Registration of ‘Carrizalito’ Small Red Bean

Small red dry bean (Phaseolus vulgaris L.) ‘Carrizalito’ (Reg. no. CV-247, PI 639174) was developed at the Escuela Agrícola Panamericana (EAP), Zamorano, Honduras, and released for Honduras in 2003 and Costa Rica in 2004, in collaboration with the National Bean Programs of Honduras and Costa Rica, and the University of Puerto Rico. Carrizalito is a high yielding, disease resistant cultivar, adapted to the midaltitude (800–1200 m asl) bean production regions of Central America.

Carrizalito was an F2:6 derived line from the cross ‘Tio Canela 75’/DICTA 105. Tio Canela 75 has small red seed and resistance to Bean golden yellow mosaic virus (BGYMV) (Rosas et al., 1997). DICTA 105 is a bean pod weevil (Trichapion godmani) resistant small red breeding line from the Centro Internacional de Agricultura Tropical (CIAT), Cali, Colombia, and the Dirección de Ciencia y Tecnología Agropecuaria (DICTA), Tegucigalpa, Honduras. Carrizalito is a sister line of the small red bean cultivar ‘Amadeus 77’ released for Central America in 2003 (Rosas et al., 2004).

The F1 was grown in a screen house. Individual F2 plants were selected in the field at Zamorano for upright architecture and early maturity (≤70 d). The F2 to F6 families were evaluated during 1996 to 1998 for agronomic traits as well as for resistance to natural incidence of Bean common mosaic virus (BCMV), anthracnose [caused by Colletotrichum lindemuthianum (Sacc. & Magnus) Lams.-Scrib.], angular leaf spot [caused by Phaeosariopsis griseola (Sacc.) Ferraris], and web blight [caused by Thanatephorus cucumeris (Frank) Donk.]. Artificial inoculations with local isolates of the common bacterial blight (CBB) pathogen Xanthomonas campestris pv. phaseoli (Smith) Dye and with rust [caused by Uromyces appendiculatus (Pers.;Pers.) Unger] spores collected from infected bean fields were also performed to evaluate resistance. F5 families were screened under drought stress (~180 mm water was applied during the growing season), using sprinkler irrigation in 1997; and selected F6 families were evaluated under natural incidence of BGMYV at Comayagua from October to December 1997. Plants within BGMYV resistant families were harvested in bulk. Selection for commercial small red seed type was practiced in every generation.

In 2004, Carrizalito was mechanically inoculated at the University of Puerto Rico (UPR) with the NL3 strain of Bean common mosaic necrotic virus (BCMNV) and found to have top necrosis caused by the presence of the dominant I gene for resistance to BCMV. Ashy stem blight is favored by warm dry conditions associated with drought stress (Mayek-Pérez et al., 2002). Seedlings of Carrizalito were inoculated in the greenhouse at the UPR with the ash stem blight pathogen Macrophomina phaseolina (Tassi) Goid. and found to be resistant (M. Alameda-Lozada, personal communication, 2004).

In 1999, the average yield of Carrizalito across 17 locations in the Central American and Caribbean Regional Yield and Adaptation Trial (ECAR) was 2259 kg ha−1 compared to 1803 kg ha−1 for the local check and 1741 kg ha−1 for the elite check ‘Dorado’. In 2000, the average yield of Carrizalito across landraces for resistance to anthracnose, a BGMYV, CBB and rust.

In 40 yield trials in Costa Rica, conducted in 2002 in diverse bean production areas, from sea level to 960 m asl at Puriscal, Carrizalito produced an average of 1098 kg ha−1 compared to 885 kg ha−1 for ‘Bonito’ (Rosas et al., 2003) and 1007 kg ha−1 for the local check ‘Bribri’ and the local check ‘Corralejo’ in these trials, respectively. The experimental mean of Carrizalito was 1090 kg ha−1 with a maximum of 1516 kg ha−1. Under conventional production practices, trials, Carrizalito produced an average yield of 1062 kg ha−1.

Carrizalito has an indeterminate upright habit with a short vine. Carrizalito flowers from terminal buds matures in 68 to 70 d. Stem color is green with brown striation. Green pods turn yellow with red pigmentation. Carrizalito has pod containing one seed per pod. Carrizalito has an indeterminate, yellow, non-seed. It has a shiny red seed coat color that is commercially acceptable in Honduras, Costa Rica, and other Central American countries.

Small quantities of Breeder seed of Carrizalito may be obtained from the corresponding author. Plant variety protection will not be sought for this cultivar.

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Acknowledgments

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References


Rosas, J.C., J.C. Hernández, and R. Araya. 2003. ‘Bribri’ small red bean (race Mesoamerica). Carrizalito has an indeterminate upright habit with a short vine. Carrizalito flowers from terminal buds matures in 68 to 70 d. Stem color is green with brown striation. Green pods turn yellow with red pigmentation. Carrizalito has pod containing one seed per pod. Carrizalito has an indeterminate, yellow, non-seed. It has a shiny red seed coat color that is commercially acceptable in Honduras, Costa Rica, and other Central American countries.

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