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 "CARBON".

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 brasilianorum 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 2.0 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 kraemerii) 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, SBA, P. O. Box 70, Mayaguez, Puerto Rico 00708.

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