

## Bacterial Wilt Resistance in Commercial Muskmelon Cultivars

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### Introduction

The number of available muskmelon, *Cucumis melo* L., cultivars with resistance to bacterial wilt, *Erwinia tracheiphilla* (Smith) Dye, has declined along with the importance of Midwestern production. However, current transportation costs have created a resurgence in demand for production in the area. This demand justifies the selection of resistant cultivars (both varieties and hybrids) since bacterial wilt continues to be a major disease of muskmelon, *cucumis melo* L., in the Midwest (1,3 and 6). Though transmission of the bacterium was demonstrated to occur by insect vectors prior to the turn of the century (2), (primarily by the striped cucumber beetle, *Acalymma vittatum* (F.)); no adequate means of protection from the disease existed before the advent of modern insecticides (1). Control of the vectors by insecticide application has reduced incidence of the disease, but significant losses still occur (3). No extensive effort has been made to develop cultivars with high levels of resistance. The development of bacterial wilt resistant cultivars and hybrids would reduce those losses and provide an alternative to the current indirect method of disease control.

This research was initiated to evaluate commercially adapted muskmelon cultivars for resistance to bacterial wilt. The search was initiated in commercial germplasm to permit easier selection of disease resistant cultivars with horticulturally acceptable traits. Seed of 187 cultivars were acquired from the vegetable seed industry, the National Seed Storage Laboratory, Fort Collins, CO, and public melon breeders. This germplasm was screened for resistance in both the field and greenhouse. No cultivar with adequate resistance for unprotected commercial production was found, but several cultivars contained resistant plants in frequencies adequate to allow the selection of resistant cultivars.

### Materials and Methods

Cultivars were evaluated for bacterial wilt resistance in three separate trials. The number of cultivars and plants tested per cultivar varied between trials and within each trial due to availability and germination of seed. In 1976, a field evaluation was conducted where transmission of the pathogen was dependent upon feeding by field populations of striped cucumber beetles. In 1977 and 1979, seedlings were inoculated with the bacterium in greenhouse trials.

*Field.* The 1976 trial was planted in a commercial field located 3.2 km SE of Vincennes, IN, in the center of a major melon production area about 4.8 km wide and 16 km long that contained about 810 hectares of muskmelon and 2025 hectares of watermelon. Field preparation and routine vegetable production practices were provided by the grower and were identical to those of his commercial fields except that no pesticide program was applied. Transplants of 67 cultivars were grown in cold frames

using veneer "dirt bands" (8.9 x 8.9 x 10.2 cm) filled with spent mushroom compost as growing medium (4). Seedlings were transplanted at the 3-4 true leaf stage during mid-May with five plants/row (1.5 m apart) in rows 1.8 m wide. Plots were separated by 4.6 m wide alleyways. The experiment was replicated three times with five plants per cultivar per replication. To estimate beetle populations, counts of striped cucumber beetle adults were made May 24 and June 7. Symptoms and mortality associated with bacterial wilt were recorded weekly.

*Greenhouse.* Greenhouse trials were conducted in 1977 and 1979 to provide a uniform evaluation of cultivars for bacterial wilt resistance. Greenhouses were operated at 30 C with 24 h light from 40 watt Luxor Vita-Lite Lamps suspended 27 cm above the plants with one bulb/0.28 m<sup>2</sup> of bench space. Seedlings were grown in Jiffy 64<sup>®</sup> trays with Jiffy Plus<sup>®</sup> potting medium. They were watered daily and received no additional fertilization. Greenhouse trials were designed as randomized complete block experiments with four replications and 16-24 seeds planted per cultivar per replication.

Seedlings were inoculated with bacterial wilt at the fully expanded cotyledon stage, five days after planting. Inoculum for the 1977 trial was prepared from an *E. tracheiphila* culture isolated at Vincennes, IN, during 1976. Inoculum culture for the 1979 trial was from a culture provided by H. M. Munger, Cornell University. Inoculum was prepared according to Reed and Stevenson (3) from inoculated infected muskmelon seedlings cv. Perlita which exhibited wilting of both cotyledons. Virulence of inoculum was established on the response of susceptible check cultivars (Charentais Imp. and Perlita). In 1977, seedlings were inoculated using a #1 cork through which eight randomly placed pins protruded a distance of 1 mm (3). In 1977, plants surviving initial inoculation were reinoculated (on 1st and 2nd true leaves) to reduce the chance of escapes. During the 1979 trial, a single cotyledon inoculation was made using the 15-pin inoculation dispenser with reservoir described by Reed and Stevenson (3).

Totals of 100 and 185 cultivars were evaluated in 1977 and 1979 respectively. To determine whether frequencies of resistant plants might vary between sources of seed of the same cultivar, lots from several companies were tested in 1979, increasing the number of treatments evaluated from 185 to 323. Due to the large number of treatments, only two replications were used in 1979. Seedling mortality was recorded twice weekly during greenhouse evaluations. Percent survival was computed by dividing the number of surviving seedlings by the number of inoculated seedlings. Percent survival data presented in Tables 1-4 are means of the percent survival computed for each replication. During the 1979 trial, surviving plants were visually rated for symptoms of the disease. A 1-5 rating scale was used where: 1 = plants without symptoms, 2 = plants with chlorosis or wilting on cotyledons or lower leaves, 3 = plants with chlorosis or wilting in upper or terminal growth, 4 = plants with chlorosis or wilting throughout and dwarfed in size and 5 = plants dead.

## Results

Resistance evaluations during 1976, 1977 and 1979 are reported in Tables 1 through 5. All of the cultivars were tested in combined trials, but have been grouped into hybrids (Table 1), commercially available varieties (Table 2), obsolete cultivars (Table 3), breeding lines (Table 4), and a list of promising resistance sources (Table 5). Mean percent survival of 46.3, 9.6 and 1.1 were observed, respectively for the 3 trials. For the 1976 evaluation, striped cucumber beetle adult counts averaged 2.75 beetles per plant and ranged from 0 per plant on the least attractive cultivar to 12.2 on the most attractive. Percent survival of the susceptible check cultivar Perlita were 60, 2, and 0 and of the susceptible check cultivar Charentais Improved were 8, 6, and 0 for the three trials. Cultivars; Wescan, Burrell's Gem, Hales Best, Harvest Queen, Hearts of Gold,

TABLE 1. Summary of response of muskmelon hybrids screened for resistance to bacterial wilt, *Erwinia tracheiphila* (Smith) Dye.

Cultivar	1976		1977		1979	
	# Tested	% Survival	# Tested	% Survival	# Tested	% Survival
Alaska Hy	—	—	—	—	49	0
Ambrosia Hy	—	—	—	—	48	0
Ball 1776 Hy	—	—	—	—	41	0
Burpee Hy	15	20	31	10	71	3
Bushwopper Hy	—	—	—	—	68	0
Canada Gem Hy	—	—	—	—	47	0
Carnival Hy	—	—	—	—	43	0
Chaca #1 Hy	—	—	—	—	46	0
Chando Hy	—	—	—	—	73	0
Classic Hy	15	67	23	10	48	0
Crenshaw Hy	—	—	—	—	62	0
Croustillan Hy	—	—	—	—	61	0
Dixie Jumbo Hy	15	40	—	—	49	0
Earlisweet Hy	—	—	—	—	61	0
Early Dawn Hy	—	—	—	—	48	0
Giant Hy	—	—	—	—	58	0
Golden Crispy Hy	—	—	—	—	58	0
Gold Star Hy	—	—	—	—	50	0
Harmony Hy	—	—	—	—	49	0
Harper Hy	15	73	36	10	48	0
Honey Drop Hy	—	—	—	—	51	0
Known-You Hy	—	—	—	—	46	0
Luscious Hy	—	—	—	—	45	0
Mainerock Hy	—	—	—	—	43	0
Market Pride F2 Hy	15	73	54	10	46	0
Midwest Extra Early HY	—	—	—	—	47	0
Minnesota Hy 16	—	—	—	—	47	0
Minnesota Hy 26	—	—	—	—	14	0
Oval Chaca Hy	—	—	—	—	48	0
Roadside Hy	—	—	—	—	46	0
Samson Hy	—	—	—	—	43	0
Saticoy Hy	15	47	31	19	45	0
Scoop Hy	—	—	—	—	49	0
Star Headliner Hy	—	—	—	—	46	0
Star Trek Hy	—	—	—	—	47	2
Summet Hy	—	—	—	—	46	0
Sundae Fl Hy	—	—	—	—	48	0
Super Hy	—	—	—	—	29	11
Super Market Hy	15	47	60	10	44	0
Supreme Delight Hy	—	—	—	—	44	0
Sweetie Hy	—	—	—	—	11	0

Pride of Wisconsin, and Schoon's Hard Shell had the highest percent survival in 1976. Cultivars; Persianet, Md 63-53, Rocky Ford Poleock, Emerald Gem, PMR-8, Rocks, and Burrell's Gem had the highest percent survival in 1977. Cultivars; Burrell's Gem,

TABLE 2. Summary of response of commercial muskmelon cultivars screened for resistance to bacterial wilt, *Erwinia tracheiphila* (Smith) Dye.

Cultivar	1976		1977		1979	
	# Tested	% Survival	# Tested	% Survival	# Tested	% Survival
Amarelo	—	—	—	—	39	0
Banana	15	47	32	20	97	4
Bender's Surprise	—	—	—	—	107	2
Bush Midget	—	—	—	—	67	0
Casaba, Golden Beauty	13	8	59	0	74	0
Casaba, Sun Gold	—	—	—	—	33	0
Cavillon Red-Fleshed	—	—	—	—	38	0
Charentais Improved	12	8	24	6	47	0
Chilton	—	—	—	—	77	0
Crenshaw	14	7	41	0	118	0
Crenshaw Golden	—	—	—	—	44	0
Cum Laude	12	7	35	12	46	0
Delicious 51	15	60	55	5	508	1
Dr. Jaegar's Mildew Res.	—	—	—	—	35	3
Dwarf	—	—	—	—	37	3
Early Delicious 51	—	—	29	0	77	0
Early May	10	50	27	5	53	0
Early Sugar Midget	—	—	10	0	26	0
Eden Gem	15	47	5	0	43	0
Edisto	15	40	9	5	132	1
Edisto 47	15	60	43	12	227	2
Far North	—	—	—	—	81	0
Fordhook Gem	15	47	48	10	31	0
Four-Fifty (450)	15	60	34	0	37	0
Giant	15	20	47	7	42	0
Gold Cup	15	40	51	10	26	0
Gold Cup 55	—	—	—	—	45	0
Golden Champlain	—	—	—	—	86	1
Golden Honey	15	53	49	5	46	0
Golden Perfection	15	40	37	8	80	1
Gold Lined Rockyford	—	—	—	—	44	0
Granite State	—	—	—	—	48	0
Green Nutmeg	—	—	—	—	47	0
Gulfcoast	—	—	—	—	72	0
Gulfstream	15	27	64	15	76	3
Gusto 45	—	—	48	3	46	0
Hales Best	15	80	33	5	222	.5
Hales Best 36 Improved	15	40	42	8	290	1
Hales Best 936	15	60	29	22	27	0
Hales Best Jumbo	15	53	50	14	378	1
Hales Best Jumbo Improved	—	—	—	—	54	0
Haogen	—	—	—	—	37	0
Harvest Queen	15	80	36	8	370	1
Hearts of Gold	15	80	57	19	472	2
Honey Rock	14	43	41	13	464	2
Honey Rock Improved	—	—	—	—	40	2
Illinois Hardshell	—	—	—	—	42	2

TABLE 2.—Continued

Cultivar	1976		1977		1979	
	# Tested	% Survival	# Tested	% Survival	# Tested	% Survival
Imperial 5	—	—	—	—	37	0
Imperial 45	—	—	—	—	49	0
Imperial 4-50	15	20	57	9	42	0
Imperial 45-S12	15	53	58	2	31	8
Iroquois	15	73	56	8	551	4
Kangold	15	33	50	19	122	3
King Henry	15	20	46	3	35	3
Knight's Early	—	—	—	—	40	0
Mammoth	—	—	58	19	48	2
Midget	—	—	—	—	47	0
Mildew Resistant 45	—	—	—	—	93	1
Minnesota Honey	—	—	—	—	43	0
Minnesota Honey Mist	—	—	—	—	38	0
Minnesota Midget	—	—	36	15	114	2
New Ideal	—	—	29	22	79	1
No 45-SJ	—	—	39	2	27	0
Ogen	11	0	44	2	23	2
Old Time Tennessee	15	0	57	13	39	0
Osage	—	—	—	—	42	2
Pennsweet	—	—	—	—	64	3
Perfection	15	60	59	7	94	0
Perlita	15	27	67	2	79	0
Persian Small	—	—	43	8	31	0
Planter's Jumbo	15	53	48	2	226	.4
PMR-45	14	29	64	9	122	1
PMR-450	13	31	27	2	45	0
Pride of Wisconsin	15	80	38	4	275	1
Queen Of Colorado	15	67	37	0	110	1
Resistance #45	—	—	—	—	41	7
Rio Gold	15	33	49	3	31	0
Rocky Ford	15	53	43	16	261	.4
Rocky Ford, Earliest	—	—	—	—	45	0
Rocky Ford, Poleock	—	—	31	29	65	5
Roi du Nord	—	—	—	—	42	0
Schoon's Hardshell	15	80	42	7	280	.3
Short 'N' Sweet	—	—	—	—	55	0
Shumway's Giant	—	—	—	—	40	0
Sierra Gold	15	7	17	5	33	0
Smith's Perfect	—	—	34	13	177	0
Spartan Rock	15	53	35	6	174	0
Sugar Salmon	15	53	49	20	47	0
Sulphur Resistant 59	—	—	—	—	56	0
Sulphur Resistant 91	—	—	—	—	39	0
Sweet Granite	—	—	—	—	32	0
Tam Uvalde	—	—	—	—	49	0
Texas No. 1	—	—	30	5	86	0
Tip Top	—	—	—	—	32	0
Top Mark	—	—	50	11	48	0
Turkey	15	53	55	5	47	0
Yellow Canary	—	—	—	—	14	7

TABLE 3. Summary of response of obsolete muskmelon cultivars screened for resistance to bacterial wilt, *Erwinia tracheiphila* (Smith) Dye.

Cultivar	1976		1977		1979	
	# Tested	% Survival	# Tested	% Survival	# Tested	% Survival
Arizona 13	—	—	—	—	26	5
Burpee's Fordhook	—	—	55	13	47	0
Burrell's Gem	15	93	43	25	25	25
Burrell's Superfecto	—	—	10	10	12	0
Bush, M.M.	—	—	9	8	7	0
Campo	5	20	—	—	45	0
Daisy	15	53	36	9	42	7
Dulce	10	30	36	2	53	0
Early Mayfair	—	—	59	14	41	0
Early Sunrise	—	—	—	—	37	5
Early Wonder	—	—	—	—	8	16
Emerald Gem	—	—	33	29	29	7
Extra Early Hackensack	—	—	20	5	41	0
Extra Early Sunrise	—	—	55	0	36	0
Healy's Pride	15	73	30	3	15	0
Honey Ball	—	—	12	6	46	0
Jenny Lind	—	—	28	5	48	0
Jewel	10	50	22	6	32	12
Kilgore's Hummer	—	—	26	17	46	0
Milwaukee Market	—	—	23	8	58	0
Perfecto	—	—	35	23	48	0
Perfecto, Perfected	—	—	61	27	—	—
Persianet	8	25	26	36	44	0
Pink Queen	—	—	20	8	44	0
Queen Anne's Pocket	—	—	13	0	34	3
Rock "O" Honey	—	—	29	14	45	2
Seneca Delicious	—	—	19	12	46	0
Sheridan	—	—	27	0	46	0
Ward's Ideal	—	—	13	5	49	2
Woodside Winner	—	—	16	5	62	0
Yate's Surprise	—	—	27	4	43	0

Early Wonder, Jewel, Super Hybrid, Imperial 45-S12, Resistant No. 45, and Yellow Canary, had the highest percent survival in 1979. Cultivars; Burrell's Gem, Early Wonder, Jewel, Super Hybrid, Yellow Canary, Imperial 45-S12, Resistant No. 45, Daisy, and Early Sunrise had the lowest mean disease severity ratings in 1979. Twenty-six cultivars had disease severity ratings of 1.00 for surviving plants in 1979 (Table 5).

Analysis of variance for all three trials demonstrated significant differences between cultivars. F values of 3.676 for 66/132 df in 1976 and 2.507 for 99/297 df in 1977 were both significant at .01 probability. The 1979 trial was transformed with Arcsin because of the large number of cultivars with 0 percent survival. The F value of 1.334 for 184/184 df in 1979 was significant at .05 probability. A Bayes LSD (BLSD) was used to separate the large number of means (5). For the 1976 trial BLSD's of 31, 36, and 48 indicated significant differences between cultivars at K values of 50, 100, and 500. For 1977, BLSD's of 17.2, 20.1, and 27.3 indicated significant differences.

TABLE 4. Summary of response of muskmelon breeding lines screened for resistance to bacterial wilt, *Erwinia tracheiphila* (Smith) Dye.

Cultivar	1976		1977		1979	
	# Tested	% Survival	# Tested	% Survival	# Tested	% Survival
AC 67-59	—	—	—	—	34	3
Cobmelon	4	25	32	5	41	0
Doublon	—	—	—	—	40	0
Earl's Favorite	—	—	—	—	14	0
GA-47	5	60	41	14	81	0
Jacumba	5	20	33	0	32	0
MD 63-53	15	47	54	34	51	0
Ogon 9	—	—	—	—	65	0
PMR-5	3	0	33	2	46	0
PMR-6	15	40	19	0	—	—
PMR-8	10	30	18	28	46	2
PMR-29	—	—	—	—	64	0
Purdue 44	—	—	25	4	40	0
Rocks	10	60	28	27	49	0
Santa Claus	—	—	—	—	37	2
Seminole	—	—	—	—	23	0
Wescan	5	100	23	5	57	0
Yellow Green	15	40	28	7	45	0

For 1979, BLSD's of 14.1 and 18.8 indicated significant differences at K values of 50 and 100.

### Discussion

No muskmelon cultivar tested has an adequate frequency of bacterial wilt resistant plants to be used in commercial plantings without insecticide protection; however, a substantial number of lines had sufficient frequencies of resistant plants to be used as germplasm for developing resistant varieties and hybrids. The 1979 trial provides the best comparison to select cultivars for four reasons.

First, it was the only trial in which plants of the susceptible check cultivars Perlita and Charentais Improved were completely killed. The 1976 trial was not simply an evaluation of bacterial wilt resistance; but, also an evaluation of striped cucumber beetle feeding preference. It is of interest, however, that those lines with 80 to 100 percent survival in the 1976 trial, with the exception of Wescan, had surviving plants in the 1979 trial. In 1977 some plants of the check cultivars escaped infection with the disease, even when inoculated 3 times. Of the 7 most resistant cultivars of the 1977 trial, Persianet, Md 63-53, and Rocks proved to be totally susceptible in the 1979 trial.

Second, of the 54 cultivars with frequencies of resistant plants in 1979, plants of only 3 of these lines were all susceptible, either in 1976 or 1977. Because all 3 of these cultivars had relatively low frequencies of resistant plants in 1979; the probability of a resistant plant occurring in the small number of plants tested in the earlier test could explain these inconsistencies. For instance, Queen Anne's Pocket had 3 percent survival in 1979, but none in 1977, when only 13 plants germinated for evaluation.

Third, the 1979 evaluation was much more inclusive of cultivars than the earlier trials.

TABLE 5. Response of cultivars identified as sources of resistance to bacterial wilt *Erwinia tracheiphila* (Smith) Dye.

Cultivar	1976		1977		1979	
	Percent Survival	Percent Survival	Percent Survival	Disease Rating		
				Overall	Survivors	
Burrell's Gem	93	25	25	3.75	1.00	
Early Wonder	—	—	16	4.35	1.00	
Jewel	50	6	12	4.45	1.00	
Super Hy	—	—	11	4.50	1.30	
Imperial 45-S12	53	2	8	4.70	1.30	
Resistant No. 45	—	—	7	4.70	1.70	
Yellow Canary	—	—	7	4.65	1.00	
Daisy	53	9	7	4.70	1.70	
Emerald Gem	—	29	7	4.88	1.00	
Early Sunrise	—	—	5	4.70	1.00	
Arizona 13	—	—	5	4.75	1.00	
Rocky Ford Poleock	—	29	5	4.80	1.00	
Iroquois	73	8	4	4.81	1.30	
Banana	47	20	4	4.85	1.00	
Kangold	33	19	3	4.88	2.00	
Pennsweet	—	—	3	4.93	2.00	
AC 67-59	—	—	3	4.85	1.00	
Queen Anne's Pocket	—	0	3	4.85	1.00	
King Henry	20	3	3	4.90	2.00	
Burpee Hy	20	10	3	4.85	1.00	
Dr. Jaeper's Mildew Resistant	—	—	3	4.85	1.00	
Dwarf	—	—	3	4.95	3.00	
Gulfstream	27	15	3	4.93	2.50	
Santa Claus	—	—	2	4.90	1.00	
Ogen	0	2	2	4.93	2.00	
Honey Rock Improved	—	—	2	4.90	1.00	
Illinois Hardshell	—	—	2	4.90	1.00	
Osage	—	—	2	4.90	1.00	
PMR-8	30	28	2	4.95	2.00	
Rock "O" Honey	—	14	2	4.95	3.00	
Star Trek Hy	—	—	2	4.85	3.00	
Honey Rock	43	13	2	4.92	1.60	
Mammoth	—	19	2	4.90	1.00	
Ward's Ideal	—	5	2	4.95	3.00	
Edisto 47	60	12	2	4.93	2.50	
Hearts of Gold	80	19	2	4.92	1.20	
Bender's Surprise	—	—	2	4.95	1.50	
Minnesota Midget	—	15	2	4.97	3.50	
New Ideal	—	22	1	4.95	1.00	
Harvest Queen	80	8	1	4.91	1.00	
Golden Perfection	40	8	1	4.93	1.00	
Golden Champlain	—	—	1	4.85	1.00	
Hales Best 36 Improved	33	8	1	4.95	2.70	
Mildew Resistant 45	—	—	1	4.98	2.00	
Pride of Wisconsin	80	4	1	4.95	1.50	



TABLE 5.—Continued

Cultivar	1976		1977		1979	
	Percent Survival	Percent Survival	Percent Survival	Disease Rating		
				Overall	Survivors	
PMR-45	29	9	1	4.99	4.00	
Queen of Colorado	67	0	1	4.99	4.00	
Hales Best Jumbo	53	14	1	4.97	1.30	
Edisto	40	5	1	4.95	1.00	
Delicious 51	60	5	1	4.99	1.80	
Hales Best	80	5	.5	4.98	1.00	
Planter's Jumbo	53	2	.4	4.98	1.00	
Rocky Ford	53	16	.4	4.99	1.00	
Schoon's Hardshell	80	7	.3	4.99	4.00	

1 = plants without symptoms, 2 = plants with chlorosis or wilting on cotyledons or lower leaves, 3 = plants with chlorosis or wilting in upper or terminal growth but remaining vigorous, 4 = plants with wilting or chlorosis throughout and dwarfed in size, 5 = plants that died.

Fourth, the 1979 trial included an evaluation of disease severity which allows comparison based on effect of the disease on surviving plants as well as frequency of surviving plants.

On this basis, muskmelon cultivars; Burrell's Gem, Early Wonder, Jewel, Super Hybrid, Imperial 45-S12, Resistant No. 45, Yellow Canary, Daisy, and Emerald Gem are the most useful cultivars for developing bacterial wilt resistance; however, testing of further lots of Super Hybrid indicated much lower levels of resistant plants. Of those cultivars, Burrell's Gem, Early Wonder, Jewel, Yellow Canary, and Emerald Gem had surviving plants without visible symptoms of the disease (Table 5). Of this group, Burrell's Gem is probably the best source of resistance. It performed well in all trials, had the lowest overall disease rating in 1979, and had no symptom development in surviving plants.

The three cultivars with highest percent survival and six of the 10 with highest survival in the 1979 trial were obsolete cultivars, pointing out the need for preserving these irreplaceable resources. Finding the largest number of cultivars with frequencies of resistant plants to be from obsolete germplasm, indicates that recent trends in commercial muskmelon breeding have decreased numbers of cultivars with resistance to bacterial wilt. Comparisons of seed lots from several companies showed that though normal variance was observed, indications of significantly different frequencies of resistant plant between lots from different companies did not occur.

In summary, 54 cultivars were identified which had frequencies of bacterial wilt resistant plants; but no cultivar tested was adequately resistant for commercial usage without insecticide protection. Among surviving plants, response to the disease varied; possibly indicating that different mechanisms for resistance might be present. Considering the relatively low frequencies of resistant plants and the potential for more than one resistance mechanism, recurrent selection procedures should be effective in development of resistant germplasm. This research provides plant breeders with a list of cultivars which contain frequencies of resistant plants which should assist in the development of bacterial wilt resistant cultivars.

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### Summary

A decline in Midwestern muskmelon production during the past 30 years has resulted in fewer cultivars with resistance to bacterial wilt, *Erwinia tracheiphila*. Levels of resistance in 187 cultivars were assessed in field and greenhouse experiments. Resistance was most common in obsolete muskmelon cultivars and least common in current commercial hybrids. Commercially available cultivars which had resistant plants tended to be older cultivars. Of the 12 cultivars with highest frequency of resistant plants, half are obsolete. No cultivar tested was sufficiently resistant for commercial production without insecticide protection, but resistant plants were observed in many cultivars. Burrell's Gem, Early Wonder, and Jewel had the highest frequency of resistant plants.

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