

THE UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
Washington, D.C.

and

THE NORTH DAKOTA AGRICULTURAL EXPERIMENT STATION
NORTH DAKOTA STATE UNIVERSITY
Fargo, North Dakota

NOTICE OF RELEASE OF THREE DOWNY MILDEW RESISTANT (HA 458 TO HA 460) OILSEED
SUNFLOWER GENETIC STOCKS

The United States Department of Agriculture, Agricultural Research Service, and the North Dakota Agricultural Experiment Station, Fargo, ND, announce the release of three downy mildew resistant (HA 458, HA 459, and HA 460) oilseed sunflower genetic stocks. These genetic stocks have been developed to provide diversity for resistance against downy mildew [caused by *Plasmopara halstedii* (Farl.) Berl. & De Toni], a major sunflower disease, and are available for use by industry and public researchers to create parental lines or germplasms with a mid-oleic (NuSun[®]) (>550 and <700 g kg⁻¹ oleic acid) or high-oleic (>800 g kg⁻¹) fatty acid concentration in the oil.

HA 458 is a BC₂F₆-derived BC₃F₇ maintainer genetic stock selected from the cross HA 434*3/PI 468435. HA 434 (PI 633744) is a high-oleic fatty acid germplasm line released by USDA-ARS and the North Dakota Agricultural Experiment Station in 2001. PI 468435 is a wild *Helianthus annuus* L. accession collected near Caldwell, Idaho, in 1979. Plants of the accession were screened with race 730 of downy mildew and a resistant plant was crossed to HA 434. The backcross and pedigree breeding methods were used to develop HA 458. HA 458 is resistant to the North American races 730, 733, and 770 and to the French race 304. Inheritance studies indicated that the resistance was controlled by a single, dominant gene and preliminary molecular marker comparisons indicated that this resistance gene was different from both the *Pl6* and *Pl8* genes. HA 458 averaged 865 g kg⁻¹ oleic fatty acid in seed from plants grown in the Fargo, ND, field nursery during the summer of 2005.

HA 459 is a BC₂F₆-derived BC₃F₇ maintainer genetic stock selected from the cross HA 434*3/PI 435434. HA 434 (PI 633744) is a high-oleic fatty acid germplasm line released by USDA-ARS and the North Dakota Agricultural Experiment Station in 2001. PI 435434 is a wild *Helianthus annuus* L. accession collected near Riviera, Texas, in 1976. Plants of the accession were screened with race 730 of downy mildew and a resistant plant was crossed to HA 434. The backcross and pedigree breeding methods were used to develop HA 459. HA 459 is resistant to the North American races 730, 733, and 770, but is susceptible to the French race 304. HA 459 averaged 873 g kg⁻¹ oleic fatty acid in seed from plants grown in the Fargo, ND, field nursery during the summer of 2005.

HA 460 is a BC₂F₆-derived BC₃F₇ maintainer genetic stock selected from the cross HA 434*3/RHA 340. RHA 340 (PI 518778) is a downy mildew resistant germplasm restorer line released by USDA-ARS and the North Dakota Agricultural Experiment Station in 1987. The resistance to downy mildew in RHA 340 was determined to be controlled by a single, dominant gene, *Pl8*, and is derived from *Helianthus argophyllus* T.& G. The backcross and pedigree breeding methods were used to develop HA 460. HA 460 is resistant to the North American races 730, 733, and 770 and to the French race 304. HA 460 averaged 888 g kg⁻¹ oleic fatty acid in seed from plants grown in the Fargo, ND, field nursery during the summer of 2005. HA 460 represents the first maintainer genetic stock released to combine the high-oleic fatty acid characteristic with the *Pl8* downy mildew resistance.

Small quantities of seed of each genetic stock will be available from the USDA-ARS, Sunflower Genetics Project, Northern Crop Science Laboratory, PO Box 5677, Fargo, ND 58105. Seed of this release will be deposited in the National Plant Germplasm System where it will be available for research purposes. U.S. Plant Variety Protection will

not be requested for HA 458, HA 459, and HA 460.

The release date for these genetic stocks will be on the date of final signature. It is requested that appropriate recognition be made if these genetic stocks contribute to the development of a new germplasm, breeding line, or cultivar.