



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 STATE UNIVERSITY  
FARGO, ND

**NOTICE OF RELEASE OF HA-DM7, OILSEED SUNFLOWER**

Downy mildew caused by *Plasmopara halstedii* is a yield-limiting disease that occurs in all areas of intensive sunflower production throughout the world. New downy mildew resistance genes are continually needed as new virulent races evolve.

HA-DM7 is a BC2F3-derived BC2F4 oilseed maintainer selection from the cross of HA 89\*2/NMS HA 89/*Helianthus argophyllus* accession PI 494578. HA 89 (PI 599773) is an inbred maintainer line susceptible to downy mildew (caused by *Plasmopara halstedii*) released by USDA and the Texas Agricultural Experiment Station in 1971. The nuclear male sterile (NMS) HA 89 (PI 559477) induced by streptomycin treatment of HA 89 possesses a single recessive *ms9* male sterility gene released by the USDA and the North Dakota Agricultural Experiment Station, Fargo, ND in 1990. The *H. argophyllus* accession (PI 494578) was originally collected in Texas in 1984 and is resistant to new virulent races of downy mildew. HA-DM7 was developed by the backcross breeding method and DNA marker-assisted selection for the PI20 downy mildew resistance gene introgressed from wild *H. argophyllus* (PI 494578). The cross between NMS HA 89 and PI 494578 was made in 2012 and the selected resistant F1 plants were backcrossed twice to HA 89. The BC2F3-derived HA-DM7 is homozygous for the PI20 gene verified by DNA markers and greenhouse downy mildew screening. HA-DM7 is immune to the most predominant and virulent races of downy mildew currently identified in the United States and Europe. Plant height of HA-DM7 was 149 cm compared to 121 cm for HA 89 and flowers 75 days after planting compared to 65 days for HA 89 in the field nursery at Glyndon, MN during the summer of 2017.

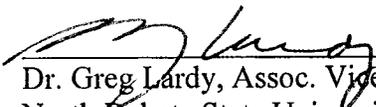
Small quantities of seed of the HA-DM7 germplasm will be available from the North Dakota Foundation Seedstocks Project, Department of Plant Sciences, NDSU Dep. 7670, P.O. Box 6050, Fargo, ND 58108-6050. Seed of this release will also be deposited in the USDA National Plant Germplasm System, where it will be available for research purposes, including

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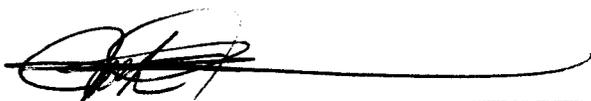
development and commercialization of new cultivars. U.S. Plant Variety Protection will not be pursued for HA-DM7.

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

Signatures:

  
\_\_\_\_\_  
Dr. Greg Lardy, Assoc. Vice President for Agricultural Affairs  
North Dakota State University

6/18/19  
Date

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

7/17/2019  
Date