



DISEASE NEMESIS

BACTERIAL ANGULAR LEAF SPOT IN STRAWBERRY

Bacterial angular leaf spot is a disease of strawberry plants that causes straight-edged oozing lesions on the leaves. Severe infections can reduce fruit yields up to 70 percent. The bacteria that causes angular leaf spot, *Xanthomonas fragariae*, thrives in cool, wet conditions and spreads through splashing water droplets. This disease is important wherever strawberries are grown in the U.S., but is most prevalent in the Southeast, where weather conditions are often ideal for the bacteria to grow and spread. Strawberry breeders are working to create new cultivars that are both delicious and resistant to this leaf spot, and have already achieved the first step in this process: the identification of two sources of genetic resistance.

These two resistant sources, named US4808 and US4809, were identified from among the over 1700 strawberry accessions maintained in the USDA-ARS National Plant Germplasm System maintains. US4808 was collected in the wild in Minnesota by Margaret Stahler at the University of Minnesota in 1986. US4809 originated from a cross between a commercial strawberry cultivar and a strawberry accession that was collected by the USDA in the 1970s from a farm in Georgia, where the family had selected it from the wild and had been cultivating it as early as 1900. Both sources are resistant to bacterial angular leaf spot but have very poor fruit quality.

This is where strawberry breeders and researchers in the RosBREED project have teamed up to help. RosBREED is a multi-state, multi-institution project dedicated to the genetic improvement of U.S. rosaceous crops by targeted applications of genomics knowledge and tools to accelerate and increase the efficiency of breeding programs. This Coordinated Agricultural Project is funded through the USDA's Specialty Crop Research Initiative. RosBREED's strawberry researchers, led by the team at the University of Florida, closely examined the DNA of US4808 and US4809 and found the needle in the haystack: FaRXf1, the shared genetic factor in both accessions that confers resistance for angular leaf spot. Using this information, the RosBREED DNA Testing Team developed a DNA test that enables rapid evaluation of offspring from crosses made with US4808 or US4809 to determine which have inherited resistance to angular leaf spot.

About half of the offspring from a cross made with one resistant parent will inherit angular leaf spot resistance. Without a DNA test, the breeder would have to inoculate each of the offspring plants to angular leaf spot to evaluate which ones are resistant. Such an assay is expensive and time-consuming. Now, breeders are quickly and efficiently evaluating their young plants for resistance, keeping only the plants they need to help create new cultivars of delicious strawberries that won't succumb to angular leaf spot – a win for growers and consumers alike.