

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

NOTICE TO PLANT BREEDERS OF RELEASE OF MULTIPLE
DISEASE RESISTANT SCARLET RUNNER BEAN
GERM PLASM

The Agricultural Research, Science and Education Administration, United States Department of Agriculture, and the Agricultural Experiment Station of the University of Puerto Rico announce the release of the multiple disease resistant scarlet runner bean (Phaseolus coccineus (L.) subsp. coccineus Maréchal) germ plasm.

The development of this germ plasm was carried out with partial support from the Agency for International Development under a contract (AID/CM/TA-C-63-26) entitled "Improvement of Tropical Production of Beans and Cowpeas Through Disease and Insect Control."

The multiple disease resistant (MDR) scarlet runner bean (RB) was developed for interspecific hybridization with dry bean (P. vulgaris L.) and for the explicit purpose of incorporating bacterial blight and rust resistance into the latter species.

The MDR germ plasm was developed by subjecting the P.I. accessions of RB to cross-pollination by Carpenter bees (Xylocopa brasiliatorum L.), while at the same time applying prolonged field epiphytotics. Susceptible plants were eliminated and selected survivors were allowed to cross-pollinate. Seedlings of these selected plants were challenged in the greenhouse with virus and bacterial diseases, and the selected ones formed the next field population that was subjected to epiphytotics and selection. From each plant with widest resistance 10 seedlings were selected and screened in the greenhouse and then planted in an isolated field location. Plants with highest resistance and survivability were selected. Their seed will be released as MDR germ plasm.

The MDR trials with RB started in November, 1974. Each recurrent selection population was done in 18 months. Field trials were conducted at Limaní, in the Western Interior, at 500 m elevation and at Mayaguez, at sea level, and greenhouse inoculations were done at Mayaguez.

Resistance to the following diseases was a common characteristic of the selected plants: 1) Soil-borne disease complex including: Sclerotium rolfsii Sacc., Rhizoctonia solani Kuehn, Macrophomina phaseoli (Maubl.) Ashby, and Fusarium solani (Mart.) Appel & Wr.; 2) Bean rust, Uromyces appendiculata (Pers.) Unger; 3) Angular leaf spot, Isariopsis griseola Sacc.; 4) Powdery mildew, Erysiphe polygoni DC.; 5) Cercospora leaf spot, Cercospora sp.; 6) Bacterial blight, Xanthomonas phaseoli (E. F. Sm.) Dows.; 7) Cowpea mosaic virus; and 8) Bean common mosaic virus (Systemic mosaic and systemic necrosis).

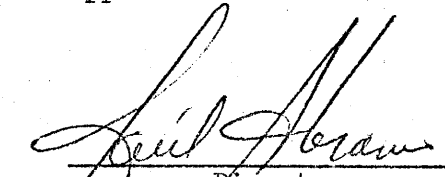
The following table gives the P.I. origin, MITA selection number and responses of selections for resistance to four other pathogens.

Release Number	P.I. Origin	MITA Recurrent Selection Number	Response to Diseases ^{1/}		
			SBR	Anth.	2 Leaf Spots
1	165421	Pc-H-10-1-5	S	R	MS
2	201300	Pc-H-23-1-1	MS	MS	R
3	201312	Pc-H-27-3-2	S	S	MS
4	209669	Pc-H-35-2-1	MR	MR	R
5		-2-4	HS	MS	R
6		-2-9	HS	MS	MS
7	273667	Pc-H-46-1-4	R	MS	R
8		-1-6	R	MS	R
9		-1-7	R	R	MS
10	201299	Pc-H-73-2-9	S	R	R
11	311950	Pc-H-88-1-2	MS	MS	S


1/ SBR = Soybean rust, Phakopsora pachyrhizi Sydow; Anth.= stem Anthracnose, Colletotricum lindemuthiarum Briosi & Cav.; Leaf spot = two very similar symptoms caused by Diaporthe sojae Lehman and Ascochyta phaseolorum Sacc.

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

Approved:


 Director
 Agricultural Experiment
 Station
 University of Puerto Rico

6/6/79
 Date


 Acting Deputy Director
 Agricultural Research
 Science and Education Administration

6/19/79
 Date