REGISTRATION OF 'BOND' RICE

'BOND' RICE (Oryza sativa L.) (Reg. no. 63) PI 474579 (PI denotes Plant Inventory number in the USDA-ARS Small Grains World Collection), a short-statured, very short season, long-grain cultivar, was developed jointly by the USDA-ARS and the Arkansas Agricultural Experiment Station. It was officially released 4 Jan. 1985. During the 5 years prior to its release, Bond was widely tested in Arkansas and other rice-growing states under the designations RU7801077 (RU number indicates Regional Uniform Rice Nursery; 78 indicates year entered from Stuttgart, Ark. (A) as entry number 077.) and RU8101007.

Bond was derived from the cross 'Vegold'/CI9556// 'Dawn'/9// 'Starbonnet'/Taducan (Cross no. 73SF8) made at Stuttgart in 1973. The long-grained Vegold has been described by Johnston and Adair (1965). CI9556 was a true-breeding, long-grain line from the cross CI9453/CI9187. CI9453 is a medium-grain sister selection of 'Nova' (Johnston et al., 1965).

CI9187 is a high-yielding, long-grain selection which was also in the parentage of 'Bonnet 73' (Johnston et al., 1973). Dawn, a blast-resistant, long-grain cultivar which has been widely used in crosses, was described by Bollich et al. (1968). The Vegold/9556//Dawn parent was a rather large-seeded, true-breeding, long-grain line designated STG69228. Starbonnet, one of the two most extensively grown long-grain cultivars in the United States, was described by Johnston et al. (1968). Taducan (PI280681) has been widely used in crosses throughout the world because of its resistance to many races of the blast disease organism. The Starbonnet/Taducan parent was a uniform-appearing, short-statured, long-grain line designated STG73L600. Bond was first tested under the designation STG755615, indicating that it was first bulk harvested from the 1975 Stuttgart F2 row number 5615. Some information on Bond has previously been reported by Johnston et al. (1983) and by Huey (1983).

In 1980, about 100 panicle rows each of a total of 50 family blocks were grown preliminary to the production of breeder seed. The seed designated RU8101007 consisted of a composite bulk of the seed from seven of the above family blocks which appeared very uniform, were similar in plant type, and which had the largest seed size over a 2-year period. A breeder seed increase from this composite grown at Stuttgart in 1981 was used to seed the 24 hectares grown in 1982 at the University of Arkansas Rice Research and Extension Center at Stuttgart to produce the foundation seed of Bond released to qualified seed growers for 1983 production.

Bond is a long-grain cultivar with the same maturity as the widely grown 'Labelle' (Bollich et al., 1973), coupled or bonded with the large kernel size of 'Lebonnet' (Bollich et al., 1975) that is favored for parboiling. When seeded about 1 May in Arkansas tests, Bond and Labelle averaged 83 days from seeding to 50% heading. When relative maturity is reported in degree-day (DD50) units from varying dates of seeding (B.R. Wells and B.A. Huey, unpublished), Labelle and Bond averaged 1770 and 1800 units, respectively, from emergence to 50% heading. The DD50 computerized program has been described by Huey and Boston (1983).

Compared to Labelle in Arkansas, Bond averaged 13 cm (5 inches) shorter in plant height and showed greater resistance to lodging. Individual kernel weights of brown rice averaged 20.3 mg for Bond and 17.1 mg for Labelle. In 33 Arkansas tests, Bond averaged about 6150 kg ha⁻¹ in grain (rough rice) yields, exceeding Labelle by about 10%. As an average of 12 June-seeded Arkansas tests, Bond produced 19% higher grain yields than Labelle. Therefore, Bond should be highly desirable for late seeding or following wheat in a double-crop culture.

In several cooperative N-fertilizer tests conducted in Arkansas by B.R. Wells (unpublished data), Bond has performed well. From experiments in Louisiana, Brandon et al. (1981, 1982) report that Bond showed significantly better seedling vigor than Labelle. Bond showed superiority over Labelle in first crop grain yields in an experiment involving nine N-fertilizer treatments. As an average, Bond produced 7029 kg ha⁻¹ of rough rice compared to 6276 kg ha⁻¹ for Labelle. The maximum grain yield from a single treatment averaged 8340 kg ha⁻¹ for Bond and 7305 kg ha⁻¹ for Labelle. As an average of several Mississippi tests, Bond produced 17% higher grain yields than Labelle (Milam and Bradshaw, 1983).

Plants of Bond have a more erect growth habit and tillers much more profusely than those of Labelle. Bond has glabrous (smooth) lemma, palea, and leaf blades and typically plants have purple apical and stigmas and straw-colored hulls. A few tall plants and an occasional gold-hulled off-type plant may be found in Bond. Kernels of Bond have light brown bran (pericarp) and are usually clear (nonchalky). The endosperm is nonglutinous and nonaromatic. Results from the Cooperative Regional Rice Quality Laboratory at Beaumont, Tex. (B.D. Webb, unpublished) indicate that Bond has cooking and processing quality characteristics typical of U.S. long-grain cultivars as described by Webb et al. (1972).

The whole kernel (head rice) milling yields of Bond averaged 3 to 4 percentage points less than those of Labelle, but the added grain yield of Bond resulted in an average of 5 to 10% greater per-acre value of milled rice than from Labelle in Arkansas tests.

Individual grain and kernel dimensions for Bond, Labelle, and Lebonnet, respectively, averaged as follows: for rough rice length - 9.6, 9.3, and 10.0 mm; width - 2.6, 2.5, and 2.6; length/width ratio - 3.7, 3.8, and 3.9; and thickness - 2.0, 1.9, and 2.0. Corresponding measurements for brown rice averaged: length - 7.6, 7.2, and 7.8; width - 2.5, 2.1, and 2.2; length/width ratio - 3.4, 3.4, and 3.5; and thickness - 1.7, 1.6, and 1.7. For whole-grain milled rice the averages were: length - 7.4, 7.0, and 7.4; width - 2.1, 2.0, and 2.1; length/width ratio - 3.5, 3.5, and 3.5; and thickness - 1.64, 1.59, and 1.66.

Bond is very similar to Labelle in reaction to common rice diseases.

Breeder and foundation seed of Bond will be maintained by the Univ. of Arkansas Rice Res. and Ext. Ctr., P. O. Box 351, Stuttgart, AR 72160.

Plans are being made to submit application for registration and variety protection of Bond under P.L. 91-577 within the certification option.


References and Notes


