



Lettuce NPGS Germplasm - Verticillium Wilt Resistance

USDA Agricultural Research Service, USA

Resistance to Verticillium Wilt Race 1 was found in 7 accessions of heirloom lettuce varieties in the U.S. National Plant Germplasm System (NPGS). These accessions gave breeders the tools needed to develop new lettuce cultivars resistant to this disease. Iceberg lettuce breeding lines with resistance were developed and both the resistant cultivars and breeding lines have been distributed to breeders and researchers in the U.S. and worldwide.



Photo by Alex Cornwall

Verticillium Wilt resistant cultivar 'Defender'.

PROJECT GOALS

- ✓ Screen germplasm for resistance to Verticillium Wilt Race 1
- ✓ Breed lettuce cultivars with resistance to Verticillium Wilt Race 1

Problems Addressed

Verticillium Wilt is a severe disease in lettuce (*Lactuca sativa*) and has caused crop loss of entire fields in the Salinas and Pajaro Valleys of California, which are part of the prime lettuce growing region in the U.S. The farm gate value of lettuce in this area was \$1.4 billion in 2022 with half of the production in head lettuce. All lettuce types are susceptible to Verticillium Wilt but iceberg lettuce is the most affected. Finding sources of resistance was essential, because cultural and chemical control are not economically or environmentally friendly options.

Solutions Developed

In 2004 and 2005, USDA researchers in Salinas, California conducted resistance screening trials of a wide range of lettuce lines including accessions from the NPGS genebank unit in Pullman, Washington. The researchers found 7 lettuce accessions with resistance to Verticillium Wilt Race 1. Subsequently, the resistance discovered in the trials was incorporated into iceberg lettuce breeding lines. The NPGS has since distributed hundreds seed packets from the 7 resistant accessions as well as the resistant lettuce breeding lines developed by the USDA Salinas station.



Written by: B. Hellier, A. Cornwall, M. Warburton, K. Chen (editor)

To learn more about this and other success stories, visit colostate.pressbooks.pub/pgrsuccessstories