# Black Raspberry - Large Raspberry Aphid Resistance

USDA-ARS, OSU, Danforth Center, and BC Berry Cultivar Development

**Viruses spread by the large raspberry aphid present a significant challenge for the black raspberry industry. In 2006-2007, wild black raspberry was collected across its native range to find new genetic diversity and identify sources of aphid resistance. Screening the 6,500+ seedlings identified strong aphid resistance in three populations. Genetic mapping revealed the sources of resistance, and a DNA marker was developed. These advances have enabled the USDA Caneberry Breeding Program in Oregon to efficiently breed resistant material to help support quality fruit production for the U.S. black raspberry industry.**

Photo by Michael Dossett

Wild black raspberry screened for aphid resistance.

## PROJECT GOALS

- ✓ Develop breeding stock that is resistant to the large raspberry aphid, which transmits detrimental viruses

## Problems Addressed

In North America, viruses transmitted by the large raspberry aphid are a major component of raspberry mosaic disease. Black raspberry necrosis virus (BRNV) especially presents a challenge for the Oregon black raspberry industry. At present, commercial fields in the Pacific Northwest, where production is centered, become nearly 100% infected with BRNV after just two seasons and consequently experience serious decline, resulting in shortened lifespans and poor fruit quality. Aphid resistant cultivars could increase plant longevity, providing growers with consistent fruit production.

## Solutions Developed

Wild black raspberry germplasm was collected from its native range in eastern North America and maintained at the USDA genebank in Corvallis, Oregon. Screenings showed resistance to large raspberry aphids in 3 populations and a resistant clone was saved from each: PI 658505 from Ontario, PI 658506 from Maine, PI 659143 from Michigan. Genetic mapping showed that each had a different genetic source of resistance. Breeders began developing resistant populations from each source as well as combined sources. A cost-effective DNA test helped screen progeny for resistance to the large raspberry aphid.

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