

2006

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Egel, Dan; Zandstra, Butch; and Maynard, Elizabeth T., "On-Farm Evaluation of Tomato Cultivars for Disease Resistance, 2006" (2006). *Purdue Fruit and Vegetable Research Reports*. Paper 16.  
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## On-Farm Evaluation of Tomato Cultivars for Disease Resistance, 2006.

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**Introduction.** Bacterial spot of tomatoes (*Xanthomonas campestris* pv. *vesicatoria*) causes lesions on leaves, stems and fruit. Under conditions of hot, humid, rainy weather, defoliation can result in a loss of yield. In addition, lesions on fruit result in a direct loss of marketability. This disease is managed primarily with applications of fixed copper bactericides, crop rotations, greenhouse sanitation and healthy seed/transplants. Even in properly managed commercial fields, however, bacterial spot can cause yield losses.

Although there are no varieties with complete resistance to bacterial spot, we report here the results of an on-farm trial that indicates some varieties may have partial resistance.

**Methods.** Seeds of 18 varieties were planted in the greenhouse facilities of Butch Zandstra in Lake County, IN. Transplants were planted in the field on 7 June in a completely randomized design with 4 replications. Replications 1 - 3 consisted of 50 plants; plant number in the fourth replication varied from 6 to 50. The plants were placed on 3 foot-wide black plastic and were staked and weaved. A contact fungicide and fixed copper bactericide were applied approximately weekly from 1 July until 16 September.

On September 12, each plot was rated for bacterial spot using the Horsfall-Barratt scale (J.G. Horsfall and R.W. Barratt, *Phytopathology* 35:655). The Horsfall-Barratt scale is a log<sub>10</sub>-based scale used to assign percent foliage affected into one of 11 severity classes. Because it is a log scale, disease severity ratings representing low and high severities are of a relatively narrow range of percents than midrange percent classes. The ratings were analyzed by ANOVA and means were separated using Fisher's protected least significant difference at P=0.05. The Horsfall-Barratt ratings were converted back into percents for presentation using the Elanco Conversion Tables (Eli Lilly Company, Indianapolis, IN).

**Results and Discussion.** There were significant differences in the amount of disease present on the varieties on 12 Sep. The percent of disease ranged from a mean of 25.8 percent for Mountain Fresh to 89.5 percent for Applause. Since the only disease rating was performed relatively late in the season, the percents shown below are a snapshot of the amount of disease present and do not reflect the amount of disease that occurred over the entire season. However, the size of the differences shown here suggests that partial resistance to bacterial spot could play a part in the management of this disease.

Table 1. Disease rating for fresh market tomato varieties grown in Lake Co., IN, 2006.

| Variety    | Disease Rating <sup>z</sup> | Variety           | Disease Rating <sup>z</sup> |
|------------|-----------------------------|-------------------|-----------------------------|
| Applause   | 89.5 a <sup>y</sup>         | Crista F1         | 51.6 bcd                    |
| Indy       | 74.2 ab                     | Florida 7514      | 48.4 bcd                    |
| Bella Rosa | 74.2 ab                     | Linda             | 45.3 cd                     |
| Sebring    | 72.7 ab                     | Celebrity Supreme | 45.3 cd                     |
| Paragon    | 63.3 bc                     | Fabulous          | 40.6 cd                     |
| Florida 91 | 60.9 bc                     | Red Sun           | 39.1 cd                     |
| Amelia     | 56.3 bc                     | Biltmore          | 32.8 cd                     |
| HMX 5826   | 56.3 bc                     | BHN 589           | 32.8 cd                     |
| Phoenix    | 50.8 bc                     | Mountain Fresh    | 25.8 d                      |

<sup>y</sup>Plots were rated for severity of bacterial spot using the Horsfall-Barratt scale. Ratings converted to percent foliage affected.

<sup>z</sup>Means within each column with a letter in common are not significantly different ( $P=0.05$ , LSD).

Acknowledgments: Tomato seed was donated by Johnny's Selected Seeds, Harris Moran, Rispens Seeds, Rupp Seeds, Sakata Seeds, Seminis, Seedway, and Syngenta/Rogers Brand.

Originally published in Midwest Vegetable Variety Trial Report for 2006. Compiled by Elizabeth T. Maynard and Christopher C. Gunter. Bulletin No. B18048. Dept. of Horticulture and Landscape Architecture and Office of Agricultural Research Programs, Purdue University, W. Lafayette, Indiana. December 2006.