



United States Department of Agriculture

Research, Education, and Economics
Agricultural Research Service

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

AND

NORTH DAKOTA AGRICULTURAL EXPERIMENT STATION
NORTH DAKOTA STATE UNIVERSITY
FARGO, ND

NOTICE OF RELEASE OF HA-DM5, CONFECTION SUNFLOWER

Downy mildew caused by *Plasmopara halstedii* is a yield-limiting disease that occurs in all areas of intensive sunflower production throughout the world. Confection sunflower is more vulnerable to downy mildew than oilseed sunflower due to the lack of resistance sources.

HA-DM5 is a BC2F3-derived BC2F4 confection maintainer selection from the cross of CONFSCLB1*2/CMS CONFSCLB1/*Helianthus annuus* accession PI 435414. CONFSCLB1 is a confection BC1F3-derived BC1F4 maintainer selection from the cross of HA 441/ROM PH//HA 442/HA 441/4/CONF/5/CONF. The line was released by the USDA-ARS and the North Dakota Agricultural Experiment Station in 2006 and is susceptible to downy mildew. The cytoplasmic male sterile (CMS) CONFSCLB1 was developed by substituting the nuclear genome of CONFSCLB1 into the background of a wild annual species *H. petiolaris* (CMS PET1). The wild annual *H. annuus* accession (PI 435414) was originally collected from Paris, Texas in 1978 and is resistant to new virulent races of downy mildew. HA-DM5 was developed using the backcross breeding method and DNA marker-assisted selection for the downy mildew resistance P119 gene introgressed from wild *H. annuus* PI 435414. The cross between CMS CONFSCLB1 and PI 435414 was made in 2013 and the selected resistant F1 plants were backcrossed twice to CONFSCLB1. The BC2F3-derived HA-DM5 is homozygous for the P119 gene verified by DNA markers and downy mildew greenhouse testing. HA-DM5 is immune to the most predominant and virulent races of downy mildew currently identified in the United States. Plant height of HA-DM5 was 171 cm compared to 149 cm for CONFSCLB1, and flowers in 77 days after planting compared to 79 days for CONFSCLB1 in the field nursery at Glyndon, MN during the summer of 2016.

Small quantities of seed of the HA-DM5 germplasm will be available from the North Dakota Foundation Seedstocks Project, Department of Plant Sciences, NDSU Dep. 7670, P.O. Box 6050, Fargo, ND 58108-6050. Seed of this release will also be deposited in the USDA National


Office of the Administrator
Jamie L. Whitten Federal Building, Room 302-A
1400 Independence Avenue, SW.
Washington, D.C. 20250

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Plant Germplasm System, where it will be available for research purposes, including development and commercialization of new cultivars. U.S. Plant Variety Protection will not be pursued for HA-DM5.

ARS GIVES NO WARRANTIES OR GUARANTEES, EXPRESSED OR IMPLIED FOR THE MATERIAL, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Signatures:



Vice President for Agricultural Affairs
North Dakota State University

5/30/17
Date



Deputy Administrator, Crop Production and Protection
Agricultural Research Service, U.S. Department of Agriculture

6/13/17
Date