



United States Department of Agriculture

Research, Education, and Economics  
Agricultural Research Service

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

**NOTICE OF RELEASE OF HA-DM8 OILSEED SUNFLOWER**

Downy mildew (DM) caused by the obligate pathogen *Plasmopara halstedii* is an economically important and widespread disease of sunflower worldwide. Use of the plant's natural resistance is the most economical and sustainable strategy to prevent crop losses. The discovery of novel DM resistance gene is a long-term task due to the frequent changes of the DM pathogen populations reducing the effectiveness of resistance genes in cultivated sunflower. HA-DM8 was developed by introducing a new DM resistance gene from wild sunflower species into cultivated sunflower, providing a new source for use in sunflower breeding programs.

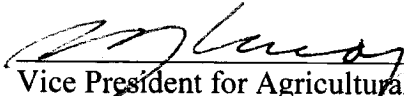
HA-DM8 is a BC2F5-derived BC2F6 oil-type maintainer selection from the cross of HA 89\*2//NMS HA 89/*Helianthus argophyllus* accession PI 494576. HA 89 (PI 599773) is an oilseed maintainer line susceptible to DM released by USDA and the Texas Agricultural Experiment Station in 1971, while the nuclear male sterile (NMS) HA 89 (PI 559477) is a mutation of HA 89 released as an NMS genetic stock. The wild annual *Helianthus argophyllus* accession (PI 494576) originally collected in Texas in 1984 was identified as resistant to the most virulent DM race 777 in 2005. HA-DM8 was developed using the backcross breeding method and DNA marker-assisted selection for the P135 DM resistance gene introgressed from wild *H. argophyllus* accession PI 494576. The cross between NMS HA 89 and PI 494576 was initially made in 2012 and the selected resistant F1 plants were backcrossed twice to HA 89. The BC2F5-derived HA-DM8 is homozygous for the P135 resistance gene verified by DNA markers and greenhouse DM testing. HA-DM8 is immune to the most predominant and virulent DM races currently identified in the United States and Europe. Plant height of HA-DM8 was 109 cm compared to 95 cm for HA 89, and flowers in 90 days after planting compared to 85 days for HA 89 in the field nursery at Glyndon, MN during the summer of 2019.

Small quantities of seed of the HA-DM8 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 development and commercialization of new cultivars. U.S. Plant Variety Protection will not be pursued for HA-DM8.

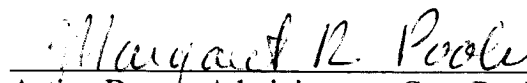
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Signatures:

  
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Vice President for Agricultural Affairs  
North Dakota State University

3/2/2020  
Date

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

3/3/2020  
Date