

Soil Technologies Corp.
Research and Development Department



Research Report

Title: Efficacy of Natural Control Methods of Tomato Leafminer (*Tuta Absoluta*)

Location: Tunisia

Principal Investigators: Dr. Mohamed Braham, Regional Center for Research in Horticulture and Organic Agriculture of Chott-Meriem, Tunisia

Crop: Tomato (variety: Chourouk)

Date: 2009

Abstract:

The purpose of this trial was to evaluate the efficacy of various natural pesticides in the treatment of tomato leafminer, *Tuta absoluta* in greenhouse grown tomato plants. The following treatments were evaluated: Armorex¹, Konflic², Kaolin³, Tracer⁴, Ec-Neem⁵, Prevam⁶, Deffort⁷, and Temoin⁸. Three days after the application of each product, tomato plants were evaluated for the number of dead and alive larvae present on leaves. Armorex had the highest efficacy including the average percent death rate across all trials.

¹Armorex is a minimum risk pesticide manufactured by Soil Technologies Corp. in Fairfield, IA USA ²Konflic is a natural pesticide manufactured by Atlantica Agricultura Natural

³Kaolin is a mineral compound CAS # 1332-58-7

⁴Tracer is a group 5 insecticide EPA Reg. No. 62719-267

⁵Ec-Neem is a natural pesticide

⁶Prevam is a broad spectrum insecticide EPA Reg. No. 72662-3

⁷Deffort is a natural pesticide produced by Altinco Agro ⁸Temoin is a natural pesticide

Methods:

Tomato plants were planted November 23, 2009 in the Organic Greenhouse Sahline Monastery in a 550 m² area containing soil composed of 20% silt, 40% clay and 40% sand. The following treatments were evaluated at a dosage rate of 6 cc/L of water: Armorex¹, Konflic², Kaolin³, Tracer⁴, Ec Neem⁵, Prevam⁶, Deffort⁷, and Temoin⁸. Three days after the application of each product, tomato plants were evaluated for the number of dead and alive larvae present. Larvae stages that were tested in this trial (L1, L2-L3, and L4) are depicted in the photograph to the right.



L1



L2-L3

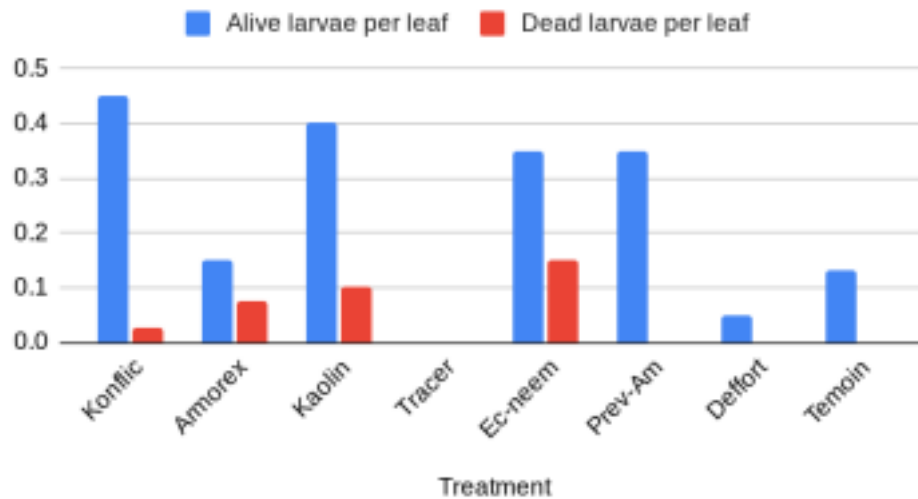


L4

Results:

The graphs below depict the effect of natural pesticides on larvae number, three days after treatment took place on March 29, 2010 and April 8, 2010.

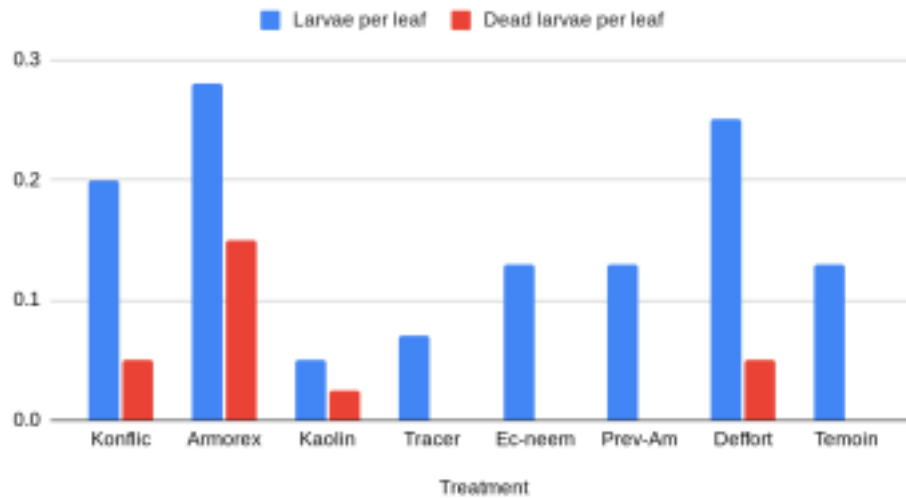
Number of L1, L2 and L3 Larvae 3/29/2010



Graph 1: Living and Dead Larva (L1, L2, L3) After First Application

The Graph 1 depicts the numbers of L1, L2, and L3 larvae (average number per leaf) counted three days after the application of treatments. Ec-neem had the highest death count while Amorex had the highest death rate.

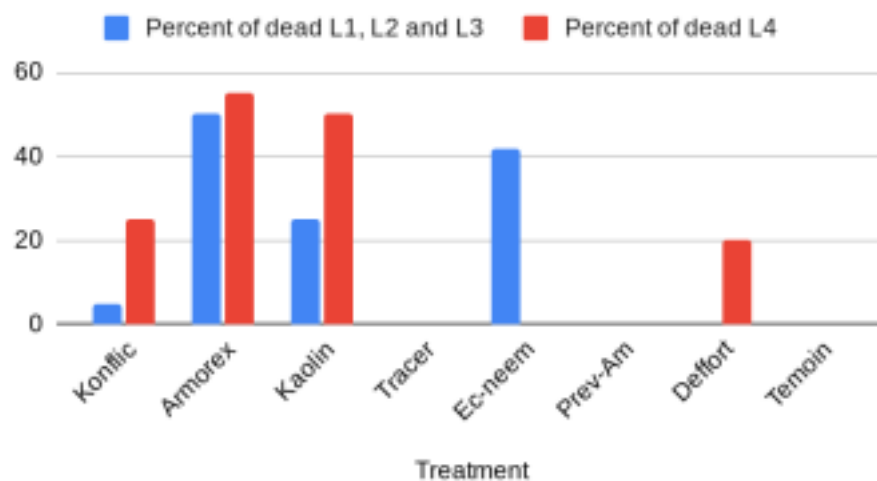
Number of L4 Larvae 3/29/2010



Graph 2: Living and Dead Larva (L4) After First Application

Graph 2 shows the average number of L4 larvae per leaf by treatment observed three days after application of treatments. Amorex had the highest death count and death rate.

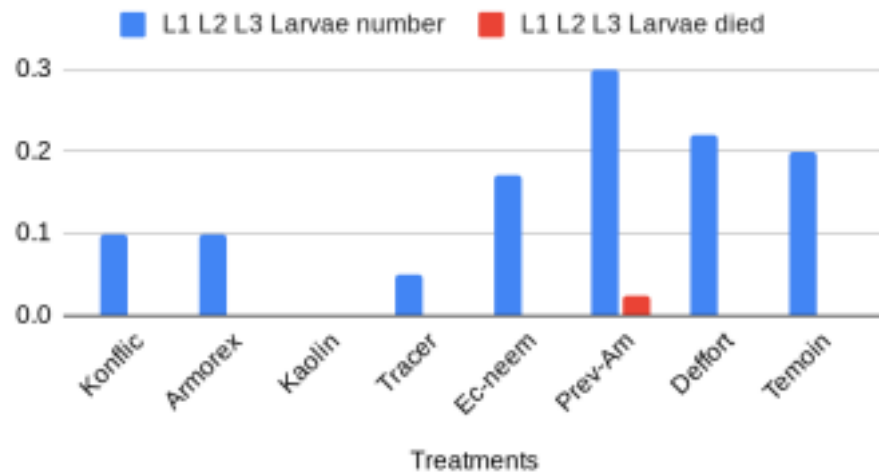
Percent of Dead Larvae 3/29/2010



Graph 3: Percent Death After First Application

Graph 3, above demonstrates the percent of dead larvae observed three days after treatment on March 29, 2010. Tomato plants treated with Amorex had the highest percent of dead larvae out of all treatments. Amorex treated plants resulted in a 50% death rate of L1, L2 and L3 larvae and a 55% death rate in L4 larvae. Kaolin provided the second highest death rate of 50% in L4 larvae.

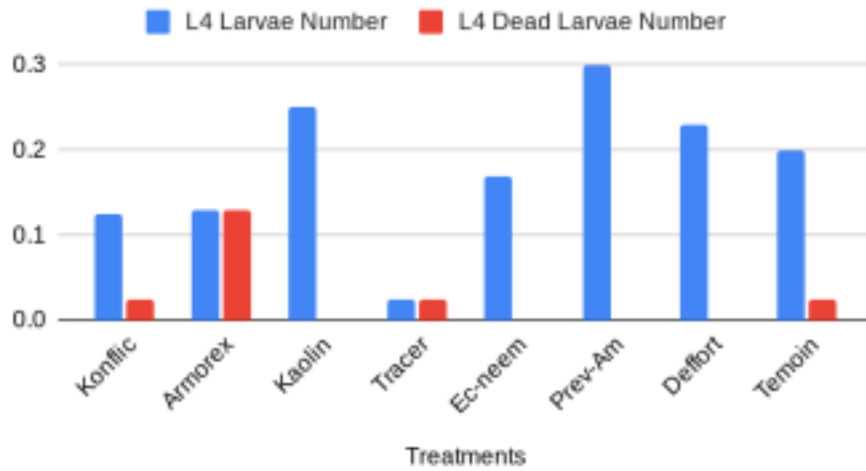
L1, L2 and L3 Larvae Number 4/8/2010



Graph 4: Living and Dead Larva (L1, L2, L3) After Second Application

The graph above demonstrates the number of L1, L2, and L3 larvae three days after the application of treatments on April 8, 2010. Prev-Am treated plants had the highest count of larvae followed by Delfort and Temoin. Prev-Am also had the highest count of dead larvae. Graph 5 shows the results for the number of L4 larvae per treatment three days after the application of treatments. Plants treated with Armorex had the highest number of dead L4 larvae and highest death rate.

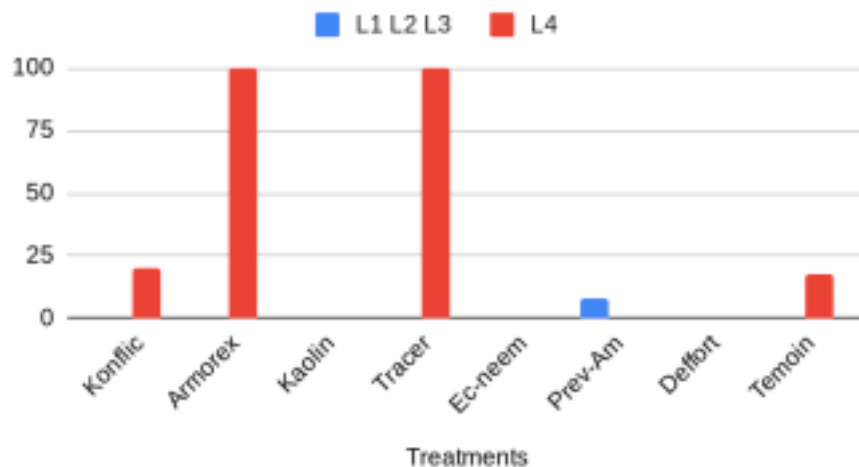
L4 Larvae Numbers 4/8/2010



Graph 5: Living and Dead Larva (L4) After First Application

The graph below represents the results in percent of dead larvae. Armorex performed the best by achieving a 100% death rate in L4 larvae with an average number of alive larvae of 0.13 per leaf. Tracer treated plants also obtained a 100% death rate but had a lesser infestation of L4 larvae of 0.025 larvae per leaf.

Percent of Dead Larvae 4/8/2010



Graph 6: Percent of Larva Death After Second Application

Chart 1 below, shows the percent death rates and an average across all trials.

	Percent Death by Treatment				
	3/29/2010 Results		4/28/2010 Results		Average
	L1, L2, L3	L4	L1, L2, L3	L4	
Konflic	5%	25%	0%	20%	13%
Armorex	50%	55%	0%	100%	51%
Kaolin	25%	50%	0%	0%	19%
Tracer	0%	0%	0%	100%	25%
Ec neem	42%	0%	0%	0%	11%
Prev-Am	0%	0%	8%	0%	2%
Deffort	0%	20%	0%	0%	5%
Temoin	0%	0%	0%	18%	5%

Chart 1: Larva Death Rate Percents

Conclusions:

In conclusion, the results from this study indicate that Armorex performed the best in controlling tomato leafminer larvae compared to the other treatments. Results taken from the first round of application indicate that Armorex treated plants had the highest mortality rates for all larvae stages and results from the second application of treatments show a 100% death rate for L4 larvae.