

## **Influence of transplant, transplant water and irrigation system injected treatments on viral disease incidence in processing tomato, Fresno County, 2018.**

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*Beet curly top virus* (BCTV) transmitted by Beet leafhopper, *Circulifer tenellus*, and *Tomato spotted wilt virus* (TSWV) transmitted primarily by Western flower thrips, *Frankliniella occidentalis* have inflicted economic losses on fresh market and processing tomato producers in Central California. In addition to other research efforts regarding management of these diseases, the potential utility of chemical treatments as a component of an IPM program is being investigated.

### **METHODS**

On 17 May, processing tomato plants were transplanted into a Panoche clay loam at University of California West Side Research and Extension Center in Fresno County, CA. Throughout the season, the field was irrigated with drip tubing (Netafim 15mm, 0.24 GPH emitter at 14" spacing) buried at a depth of 10 inches. Each plot consisted of one 60-inch bed, 120 feet long. The experimental design was a randomized complete block with four replications. Treatments compared are detailed in the tables below. Treated transplants were sprayed on 16 May with a CO<sub>2</sub>-powered sprayer equipped with a TeeJet TP8003VS. Each 198-plant tray was treated with 400 ml water at a concentration that resulted in the per acre rate based on the transplant density of 7467 plants per acre. Admire Pro was injected into the sub-surface drip system with generator-powered electric metering pumps (A-1600 FlexFlo® Peristaltic Pump Blue and White Industries, Huntington Beach, CA) on 1 Jun. The drip irrigation lines were plumbed specifically for that treatment equipped with an injection port and a back-flow valve. The material was mixed into 2.5 gallons and injected over 30 minutes. After the injection was completed, water was run through the system for 45 min before being turned off. The foliar applications were made on 3 Jun with a CO<sub>2</sub>-pressurized backpack sprayer at 32 psi and an directed spray of 30 gal/a. The sprayer boom was equipped with a TeeJet TP8004VS nozzle. On 28 Jun and 2 Aug, the number of diseased plants per plot were recorded and percent disease incidence is presented in the table below. Analysis of variance was performed and Student-Neuman-Kuel's Multiple Range Test at P = 0.05 was used for mean separation.

### **RESULTS/DISCUSSION**

Both *Beet curly top virus* (BCTV) and *Tomato spotted wilt virus* (TSWV) were present, but TSWV was present at very low levels. Verimark treated plants had lower levels of BCTV symptoms than the untreated control on both evaluation dates and the Admire-treated plants had lower levels on the second date evaluated. No phytotoxicity symptoms were observed.

The results from the 2018 studies, regarding BCTV incidence reduction, were consistent with studies conducted at this location in 2015 and 2016. The 2017 study for purposes of BCTV efficacy evaluations was compromised due to low disease levels at the experimental site. Incidence of BCTV was very low throughout the tomato production areas in Central California in 2017.

Treatment influence on *Beet curly top virus* and *Tomato spotted wilt virus* symptom incidence in Fresno County, CA 2018.

Material(s) and equivalent rate per acre <sup>y</sup>	Timing	BCTV incidence (%) <sup>z</sup>		TSWV incidence (%) <sup>z</sup>	
		28-Jun	2-Aug	28-Jun	2-Aug
Vermark 12.5 fl oz	Transplant drench <sup>x</sup>	1.8 b <sup>w</sup>	4.0 b	1.4	3.9
Admire pro 8 fl oz/acre	Drip applied 1 Jun <sup>v</sup>	3.7 ab	3.5 b	1.3	3.9
Sequoia 2.5 fl oz	Transplant drench	4.4 ab	6.0 ab	2.2	3.9
Sequoia 4.5 fl oz	Foliar 3 Jun <sup>u</sup>	4.7 ab	7.2 ab	0.9	5.0
Sequoia 2.5 fl oz + Radiant 6.0 fl oz	Foliar 3 Jun	5.3 ab	6.8 ab	1.9	3.6
Radiant 10.0 fl oz	Foliar 3 Jun	5.9 ab	7.1 ab	1.3	4.0
Sequoia 4.5 fl oz	Transplant drench	6.3 a	7.1 ab	1.8	2.7
Untreated control		7.8 a	8.7 a	1.7	4.0

<sup>z</sup> Number of plants expressing symptoms of either *Tomato spotted wilt virus* or *Beet curly top virus* were recorded on dates listed and are presented as a percentage of total plants in the plot based on stand counts on 3 Jun.

<sup>y</sup> Rates of materials applied are expressed as formulated rates per acre.

<sup>x</sup> Treated transplants were sprayed on 16 May. Concentrations were calculated based on volume per transplant and transplants per acre to deliver the equivalent rate per acre listed.

<sup>w</sup> Means appearing within a column that are followed by the same letter are not significantly different as determined by Student Neuman-Kuel's Multiple Range Test P=0.05.

<sup>v</sup> A generator-powered electric metering pump was used to inject the material over 30 minutes and the system was run for an additional 45 min before being turned off.

<sup>u</sup> Foliar applications were in the equivalent of 30 gallons of water per acre with a CO<sub>2</sub>-pressurized backpack sprayer at 32 psi.

