

ROGERS

Fusarium Wilt, Race 3 on Tomato

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Syngenta knows that working with growers to control disease pressures is critical. Our research team is focused on breeding plants that resist diseases, produce higher yields with improved fruit quality. An increasing problem with Fusarium Wilt in tomatoes has resulted in ROGERS® newest introduction SEBRING with resistance to Fusarium race 1, 2, 3.

Fusarium wilt is a highly destructive disease of tomato that is caused by the fungus *Fusarium oxysporum* f. sp. *lycopersici*. There are currently 3 known races (1, 2 & 3) of the fungus.

Fusarium wilt race 3 has a narrow host range. Therefore, genetic resistance can be very effective in controlling the disease, in many cases the only viable means of control. Other, often less effective means of control, that have been tried include soil pasteurization with steam or fumigants, raising low pH soils to 6.5 - 7.0, using nitrate nitrogen instead of ammoniacal nitrogen and even adding mycorrhiza and organic matter to the soil. Long rotations of up to seven years may help reduce the disease incidence, but will not completely remove the fungus from the soil. Genetic resistance to race 3 (I gene) was identified in the 1980's and the University of Florida released breeding lines with the I-3 gene in 1994.

Race 3 occurred on tomato in Brazil in 1966, in Queensland, Australia, and in Florida in 1982. It was reported in Northern Florida and Georgia in 1992, in Mexico in 1996 and in Tennessee in 2000. It has also been reported in California, including in the Sutter Basin and Yolo County. Race 3 has been identified in several commercial production fields in Florida where varieties resistant to races 1 and 2 have developed devastating Fusarium wilt symptoms.

The Fusarium wilt fungus is able to survive in the soil for long periods of time by forming spores, thick walled reproductive structures. It also survives in infested plant debris and in the roots of weeds such as *Malva* and *Amaranthus*. It can be moved readily from field to field in infested soil that may adhere to cultivation or other equipment, or in surface irrigation water runoff from infested fields. Optimal soil temperature for disease development is 80° F, but the fungus can be active in a temperature range of 65° to 95° F. The disease is more common on acidic, sandy soils.

The fungus penetrates root tissue, especially through wounds caused by cultivation or other damage. It then grows up through the plants' vascular system

into the stem. Plants can be stunted if infected when young. On older plants, symptoms often begin as a yellowing and wilting of lower, older leaves. This wilting frequently occurs on only one side of the plant. Fruit set and size can be reduced. Plants may be killed and yield losses may become extensive as the disease progresses. As a diagnostic aid, the vascular tissue of the stem of heavily infected plants typically is discolored reddish-brown.

ROGERS® recently introduced Sebring, a new Eastern beef tomato, which has an extensive disease resistance package including Fusarium wilt races 1, 2, & 3. Sebring is just the first ROGERS® introduction positioned to assist growers in battling this highly destructive race of Fusarium wilt.



Mature plant with yellow wilting.



Reddish-brown vascular discoloration caused by the Fusarium wilt fungus.