



## Summary of insecticide efficacy for control of wireworms on potatoes – Virginia (2003-2015)

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Wireworms are the subterranean larval stage of click beetles. These insects can remain in the soil for several years attacking potato seed pieces or tubers or seeds and roots of other crops that are planted in the field. Wireworms can cause serious damage to potato crops by tunneling into tubers, which reduces yield quality and creates entry points for certain plant pathogens that can rot the tuber. Wireworms are attracted to high moisture; and densities are often higher in low-lying portions of fields. Moreover, during extended hot, dry weather, wireworms may seek out the potato tubers for moisture in addition to food; exasperating the damage. It has been well documented that wireworm damage to potato tubers increases the longer tubers are left in the ground.

Chemical control of wireworms can be challenging because these insects can remain in the soil for many years moving up and down the soil profile as the season progresses. Sometimes the wireworms do not come in contact with the chemicals while they are active in the soil. Organophosphates and carbamates have historically provided significant control of wireworms in potatoes, but labeling restrictions have led to the loss of registrations of many of these insecticides. As of 2014, Mocap EC or 15G and Thimet 20G (in a LocknLoad) granular formulation remain the only organophosphates available for at-planting or pre-planting use on potatoes. Other insecticide options for controlling wireworms include Regent, neonicotinoids, and the pyrethroid bifenthrin (Capture LFR, Bifenture, or Sniper). Additional insecticides that have shown activity against wireworms include the diamide Verimark applied in furrow, Seduce wireworm bait, which is an organic product containing the insecticide spinosad, and foliar applications of Movento. Movento, is a two-way systemic insecticide that, when applied at flowering to potatoes, has been shown to reduce wireworm damage to tubers in trials in the Pacific Northwest. More often than not, growers will also be applying another insecticide at planting.

### A summary of insecticide efficacy trial results from 2003 to 2015 from Virginia are presented below.

- Insecticide efficacy trials were conducted at the Virginia Tech ESAREC in Painter, VA or other on-farm locations in VA.
- Potatoes were planted in March or April; variety = Superior, Atlantic, or Kennebec.
- All experiments were arranged as a Randomized Complete Block with 4 replicates.

- Individual plot sizes = 1 or 2 rows x 20ft
- It is difficult to obtain statistically significant data on wireworm damage in a given trial because of the patchiness and variable of the data. We summarized average trends over multiple trials and years to provide a better idea of insecticide efficacy.

## Results

- A number of insecticide treatments can reduce wireworm injury by 50% or more (Table 1).
- The most effective treatments, which averaged from 63 to 80% control, included: Thimet 20G granules; or mixtures of two different insecticides, such as Capture LFR + Admire Pro, Regent + Admire Pro, or Regent + Platinum.
- The newer insecticides including: Verimark applied in-furrow; Movento applied as a foliar spray; and the organic product Seduce wireworm granules were less effective than other treatments. It should be noted that the Movento foliar treatment would most likely not be used as a stand-alone, but rather to supplement control from at-planting treatments.

**Table 1. Summary of % control (= reduction in % wireworm damaged potato tubers) from insecticide efficacy trials conducted in Virginia from 2003 to 2015.**

<i><b>Insecticide treatment (in-furrow at-planting applications per acre unless otherwise noted)</b></i>	<i><b>Number of trials included</b></i>	<i><b>Average % control</b></i>	<i><b>Min</b></i>	<i><b>Max</b></i>
Capture LFR (25.5 fl. oz) + Admire Pro (5.22 fl. oz PE)	3	79.9	69.6	90.0
Thimet 20G (11.3 oz/1000 ft of row)	3	78.3	75.9	82.7
Admire Pro (8.7 fl. oz) + Regent 4SC (3.2 fl. oz)	5	68.0	51.7	78.9
Platinum 75SG (2.7 oz) + Regent 4SC (3.2 fl. oz)	3	63.2	44.8	73.4
Mocap 6EC (4 qts banded)	7	59.7	16.7	86.4
Admire Pro (8.7 fl. oz)	15	57.0	20.7	89.1
Brigadier 2SC (25.6 fl. oz)	12	56.4	46.2	72.7
Platinum 75SG (2.7 oz) or Platinum 2SC (8 fl oz)	12	56.3	20.0	86.2
Regent 4SC (3.2 fl. oz)	16	50.4	12.5	92.6
Sniper 2EC (19.2 fl. oz) or Capture LFR (25.5 fl oz)	6	43.0	0.0	76.6
Verimark (13.5 fl. oz)	7	38.2	1.4	87.5
Movento + NIS (5 fl. oz foliar applications at flowering)	5	24.6	0.0	44.6
Seduce wireworm bait – granules applied @ 22 lb/A	3	18.2	0.0	49.0