

New Products to Control Tomato Diseases

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Studies in 2004 and 2005 evaluated new products and industry standards for efficacy against bacterial canker, early and late blights of tomato (Table 1).

Table 1. Products used in tomato trials.

Product	Active ingredient	Labeled
Acrobat 50WP	dimethomorph	yes
Actigard 50WG	acibenzolar-S-methyl	no
Amistar 80WG	azoxystrobin	yes
Bravo Weather Stik 6SC, Bravo Ultrex 82.5WDG.....	chlorothalonil	yes
Cabrio 20WG	pyraclostrobin	yes
Champ 57.6DF, Kocide 2000 54DF, Kocide 61.4DF	copper hydroxide	yes
Dithane 75DF, Manzate 75DF	mancozeb	yes
Endorse 11.3 DF.....	polyoxin D zinc salt	no
Ranman 3.3SC	cyazofamid	yes
Ridomil Gold Bravo 76.5WP.....	mefenoxam + chlorothalonil	yes
Serenade Max 20WP	<i>Bacillus subtilis</i>	no
Tanos 50WG	famoxadone + cyazofamid	yes
BAS 55007F 4.17SC, CTL 75WP, TM 459 1.67SC, TM 465, TM 473 4FL	--	no

New Product Tests for Bacterial Canker

A study of bacterial diseases on tomato was conducted at Michigan State University using raised beds spaced 8 ft apart. Planting holes were punched in the tops of the beds using a water wheel with a hole spacing of 18 in. on 8 June and one 'Mt Spring' transplant from a 72-cell plug tray was planted in each hole. Treatment plots consisted of 20 ft of row with a 2 ft buffer space between treatments within the row, and one buffer row between each treatment row. Treatments were replicated four times in a randomized complete block design. The plot received applications of 20-20-20 (5 lb/A) weekly through the drip tube. Fungicide sprays were applied using a CO₂ backpack sprayer with three 8003XR nozzles spaced 19 in apart. The sprayer was operated at 50 psi and was calibrated to deliver 50 gal/A. Ten sprays were made in 2004 to the 7-day treatments on 26 June; 2, 9, 16, 23, and 31 July; 7, 14, 21, and 25 August. Plots were evaluated for foliar bacterial infection (based on a rating of 0 to 100%) on 2 and 14 September 2004. Yields were taken from the inner five ft of plants on 7 and 15 September 2004. Ten sprays were made in 2005 to the 7-day treatments on 29 June; 6, 13, 20, and 27 July; 3, 10, 17, and 26 August; and 2 September. Plots were evaluated for foliar bacterial and fungal infection and bacterial defoliation (based on a rating of 0 to 100%) on 30 August and 15 September 2005. Yields were taken from the inner five feet of plants on 2 and 13 September 2005.

Defoliation in 2004 was caused by both bacterial canker and bacterial speck. Canker symptoms caused a blighting and yellowing that resulted in death of entire petioles on one side

of the stem. All treatments had less bacterial canker and bacterial speck than the untreated control for the last foliar rating (Fig. 1A). Bacterial pressure in the 2005 trial was moderate with 33.8% bacterial defoliation in the untreated sections by the final rating date. All treatments in 2005, with the exception of Serenade Max + Biotune, had less canker than the untreated control (Fig. 1B).

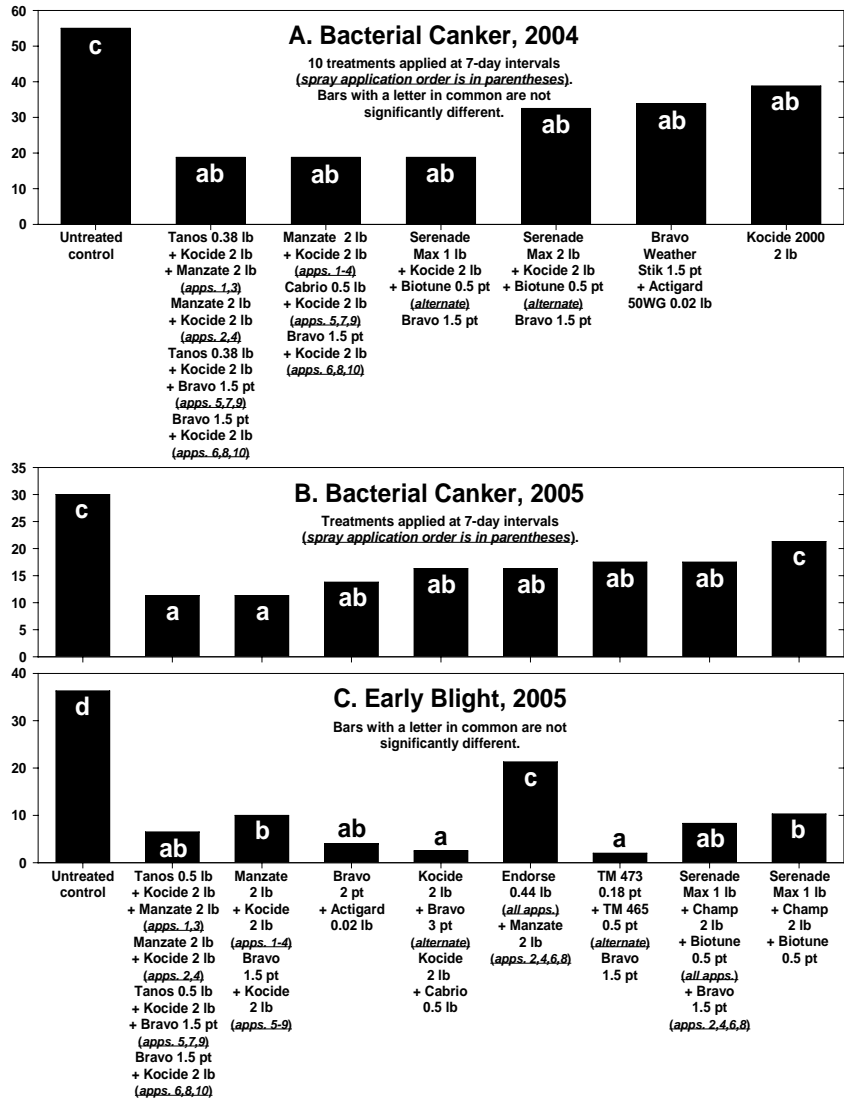
New Product Test for Early Blight

The same treatments evaluated in 2005 for bacterial canker were also rated for early blight. All treatments significantly limited early blight compared to the untreated control, although plants treated with Endorse + Manzate had more disease than all other fungicide treatments (Fig. 1C).

New Product Test for Late Blight

A tomato late blight study was conducted at a grower cooperator's farm in Calhoun County, MI, on a sandy clay loam soil that was previously planted to winter wheat. Plots consisted of one 20-ft row spaced 8 ft apart, with 18 in. between plants. On 9 June, 72-cell 'Mt. Spring' tomato plugs were transplanted into the field. Eighteen treatments were replicated four times in a randomized complete block design. A spore suspension (1×10^5 spores/ml) was prepared from 11-day old cultures of *Phytophthora infestans* (US-6, A1) grown on rye agar and applied to plants in the field on 31 July, 7, 14, and 21 August. Tomato early blight (*Alternaria solani*) infection was suppressed by applications of Endura 70WG (4 oz/A) on 17 July and again on 5 August. Fungicide sprays were applied using a CO₂ backpack boom sprayer equipped with three 8003XR nozzles spaced 19 in. apart, operated at 50 psi to deliver 50 gal/A. Sprays were applied on a 7-10 day schedule on 9, 20, and 25 July; 5, 11, 19, and 27 August; and 4 September. Plants were visually assessed for foliar disease on 26

Fig. 1. New product tests for bacterial canker in 2004 (A) and 2005 (B), and early blight in 2005 (C).



August and 9 September. Yields were taken by stripping the fruit from the three center plants of each treatment plot and the fruit was sorted by disease on 13 September.

Disease developed 7 days after the first inoculation and spread across the plot by the last evaluation date. All treatments provided significant disease control compared to the untreated on the first evaluation date (Fig. 2). All treatments provided significantly better foliar blight control than the untreated on the last observation date. BAS 55007F 4.17SC applied alone had a significantly higher level of disease than the other treatments. All other treatments were very effective in controlling foliar late blight symptoms. As with the foliar ratings, all treatments had fewer infected fruit than the untreated. The treatment of BAS 55007F 4.17SC applied alone had a higher level of infected fruit than the other chemical treatments. The remaining treatments were very effective in controlling late blight fruit infections. There were no significant differences in total yield among treatments and the untreated.

Fig. 2. New product study for late blight, 2004.

