Okra (*Abelmoschus esculentus*)
Cercospora leaf spot; *Cercospora* spp.
Powdery mildew; *Podosphaera* spp.

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Evaluation of Okra cultivars for leaf spot and powdery mildew tolerance in North Carolina, 2021

This cultivar evaluation was conducted on okra grown at the Central Crops Research Station in Clayton, NC. Okra was direct seeded into field plots on 2 Aug and re-seeded on 9 Aug due to poor stand establishment. The study was arranged in a randomized complete block design with four replications. Plots were established on single 14-ft long raised beds covered with white plastic mulch, on 5-ft centers and 5-ft between plots. Each plot consisted of 7 plants with 2-ft between plants. Additional rows, planted to Clemson Spineless, were included to act as a buffer between rows of tested cultivars. Irrigation and fertilization (N-P-K, 4-0-8) were applied via drip tape once per week. Disease incidence was evaluated as number of plants showing symptoms of either disease divided by the total number of plants in the plot. Severity was estimated as the percent symptomatic leaf area within the plot and yield was determined as total fruit harvested per plot. Assessments were made on 7-day intervals. Data did not meet the assumptions of normality and therefore were subjected to a Kruskal-Wallis test (rank-based nonparametric analysis of variance) and ranked means were separated according to pairwise t-tests of least squares means ($P = 0.1$).

Naturally occurring Cercospora leaf spot and powdery mildew symptoms were observed in the trial area on 14 Sep and 12 Oct, respectively. On 29 Sep, leaf spot incidence was significantly lower for Baby Bubba and Go Big than for all other cultivars, except for Dwarf Green Long Pod and Emerald Green Velvet. By 19 Oct, Emerald Green Velvet had significantly lower incidence than all other tested cultivars, except for Heavy Hitter. The area under the disease incidence progress curve (AUDIPC) was calculated based on incidence ratings recorded from 14 Sep and 19 Oct and was significantly greater in plots of Jing Orange and Red Burgundy when compared with plots of Heavy Hitter, Burmese, Clemson Spineless, Dwarf Green Long Pod, Go Big, and Emerald Green Velvet. Trace amounts of powdery mildew was observed on 12 Oct on cultivars Jing Orange and Star of David. On 19 Oct, significant differences in both incidence and severity were observed among cultivars, with Red Burgundy and Star of David having significantly greater incidence and severity than all other cultivars except for Jing Orange. Yield, as total fruit harvested, differed significantly by cultivar with Jing Orange, Red Burgundy, and Star of David producing significantly greater yield compared with Clemson Spineless, Dwarf Green Long Pod, Go Big, and Emerald Green Velvet.

	Cercospora leaf spot incidence (%)[z]												
Cultivar	14 Sep	21 Sep		29 Sep		4 Oct		12 Oct		19 Oct		AUDIPC[y]	
Jing Orange	24.9	41.0	a	45.1	ab	61.8	ab	87.3	a	92.3	a	2066.5	a
Red Burgundy	17.7	17.7	bc	60.1	a	64.3	a	92.9	a	92.9	a	2025.2	ab
Star of David	22.6	22.6	bc	46.4	ab	54.8	ab	84.5	a	88.1	a	1848.8	abc
Baby Bubba	15.7	15.7	bc	19.3	e	45.7	abc	92.9	a	96.4	a	1629.3	bcd
Heavy Hitter	15.7	19.3	bc	32.4	bc	54.3	ab	69.2	ab	82.5	ab	1570.5	cd
Burmese	6.3	6.3	c	39.6	abc	45.8	abc	81.3	a	89.6	a	1546.9	cde
Clemson Spineless	19.1	19.1	bc	33.9	bcd	37.5	abc	73.8	ab	85.7	a	1527.4	cd
Dwarf Green Long Pod	18.3	19.2	ab	19.2	de	24.2	c	90.0	a	95.0	a	1497.1	cde
Go Big	8.3	12.7	bc	18.3	e	28.3	c	74.2	ab	91.7	a	1305.1	de
Emerald Green Velvet	14.9	19.1	bc	26.8	cde	35.1	bc	46.4	b	46.4	b	1108.0	e
$P > \chi^{2x}$	0.2944	0.0705		0.0025		0.0590		0.0872		0.0877		0.0084	

[z]Values represent the average Cercospora leaf spot incidence (%) ratings before ranking and are based on the number of plants with symptoms per plot. Means within columns followed by the same letter are not significantly different according to pairwise t-tests of least squares means ($P = 0.1$).
[y] Area under the disease incidence progress curve (AUDIPC) values based on ratings from 14 Sep through 19 Oct.
[x] *P*-values based upon a Kruskal-Wallis test (rank-based nonparametric analysis of variance).

	Powdery mildew incidence (%)		Powdery mildew severity (%)[z]		
Cultivar	12 Oct	19 Oct	12 Oct	19 Oct	Total Yield
Jing Orange	11.9	53.7 a	0.5	2.0 a	35.25 a
Red Burgundy	0.0	13.6 b	0.0	0.5 b	27.25 ab
Star of David	3.6	3.6 bc	0.3	0.3 bc	23.25 abc
Baby Bubba	0.0	0.0 c	0.0	0.0 c	17.75 bcd
Heavy Hitter	0.0	0.0 c	0.0	0.0 c	14.75 bcde
Burmese	0.0	0.0 c	0.0	0.0 c	14.25 cde
Clemson Spineless	0.0	0.0 c	0.0	0.0 c	10.75 de
Dwarf Green Long Pod	0.0	0.0 c	0.0	0.0 c	10.00 de
Go Big	0.0	0.0 c	0.0	0.0 c	7.75 e
Emerald Green Velvet	0.0	0.0 c	0.0	0.0 c	6.50 e
$P > \chi^{2y}$	0.1036	0.0006	0.1086	0.0011	0.0043

[z] Values represent the average powdery mildew severity ratings before ranking and are based on a visual estimation of the percent symptomatic leaf area within the plot. Means within columns followed by the same letter are not significantly different according to pairwise t-tests of least squares means ($P = 0.05$).

[y] *P*-values based upon a Kruskal-Wallis test (rank-based nonparametric analysis of variance).