

UNITED STATES DEPARTMENT OF AGRICULTURE

Science and Education Administration

and

Agricultural Experiment Station of the

University of Puerto Rico

ANNOUNCE

NAMING AND RELEASE OF THE MULTIPLE DISEASE RESISTANT
CULTIVAR "CARBÓN"

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 cultivar 'Carbón'.

A portion of the project carried out by USDA and UPR is supported in part by 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."

Carbón was developed through an integrated scheme of multiple disease resistance screening and recurrent selection population breeding. A single hybrid plant from P.I. 180760, a mottled dry bean (Phaseolus vulgaris L.) from Germany, was selected for root rot and rust resistance, lush foliage throughout its growth, and black shiny seed.

In 1971 the F₂ progenies of the hybrid 71-2B-R65 were screened for rhynchosia mosaic virus (RMV), golden yellow mosaic virus (GYMV), rust (Uromyces appendiculata), and rhizoctonia root rot (Rhizoctonia solani). During the screening, carpenter bees (Xylocopa brasiliatorum L.) visited flowers, causing an average of 12.5 cross-pollinations in the plot. Until 1974, the hybrid progenies were included in recurrent selection populations under different field numbers. In a 1974 trial, it was selected for its multiple disease resistance as 536-1BK-3BK. In 1975 it was placed in multi-location disease resistance and yield tests, and in 1976, it was included in yield trials at Fortuna, Isabela and Limaní. During 1977-78 it was increased and selected for seed uniformity.

Carbón has black shiny and dull seeds weighing 22.4 g per 100. It has a pod length of 11.4 cm, which is straight, and bears 6.9 seeds. It had the highest yield among 25 tropical dry bean cultivars, producing 2,674 Kg/Ha at Fortuna yield trial in 1976. Carbón is a very vigorous plant with semi-vine habit at sea level and determinate vine habit at 500 m elevation. It flowers at 30 days and has dry pods 70 days after sowing at sea level; at 500 m elevation it flowers at 40 days and pods begin to dry at 85 days after sowing. It retained 64% green plant stand at harvest with 80% normal foliage.

Carbón is highly resistant to soil-borne diseases, having a high percentage of emergence and retaining a solid stand during its growth. Its extensive root system has been free from rhizoctonia root rot, fusarium root rot (Fusarium solani), charcoal rot (Macrophomina phaseoli) and southern blight (Sclerotium rolfsii). Its roots were free from

Meloidogyne incognita lesions at two root knot nematode trials. It is highly tolerant to Xanthomonas strains causing common bacterial blight and bacterial canker of cowpeas. In greenhouse inoculations it was moderately susceptible to the former disease and slightly susceptible to the latter bacterial disease. It is resistant to rust, having 1,0 to 2,20 responses in various trials. It is resistant to systemic mosaic strain of bean common mosaic virus (BCMV) and is moderately susceptible to greenhouse inoculation of cucumber mosaic virus (CMV). It has field resistance to CMV and cowpea mosaic virus.

Carbón is susceptible to angular leaf spot (Isariopsis griseola) and cercospora pod blotch (Cercospora canescens). It is tolerant to leafhopper (Empoasca Kraemeri) infestation.

Carbón is suggested for adaptability trials at locations where black beans have consumer acceptance. It is an excellent candidate as parental material for disease resistance.

Limited amount of seed is available on a pro-rata basis to qualified persons who request it in writing on or before June 30, 1979 from N. G. Vakili, Mayaguez Institute of Tropical Agriculture, AR, SR, SEA, P. O. Box 70, Mayaguez, Puerto Rico 00708.

Approved:

Director
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Date

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Date