



United States Department of Agriculture

Research, Education, and Economics
Agricultural Research Service

UNITED STATES DEPARTMENT OF AGRICULTURE
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AND

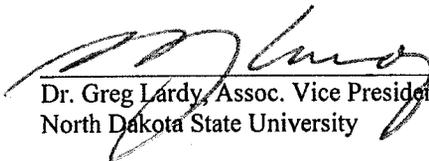
NORTH DAKOTA STATE UNIVERSITY
NORTH DAKOTA AGRICULTURAL EXPERIMENT STATION
FARGO, ND

NOTICE OF RELEASE OF HA-DM6 CONFECTION SUNFLOWER

HA-DM6 is a BC2F3-derived BC2F4 confection maintainer selection from the cross of CONFSC1B1*2/CMS CONFSC1B1/*Helianthus argophyllus* accession PI 494576. CONFSC1B1 is a confection BC2F3-derived BC2F4 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 (caused by *Plasmopara halstedii*). The cytoplasmic male sterile (CMS) CONFSC1B1 was developed by substituting the nuclear genome of CONFSC1B1 into the background of a wild annual species *H. petiolaris* (CMS PET1). The wild annual *Helianthus argophyllus* accession (PI 494576) was originally collected in Texas in 1984 and is resistant to new virulent races of downy mildew. HA-DM6 was developed using the backcross breeding method and DNA marker-assisted selection for the P135 downy mildew resistance gene introgressed from wild *H. argophyllus* accession PI 494576. The cross between CMS CONFSC1B1 and PI 494576 was made in 2012 and the selected resistant F1 plants were backcrossed twice to CONFSC1B1. The BC2F3-derived HA-DM6 is homozygous for the P135 resistance gene verified by DNA markers and greenhouse downy mildew screening. HA-DM6 is immune to the most predominant and virulent races of downy mildew currently identified in the United States and Europe. Plant height of HA-DM6 was 174 cm compared to 178 cm for CONFSC1B1, and flowers in 88 days after planting compared to 81 days for CONFSC1B1 in the field nursery at Glyndon, MN during the summer of 2017.

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

6/10/19
Date



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

7/17/2019
Date

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