

UNITED STATES DEPARTMENT OF AGRICULTURE
Science and Education Administration
and
Agricultural Experiment Station of the
University of Puerto Rico

ANNOUNCE

THE RELEASE OF THE MULTIPLE DISEASE RESISTANT BLACK BEAN CULTIVAR
MITA-76-R287

The Science and Education Administration, Agricultural Research, United States Department of Agriculture, and the Agricultural Experiment Station of the University of Puerto Rico (UPR) announce the release of the Multiple Disease Resistant Black Bean Cultivar MITA-76-R287. This improved cultivar has been developed by a cooperative research program between Mayaguez Institute of Tropical Agriculture (MITA), AR, SR, SEA and the University of Puerto Rico (Project C-457 entitled "Improvement of Tropical Production of Beans and Cowpeas Through Disease and Insect Control") supported in part by the Agency for International Development, Contract AID/ta-C-1296.

A summary of the pedigree and outstanding characteristics of the new cultivar follows:

MITA-76-R287 From a cross between 15R-55 x Mex. 309 (15R-55 is a breeding line released for rust and BCMV resistance in 1974 by Dr. N. Vakili, USDA, Mayaguez, and Mexico-309 is a variety resistant to soil-borne pathogens and immune to rust in P.R.), increased in bulk through F₂, rogued and mass selected through F₄, increased through F₆.

The extraordinary multiple disease resistance of this cultivar throughout the field selection procedures shows an accumulation of major and minor genes for resistance which can be appreciated by the following history of the cultivar formation:

F₁ Fortuna (S. coast of P.R.) 1975.

Semi-vine, medium season, high yield; virus, no infection; common bacterial blight, slightly susceptible; mature plant dead at harvest, roots affected with Fusarium and Macrophomina.

Greenhouse inoculation (MITA) 1977

CFMV, resistant; Xanthomonas phaseoli, resistant; Uromyces appendiculatus segregating 3,20 to 5,80.

F₂ Isabela (N. coast of P.R.) 1976

Thirty-three seeds sown in a soil highly infested with a complex of soil-borne diseases, and dried pods from 33

vigorous plants were harvested; F₂ plants segregated for rust resistance and tolerance.

F₃ Limaní Valley (Western Interior, elevation 500 m) 1977

43 days after sowing

Rust epiphytotic, 73% resistant to 27% susceptible; common bacterial blight, slightly susceptible (5% of foliage affected); cucumber mosaic virus, no symptoms; BCMV (systemic necrosis and systemic mosaic), no symptoms; roots, extensive, disease and nematode free.

88 days

Rust, 87% resistant (1,0), 13% susceptible (5,80); BCMV (systemic necrosis), 87% resistant and 13% susceptible to an epiphytotic of the "black root" disease; rugose virus, no symptoms; angular leaf spot, susceptible (response 4,50); stem anthracnose, 15% infection incidence; powdery mildew, no infection; roots, disease and nematode free.

F₄ Greenhouse inoculation of seedling, Mayaguez 1978

BCMV, systemic mosaic resistant; systemic necrosis, highly susceptible.

F₅ Yield tests

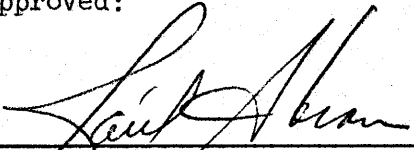
The yield average of trials for 3 locations and without disease control was 1,900 Kg/Ha; rust incidence was slight to moderate depending on locality, seed weight is 21.8 g/100 seed.

Possible explanations for MITA-76-R287's high frequency of mature plant resistance to "black root" in the field (Limaní, 20°C) and the highly susceptible response of its seedling to inoculation with systemic necrosis virus in the greenhouse (Mayaguez, 26.5°C) are: a) a high temperature threshold, b) non-preference by vectors, and c) mature plant resistance.

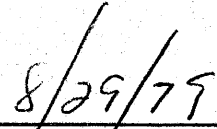
MITA-76-R287 is suggested as a parental source for multiple disease resistance or as a commercial cultivar in regions where black beans are preferred.

Limited amounts of seed are available on a pro-rata basis to qualified persons who request it in writing from Mayaguez Institute of Tropical Agriculture, AR, SR, SEA, P. O. Box 70, Mayaguez, Puerto Rico 00708.

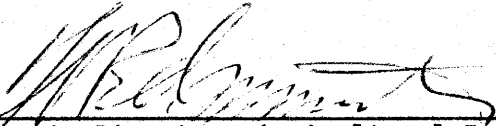
Approved:



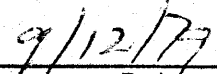
Director, Agricultural Experiment Station
University of Puerto Rico



Date



Deputy Director, Agricultural Research
Science and Education Administration
United States Department of Agriculture



Date