed pieces were spread out in a single layer on a 5 ft X 5ft plastic sheet, and a single seed-applied treatment (HGW 60FS) was sprayed onto the seed pieces just before planting with a hand-held wand sprayer at a rate of 0.004 g AI/seed piece in 4 oz water per 66 pieces at 30 psi. Seed was rotated as it was being sprayed to ensure complete coverage, then air dried for 60 minutes before seeding. All rows were covered with soil at 7 a.m. on 20 Apr (an equipment breakdown caused a delay between seeding and covering seed pieces). No further insecticide treatments were applied. Numbers of CPB egg masses and adults per 3 hills were recorded on 2, 6, 10 Jun, and small and/or large larvae (small = 1st and 2nd instars, large = 3rd and 4th instars) per 3 hills were recorded on 6, 10, 13, 19, 25 Jun, 2, 11, 18 and 23 Jul. Percentage plant defoliation was recorded on 10, 25 Jun and 11 Jul, and all plots were rated for potato leafhopper damage on 2, 11, 18 and 23 Jul with a rating of 0 to 5 where 0= no damage, 1= light damage (leaves off-color, some curling), 5= severe damage, leaves dead. All data were recorded from the center row. Plots were not harvested for yields.

All treatments resulted in significantly fewer numbers of Colorado potato beetle adults on 2 Jun. and significantly few numbers of egg masses on 2 and 6 Jun, as compared with the untreated. All treatments had significantly fewer small CPB larvae (1st and 2nd instars) on 6, 10, 13, 19 Jun and 11 Jul, and significantly fewer large CPB (3rd and 4th instars) on 10, 13, 19 Jun and 18 Jul, as compared with the untreated. All treatments had significantly fewer total CPB larvae on 10, 13, 19 Jun and 11 Jul as compared with the untreated. All treatments resulted in significantly less percentage plant defoliation on all dates recorded as compared with the untreated. Also, all treatments resulted in significantly less potato leafhopper damage (0-5 rating scale) on 2 Jul, and all Admire and Platinum treatments had significantly less potato leafhopper damage on all dates recorded, as compared with the untreated. No phytotoxicity was observed

Table 1. Effect of treatments on CPB adults and egg masses on potatoes, Elmer, NJ. 2008.

Treatment ²	Rate oz/a	No. CPB /3 hills ¹					
		Adults			Egg masses		
		2 Jun	6 Jun	10 Jun	2 Jun	6 Jun	10 Jun
Admire 2FS AP	7.0	0.8 a	3.5 ns	0.3 ns	0.0 a	2.0 a	0.8 ns
Admire 2FS AP	8.7	0.5 a	3.5	0.3	0.3 a	1.5 a	1.3
Platinum 2SC AP	8.0	0.5 a	5.8	0.3	0.3 a	1.5 a	1.0
HGW 20SC AP	0.004 ³	0.5 a	4.0	0.8	0.0 a	3.5 a	3.3
HGW 60FS ST	0.176 ⁴	0.3 a	3.3	0.3	0.8 a	1.3 a	1.0
Untreated	-----	5.0 b	6.0	0.0	8.0 b	10.3 b	3.8

Numbers in a column with a letter in common are not significantly different (Tukey's HSD 0.05)

¹ CPB= Colorado potato beetle

² AP-IF = at plant, in-furrow treatment on 18 Apr, covered 20 Apr; ST = seed treatment

³ grams AI/seed piece

⁴ lb AI/acre

Table 2. Effect of treatments on small CPB larvae on potatoes, Elmer, NJ. 2008.

Treatment ¹	Rate oz/a	Small CPB larvae/3 hills ²						
		6 Jun	10 Jun	13 Jun	19 Jun	25 Jun	2 Jul	11 Jul
	7.0							
Admire 2FS AP	8.7	0.0 a	4.3 a	2.5 a	1.3 a	3.8 a	1.3 ns	2.8 a
Admire 2FS AP	8.0	0.0 a	0.0 a	0.0 a	0.0 a	1.0 a	0.3	0.8 a
Platinum 2SC AP	0.004 ³	0.0 a	0.0 a	0.0 a	0.0 a	0.0 a	0.0	1.0 a
HGW 20SC AP	0.176 ⁴	0.0 a	6.8 a	10.3 a	2.3 a	9.3 b	1.5	5.0 a
HGW 60FS ST	-----	0.0 a	0.0 a	0.0 a	0.3 a	1.3 a	0.0	0.0 a
Untreated	-	10.8 b	48.3 b	28.5 b	9.8 b	2.0 a	1.8	10.8 b

Numbers in a column with a letter in common are not significantly different (Tukey's HSD 0.05)

¹ AP-IF = at plant, in-furrow treatment on 18 Apr, covered 20 Apr; ST = seed treatment

² small larvae = 1st and 2nd instar CPB

³ grams AI/seed piece

⁴ lb AI/acre

Table 3. Effect of treatments on large CPB larvae on potatoes, Elmer, NJ. 2008.

Treatment ¹	Rate oz/a	Large CPB larvae/3 hills ²							
		10 Jun	13 Jun	19 Jun	25 Jun	2 Jul	11 Jul	18 Jul	23 Jul
Admire 2FS AP	7.0	0.0 a	0.0 a	1.0 a	3.0 a	5.3 b	0.3 ns	9.0 a	4.5 ab
Admire 2FS AP	8.7	0.0 a	0.0 a	1.0 a	0.8 a	0.8 a	1.0	0.3 a	2.3 a
Platinum 2SC AP	8.0	0.0 a	0.0 a	0.0 a	0.0 a	0.0 a	0.3	2.3 a	2.5 a
HGW 20SC AP	0.004 ³	0.0 a	0.0 a	4.0 a	2.8 a	2.5 ab	0.5	10.3 a	14.3 c
HGW 60FS ST	0.176 ⁴	0.0 a	0.0 a	0.0 a	0.5 a	0.0 a	0.0	6.0 a	0.5 a
Untreated	-----	2.8 b	38.8 b	20.8 b	13.5 b	6.5 b	1.8	30.5 b	13.3 c

Numbers in a column with a letter in common are not significantly different (Tukey's HSD 0.05)

¹ AP-IF = at plant, in-furrow treatment on 18 Apr, covered 20 Apr; ST = seed treatment

² large larvae = 3rd and 4th instar CPB

³ grams AI/seed piece

⁴ lb AI/acre

Table 4. Effect of treatments on total CPB in white potato, Elmer, NJ. 2008.

Treatment ²	Rate oz/a	Total no. CPB /3 hills ¹					
		10 Jun	13 Jun	19 Jun	25 Jun	2 Jul	11 Jul
Admire 2FS AP	7.0	4.3 a	2.5 a	2.3 a	6.8 a	6.5 bc	3.5 a
Admire 2FS AP	8.7	0.0 a	0.0 a	1.0 a	1.8 a	1.0 ab	1.8 a
Platinum 2SC AP	8.0	0.0 a	0.0 a	0.0 a	0.0 a	0.0 a	1.3 a
HGW 20SC AP	0.004 ³	6.8 a	10.3 a	6.3 a	12.0 a	4.0 abc	5.5 a
HGW 60FS ST	0.176 ⁴	0.0 a	0.0 a	0.3 a	1.8 a	0.0 a	0.0 a
Untreated	-----	51.0 a	67.3 b	30.5 b	15.5 b	8.3 c	33.5 b

Numbers in a column with a letter in common are not significantly different (Tukey's HSD 0.05)

¹ total larvae = 1st, 2nd, 3rd and 4th instar CPB

² AP-IF = at plant, in-furrow treatment on 18 Apr, covered 20 Apr; ST = seed treatment

³ grams AI/seed piece

⁴ lb AI/acre

Table 5. Effect of treatments on potato leafhopper damage ratings, Elmer, NJ. 2008.

Treatment ¹	Rate oz/a	Potato Leafhopper Damage Rating (0-5)			
		2 Jul	11 Jul	18 Jul	23 Jul
Admire 2FS AP	7.0	0.7 ab	1.4 ns	1.5 ab	2.1 b
Admire 2FS AP	8.7	0.7 ab	1.1	1.1 ab	1.1 a
Platinum 2SC AP	8.0	0.3 a	1.0	0.6 a	0.8 a
HGW 20SC AP	0.004 ³	0.8 ab	2.1	2.9 c	3.4 c
HGW 60FS ST	0.176 ⁴	0.8 ab	2.2	2.7 bc	3.2 c
Untreated	-----	1.1 b	2.2	3.3 c	3.6 c

Numbers in a column with a letter in common are not significantly different (Tukey's HSD 0.05)

¹ AP-IF = at plant, in-furrow treatment on 18 Apr, covered 20 Apr; ST = seed treatment

² small larvae = 1st and 2nd instar CPB

³ grams AI/seed piece

⁴ lb AI/acre

Table 6. Effect of treatments on potato plant defoliation, Elmer, NJ. 2008.

Treatment ¹	Rate oz/a	% defoliation		
		10 Jun	25 Jun	11 Jul
Admire 2FS AP	7.0	3.3 a	5.3 a	6.5 a
Admire 2FS AP	8.7	1.5 a	2.8 a	3.3 a
Platinum 2SC AP	8.0	2.5 a	2.0 a	3.5 a
HGW 20SC AP	0.004 ³	4.0 a	7.3 a	5.9 a
HGW 60FS ST	0.176 ⁴	1.8 a	3.0 a	2.3 a
Untreated	-----	13.5 b	21.3 a	21.0

Numbers in a column with a letter in common are not significantly different (Tukey's HSD 0.05)

¹ AP-IF = at plant, in-furrow treatment on 18 Apr, covered 20 Apr; ST = seed treatment