

UNITED STATES DEPARTMENT OF AGRICULTURE  
Agricultural Research Service  
Washington, D.C.

and

NORTH DAKOTA AGRICULTURAL EXPERIMENT STATION  
Fargo, ND


**NOTICE OF RELEASE OF HA-DM1, OIL SUNFLOWER**

HA-DM1 is a BC2F3-derived BC2F4 maintainer selection from the cross of HA 89\*2/NMS HA 89/Helianthus argophyllus accession PI 494573. 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 male sterility gene *ms9* released by the USDA and the North Dakota Agricultural Experiment Station, Fargo, ND in 1990. The *H. argophyllus* accession PI 494573 was originally collected from Texas in 1984 and is resistant to new, virulent races of downy mildew. HA-DM1 was developed by the backcross breeding method and DNA marker-assisted selection for the downy mildew resistance gene *PI18* introgressed from wild *H. argophyllus* PI 494573. The cross between NMS HA 89 and PI 494573 was made in 2009 and the selected resistant F1 plants was backcrossed twice to HA 89. The BC2F3-derived HA-DM1 is homozygous for the *PI18* gene verified by DNA markers, and immune to all known races of downy mildew. Plant height of HA-DM1 was 102 cm compared to 106 cm for HA 89 and flowered 73 days after planting compared to 69 days for HA 89 in the field nursery at Fargo, ND during the summer of 2013.

**Signatures:**

  
\_\_\_\_\_  
Vice President for Agricultural Affairs  
North Dakota State University

5/26/15  
Date

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

6/2/15  
Date