

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 TWO MAINTAINER (HA 434 AND HA 435) AND
THREE RESTORER (RHA 436, RHA 437, AND RHA 438) HIGH OLEIC SUNFLOWER GERMPLASMS

The United States Department of Agriculture, Agricultural Research Service, and the North Dakota Agricultural Experiment Station, North Dakota State University, announce the release of two maintainer (HA 434 and HA 435) and three fertility restorer (RHA 436, RHA 437, and RHA 438) high oleic oilseed sunflower germplasms. These germplasms are available for use by industry and public researchers to create hybrids, parental lines, or germplasms with a mid-oleic or NuSun fatty acid composition.

HA 434 is a selection from the line HA 424 released by USDA-ARS and North Dakota State University in 1999. A single-seed descent breeding method was used to develop HA 434, utilizing half-seed analyses for fatty acid composition by gas chromatography. After four generations of selection, a breeding line was developed with an average 86.1 % oleic acid in seed produced in the 2000 breeding nursery. Hybrids with the cytoplasmic male-sterile line of HA 434 were produced by crossing with two restorer lines, RHA 373 and RHA 377. These hybrids, cms HA 434/RHA 373 and cms HA 434/RHA 377, produced an average oleic acid composition of 60.2 % in 1999 and 2000 trials planted at Casselton, ND. Agronomic characteristics of these hybrids were similar to the check hybrids cms HA 424/RHA 373 and cms HA 424/RHA 377.

HA 435 is an M_9 -derived M_{10} germplasm developed from a mutagenesis program to alter the fatty acid composition of HA 382. A single-seed descent breeding method was used to advance the M_0 to the M_5 generations after treating seed of HA 382 with *N*-nitroso-*N*-methylurea (NMU). M_5 seed harvested from approximately 6000 M_4 plants were analyzed for fatty acid composition. The M_5 selection M-4229 of HA 382 had an oleic content of 86.1%. A single-seed descent breeding method was used to advance this line from the M_6 to the M_{10} generation, utilizing half-seed analyses for fatty acid composition by gas chromatography. The average oleic composition of HA 435 was 81.6% in seed produced in the 2000 breeding nursery. Hybrids with the cytoplasmic male-sterile line of HA 435 were produced by crossing with two restorer lines, RHA 373 and RHA 377. These hybrids, cms HA 435/RHA 373 and cms HA 435/RHA 377, produced an average oleic acid composition of 55.6% in 1999 and 2000 trials planted at Casselton, ND. Agronomic characteristics of these hybrids were similar to the check hybrids cms HA 382/RHA 373 and cms HA 382/RHA 377.

RHA 436, RHA 437, and RHA 438 are F_4 -derived F_5 fertility restorer germplasms advanced by pedigree selection from the cross RHA 340/RHA 344. RHA 340 is a downy mildew resistant fertility restorer line released by USDA-ARS in 1986 and was derived from an interspecific cross HA 89*3/*Helianthus argophyllus*. RHA 344 is a high oleic fertility restorer line released by USDA-ARS in 1986 and was derived from a cross between RHA 274 and Pervenets (PI 483077). F_3 , F_4 , and F_5 plants from the cross were screened for oleic acid composition and resistance to race Pla 773 of downy mildew [caused by *Plasmopara halstedii* (Farl.) Berl. & De Toni in Sacc.) conferred by the *Pl⁸* resistance gene. RHA 436, RHA 437, and HA 438 also provide protection against strains of downy mildew insensitive to metalaxyl collected from sunflower production fields of North Dakota in 1998 and a new race of downy mildew found in France (Pla 304). Plants of RHA 436, RHA 437, and RHA 438 grown in the 2000 breeding nursery, Fargo, ND, averaged 87.1, 86.2, and 84.1% oleic acid.

Limited quantities of seed of each germplasm are available from the Seedstocks Project, Department of Plant Sciences, Loftsgard Hall, North Dakota State University, Fargo, ND 58105. Seed of this release will be deposited in the National Plant Germplasm System where it will be available for research purposes, including development and commercialization of new cultivars. Plant variety protection will not be applied for.

The release date for these germplasms will be on the date of final signature. Genetic material of this release will be deposited in the National Germplasm System where it will be available for research purposes. Appropriate recognition should be made if this material contributes to the development of a new breeding line or cultivar.

Director, ND Agricultural Experiment Station
Fargo, North Dakota

Date

Administrator, Agricultural Research Service
United States Department of Agriculture

Date