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Bacterial Spot Susceptibility in Low Chilling Peaches[1]

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Bacterial spot caused by *Xanthomonas pruni* (E. F. Sm.) Dows. is a major disease of peach in the more temperate regions of the Eastern United States. Breeding for resistance has been a goal in improvement programs and many new peach and nectarine cultivars have relatively high levels of resistance. Bacterial spot is common in peach growing areas of central Georgia, much less common in North Florida and until 1979 had not been observed in North-central Florida. It was mistakenly thought that the bacterium was not adapted to the North-central Florida climate but it now appears that the breeding program (about 30 years) and industry (about 15 years) were not old enough for the bacteria to have time to establish itself. However, it is conceivable that new strains of the bacteria have developed which are now adapted to lower and warmer latitudes. Finally, it may be environmental conditions have recently been unusually favorable for development of the disease, especially in 1979-80. If this is the case, a remission in bacterial spot would be expected in the following years. Seven selections and cultivars became seriously affected in 1979 in the variety test orchard of the University of Florida at Gainesville. A major outbreak of bacterial spot occurred in the same orchard in 1980 and an evaluation of susceptible and resistant germplasm was made.

Bacterial spot was present only in the southeast corner of the test block in 1979 but occurred on various clones throughout the test block in 1980. Each clone was represented by 2 to 4 trees. The trees of each clone were quite uniform in susceptibility or resistance to the disease. Both highly susceptible and resistant clones were evident in 1980. Although no attempt has been made to breed and select for bacterial spot resistance in the low chilling Florida germplasm pool, it was not surprising some clones with high resistance were found, because resistant, temperate-zone cultivars have repeatedly been incorporated into our germplasm pool in order to obtain high fruit qualities. The presence of resistance in our germplasm pool shows the value of having a widely diverse germplasm base in the breeding program. The presence of high resistance in a population not

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previously screened for bacterial spot resistance indicates resistance is controlled by a relatively few major genes and the surprisingly large number of highly resistant plants indicates some dominance for resistance. Also these genes were readily incorporated into a germplasm pool. It is possible some resistance existed in the original sources of low chilling germplasm, but the few old line selections still carried are susceptible.

Ratings were made on leaves only as there were no fruit in 1980 due to a late spring freeze. Ratings were made from 1 = no leaf symptoms to 5 = severe symptoms with 15 or more shot holes per severely infected leaf. The 5 rating generally had 2/3 premature leaf shedding by mid-August. Ratings above 3 were considered too susceptible for commercial potential.

Ratings of the selections and cultivars on which bacterial spot was first observed in 1979 were compared with 1980 ratings (Table 1). The 1979 and 1980 ratings did not differ significantly, suggesting there were no differences in susceptibility of these clones from year to year or between May and August of 1980. Cultivars with chilling requirements ranging from 100 to 450 hours were rated for susceptibility (Table 2). There was no relationship between chilling requirement and de-

Table 1. Bacterial Spot susceptibility in 1979 and 1980 on clones exhibiting leaf symptoms. 1 = no leaf symptoms, 5 = severe leaf symptoms.

	1979	1980	
	March	May	August
Fla. 5-12	3	4	2
Fla. 8-12	2	4	5
Fla. 6-1	5	–	5
Fla. 5-2	2	4	3
Fla. 1-3	4	3	3
Flordagold	2	3	3
Maravilha	3	4	5
	3.0	3.5	3.0

Table 2. Bacterial spot susceptibility among cultivars in 1979 and 1980. 1 = no leaf symptoms, 5 = severe leaf symptoms.

Cultivar	Chilling requirement (hrs.)[1]	1979	1980	
		May	May	August
	Peaches			
Flordared	100	–	–	5
Flordabelle	150	–	–	4
Flordabeauty	150	–	–	4
McRed	200	1	1	2
Earlibrande	200	1	4	3
Maravilha	225	3	4	5
Flordasun	300	–	1	1
San Pedro	325	1	3	3
Flordagold	325	2	3	3
Early Amber	350	1	1	1
Desert Gold	350	1	2	3
Flordaking	450	1	2	2
Rio Grande	450	1	–	3
	Nectarines			
Sunred	250	1	1	2
Columbina	250	1	3	3
Sunripe	350	1	2	2
Sunlite	450	1	2	3
Avg.		1.3	2.2	2.9

[1]Estimated hours needed at or below 45.

Table 3. Bacterial spot susceptibility among advanced selections in 1979 and 1980. 1 = no leaf symptoms, 5 = severe leaf symptoms.

Advanced Selections	1979	1980	
	May	May	August
Fla. 5-12	3	4	2
Fla. 5-10	1	3	2
Fla. 10-64	1	3	3
Fla. 5-2	1	4	3
Fla. 3-4N*	1	2	3
Fla. 7-3N	1	1	2
Fla. 7-4N	1	1	2
Fla. 46A4	1	4	4
Fla. 3-2	1	3	3
Fla. 5-14N	1	4	3
Fla. 5-15N	–	3	3
Fla. 5-18	–	2	3
Fla. 5-19	–	2	2
Fla. 5-20	–	3	4
Fla. M6-6N	–	1	2
Fla. 7-7	1	4	4
Avg.	1.1	2.7	2.8

*N = Nectarine

gree of susceptibility. It is obvious that both low and high levels of resistance were found throughout the chilling range of cultivars even though there is about a month's difference in time of bloom. Thus time of bloom had no effect on susceptibility of cultivars.

Advanced selections with cultivar release potential were also rated for susceptibility (Table 3). As with cultivars, there were large variations among selections; some were highly resistant and some highly susceptible.

Average ratings of cultivars and selections are presented in Table 4. The cultivar group included mostly older clones (10 to 20 years old), the advanced selections group mostly moderate-age clones (5 to 10 years old), and the all selections group was primarily newer clones (3 to 5 years old). It is apparent from the 1980 ratings that there has been no population shift in the Florida germplasm toward resistance or susceptibility. The increase in 1980 ratings over the 1979 ratings is explained by the larger area over which the inoculum was spread in 1980. Table 1 clearly shows 1980 was not climatically more favorable to the disease than 1979, since infected plants were just as badly infected in 1979 as in 1980.

Table 4. Average bacterial spot susceptibility in peach cultivars and selections in 1979 and 1980. 1 = no leaf symptoms, 5 = severe leaf symptoms.

	1979	1980	
	May	May	August
Cultivars	1.3	2.2	2.9
All selections	1.8	2.3	2.8
Advanced selections	1.1	2.7	2.8

Stark® Encore Peach

JERRY FRECON[1]

A new yellow firm-fleshed late maturing peach has been introduced by Stark Bro's Nurseries & Orchards Co., Louisiana, Missouri. Stark® Encore was introduced because of its outstanding fruit characteristics and its tolerance to bacterial leaf spot (*Xanthomonas pruni*). It is a strong and vigorous tree with an excellent cropping record when other late peaches are bud tender and sensitive to low temperatures.

Stark Encore originated as a cross resulting from Autumnglo pollinated by NJ 58541. The cross was made by Dr. L. F. Hough and Dr. C. H. Bailey at the New Jersey Agriculture Experiment Station in Cream Ridge, New Jersey. It was selected in its first fruiting season and designated C1R27-T88. In its second fruiting season it survived severe late winter temperatures with 75% live buds while other varieties experienced almost total bud kill. The variety was designated NJ 260 and put in variety trials in New Jersey and later distributed to other testing sites in North America and Europe.

Stark Encore (NJ 260 cultivar) has been a regular and heavy cropper in New Jersey for five consecutive years. It has distinguished itself not only because of its cropping record but also because of its tolerance to severe bacterial leaf spot infection present on

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