

Tolerance of watermelon cultivars to cucurbit anthracnose, 2017

Watermelon cultivars were seeded in the greenhouse on 25 Mar and transplanted on 11 May into a field at the Cherry Research Farm in Goldsboro, NC (N35°22'12.3"; W78°02'55.7"). Watermelons were transplanted on raised beds (3-ft wide, 30-ft long with 10-ft fallow borders) covered with white plastic mulch at 3-ft spacing. Each experimental unit consisted of one plot of ten plants per cultivar, and replicated four times for each cultivar and arranged in a randomized complete block design. Loamy soil was present under all four replications. The field was previously cropped to watermelons, strawberries, and soybeans during the 2016, 2015, and 2014 growing seasons, respectively. Plants were fertilized weekly with at least 10 gallons of fertilizer (4-0-8) per acre. Plants were supplied with approximately 1 in. of water per week, as necessary, using drip tape under the plastic. Each plant was inoculated on three dates with a water suspension of 4.8×10^5 conidia/liter (approximately 5,000 conidia/plant or 10.4 ml per plant) using an isolate of *Colletotrichum orbiculare* from North Carolina. Inoculum was applied as a foliar spray using a Solo 425 backpack sprayer and fan nozzle on the following dates: 6 Jun, 13 Jun, and 20 Jun. Disease severity was recorded weekly for six weeks for each plot on 27 Jun, 4 Jul, 11 Jul, 18 Jul, 25 Jul, and 1 Aug. Disease severity was estimated as percent leaf area with necrosis caused by anthracnose. Data was analyzed using the software ARM (Gylling Data Management, Brookings, SD), analysis of variance (ANOVA) and the Tukey's HSD test to separate means.

Anthracnose was first detected on 27 Jun at approximately 1% disease severity across all cultivars in the field. After the initial disease rating, an additional five ratings were taken of all the plots. Total rainfall on the station consisted of 7.17 in., 5.56 in., 3.36 in., and 4.46 in. during the months of May, Jun, Jul, and Aug, respectively. Disease severity was significantly lower on 'Tri-X-313' (9.63%) and was highest on 'Estrella' (21.08%), followed by 'Top Gun' (20.38%). No significant difference was noticed when calculating Tukey's HSD test of means for the remaining cultivars in relation to the less severe 'Tri-X-313' and the most severe 'Estrella'. In the table, cultivars are sorted by the final disease severity to anthracnose rated on 1 Aug.

Cultivar	Disease severity* (%)	Cultivar	Disease severity (%)	Cultivar	Disease severity (%)
Tri-X-313	9.63 b**	Florida Giant	12.79 ab	720	15.5 ab
Troubadour F1	10.25 ab	Congo	13.04 ab	Fantasy	16.42 ab
7387	10.83 ab	Black Diamond	13.17 ab	Dixie Queen	16.83 ab
Tendersweet Orange	11.12 ab	Starbrite	13.29 ab	Yellow Buttercup	16.96 ab
Sangria	11.5 ab	AU Producer	13.79 ab	Jubilee II	17.21 ab
Ruby	11.88 ab	Solitaire	13.88 ab	SSX 8585	17.46 ab
Royal Sweet	12 ab	Bold Ruler	14.42 ab	Moon and Stars	17.54 ab
Sweet Delight	12.17 ab	Mardis Gras	14.75 ab	Vista	19.29 ab
SV0241WA	12.54 ab	Sorbet F1	14.79 ab	Jubilee	19.5 ab
Unbridled	12.58 ab	Provider	14.79 ab	Carolina Cross	19.92 ab
Melody	12.67 ab	Mickylee	14.88 ab	Top Gun	20.38 ab
Secretariat	12.71 ab	Traveler F1	14.92 ab	Estrella	21.08 a

*The final disease severity was calculated for each cultivar based on the percentage of plant tissue that is symptomatic in a plot (foliar lesions). Means shown are the average of the four replications per cultivar.

**Column numbers followed by the same letter are not statistically different ($P=0.05$, Tukey's HSD)