

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
WASHINGTON, DC

and

NORTH DAKOTA STATE UNIVERSITY
FARGO, NORTH DAKOTA

NOTICE OF RELEASE OF F1024 SUGARBEET

F1024 was selected from a population formed by crossing F1016, a root maggot resistant line with green hypocotyls, and 961009H2, a *Cercospora* leaf spot (*Cercospora beticola*) resistant breeding line developed by USDA-ARS, Fort Collins, Colorado. The population was formed by allowing plants of F1016 and 961009H2 plants with red hypocotyls to interpollinate at random. Seed was harvested from only the F1016 plants. Forty-nine F1 progeny with red hypocotyls were harvested to provide seed for the F2 generation. The population was subjected to 3 cycles of mass selection. For each cycle, approximately 1000 roots were evaluated. Between 50 and 68 plants with the least amount of visible sugarbeet root maggot damage were selected and allowed to interpollinate to produce seed for the next selection cycle. Selected plants from the third cycle were harvested individually, and the seed from each plant increased as a half-sib family. Forty-eight half-sib families were evaluated in 2005, and 14 were selected for a second cycle of selection in 2007. Ten of the 14 families were evaluated again in 2008, and eight of the ten were selected. Selected plants from these eight families were allowed to interpollinate, and an equal amount of seed from each of the eight lines was combined to form F1024. Roots of F1024 are white, tapered, and un-branched with a relative shallow groove. The roots are larger and longer than those of F1016, its root maggot resistant parent, and F1024 plants are generally larger and more vigorous than those of F1016. The root maggot resistance of F1024 is equal to or slightly better than that of F1016. Very little root maggot feeding is observed on F1024, even at lower depths where maggot damage is often the most prevalent on susceptible genotypes. F1024 has moderate resistance to *Cercospora* leaf spot, a foliar disease of world-wide importance. Testcrosses with susceptible female lines had approximately one percent less sugar, higher root

and recoverable sugar yields, and substantially less root maggot damage than otherwise adapted root maggot susceptible hybrids, when evaluated with no insecticide at sites with root maggot present.

Signatures:



~~Executive~~ Director, North Dakota Agricultural Experiment Station
North Dakota State University

12/4/09
Date



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

12/15/09
Date