

EVALUATION OF DRIP IRRIGATION INSECTICIDE TREATMENTS FOR THE CONTROL OF LEPIDOPTERAN PESTS IN FALL STAKED TOMATOES - 2008

Tom Kuhar and Hélène Doughty

Eastern Shore Agricultural Research and Extension Center,
Virginia Tech, Painter, Virginia

Introduction

The tomato fruitworm, *helioverpa zea*, is one of the most important pests of tomatoes. Although thorough control of this pest can be achieved with many foliar insecticides, applications have to be made on a timely basis with repeated treatments. Insecticides of choice have been primarily pyrethroids (Warrior ZT, Mustang Max, Asana XL, Capture) as well as other broadspectrum insecticides (Baythroid, Lannate, Spintor). Applying these insecticides as foliar sprays often leads to secondary pest outbreaks due to the destruction of beneficial/predatory insects and undoubtedly increases the financial input for the crop. Two new insecticides, Coragen 20SC and Durivo have shown outstanding results for the control of lepidopteran pests when applied through the soil while reducing the inconveniences of usage aforementioned. The objective of this experiment was to evaluate the efficacy of these novel insecticides when applied through drip irrigation in fall staked tomatoes.

Experimental design & materials

The experiment was conducted at the Virginia Tech ESAREC, Painter, VA on 'Solar Fire' tomatoes. Tomatoes were transplanted on 17 Jul at the Virginia Tech ESAREC near Painter, VA. Plots consisted of 1 row 30 ft long on plastic bedding. Rows were planted on a 6 ft row center in a 4 tier field design with 5 ft alleys between tiers. A total of 9 treatments were arranged in a RCB design with four replicates. All plots were maintained according to local standard practices. All drip irrigation treatments were applied just before flowering with the use of chemilizers (HN55 Chemical injectors by Chemilizer Products, Inc.). Each insecticide amount was diluted in 150 ml of water, poured into the chemilizer feeding tube and flushed with an additional 300 ml of water. Irrigation events for approximately one hour always followed chemical application (irrigation was run at least 3 times weekly for a minimum of 1 hour for each event). Treatments were applied on 12 Aug and 22 Aug (except Coragen 20SC at 6.76 fl. oz / a). Soil temperature in the plastic beds averaged 79°F at the time of treatment.

Procedures

On 29 Aug (17 DAT), 20 small fruits (≤ 1 inch in diameter) were harvested and examined for lepidopteran damage. This was conducted on the premises that these fruit suffer a significant amount of damage if the pest is present but may rot and be aborted by the plant before final harvest. On 17 Sep, all fruit were harvested from each plot and weighed. A sub-sample of 30 fruit was examined for lepidopteran larvae and stink bug damage. On 18 Sep, 2 plants (vegetation and root ball) were extracted from the plastic bedding and weighed for each plot. All data were analyzed using ANOVA. Proportion data were arcsine square root transformed prior to analysis. Means were separated using Fisher's Protected LSD at the 0.05 level of significance.

Results

Lepidopteran pest pressure was heavy in this trial with about 47% of fruit injured primarily by tomato fruitworm. Tomato hornworm also contributed to some fruit damage. There was a significant treatment effect on % lepidopteran fruit damage. All treatments except Admire Pro had significantly less damage than the control. Among the Coragen treatments, two applications of 5 oz appeared to give a little better control than two applications of 3.38 oz or 1 application of 6.76 oz. Stink bug damage to fruit was low in this trial and not significant. There was a significant treatment effect on yield of tomato fruit with all treatments that included rynaxypyr (Coragen or Durivo) yielding more fruit than the untreated control and the Admire Pro alone treatment. No visible sign of phytotoxicity was observed from any treatment.

Table 1. Summary of efficacy of insecticides applied through drip irrigation for the control of lepidopteran pests in fall staked tomatoes; Painter, VA 2008

Treatment	Rate / acre in fl. oz	% small fruit damage	% lepidopteran larvae* damage	% stink bug damage	Yield wt of fruit per plot (in lbs)
Untreated Control		18.8 a	46.7 a	3.3	44.1 e
Coragen 20SC	3.38	0.0 b	8.3 b	1.7	90.7 ab
Coragen 20SC	5.08	1.3 b	1.7 b	1.7	71.5 cd
Coragen 20SC (1 application only)	6.76	0.0 b	5.0 b	3.3	103.6 a
Coragen 20SC + Platinum 2SC	5.08 + 5	0.0 b	3.3 b	0.0	90.7 ab
Coragen 20SC + Admire Pro	5.08 + 7	0.0 b	4.2 b	0.0	104.9 a
Admire Pro	7	15.0 a	36.7 a	1.7	57.3 de
Durivo	10.3	1.3 b	0.0 b	5.8	98.3 ab
Durivo	13	1.3 b	2.5 b	0.0	80.8 bc

*tomato fruitworm, tomato hornworm