Registration of ‘Barimasur-4’ Lentil

‘Barimasur-4’ lentil (Lens culinaris Medikus) (Reg. no. CV-8, PI 605356) was developed at the Pulses Research Centre (PRC), Bangladesh Agricultural Research Institute (BARI), Joynalpur, Gazipur, Bangladesh. The cultivar was released in Bangladesh in 1995 for stable and high yield with combined resistance to rust [caused by Uromyces fabae (Pers.) de Bary; Pucciniaceae, Uredinales] and stemphylium blight (caused by Stemphylium botryosum Wallr.; Dematiaceae, Hyphales).

‘Barimasur-4’ was developed from the cross ILL 5888/FLIP 84-112 L (ILL 5782) made at the International Center for Agricultural Research in the Dry Areas (ICARDA), at Aleppo, Syria, specifically for Bangladesh. The female parent (ILL 5888) was an improved lentil cultivar developed through pure-line selection from a landrace in Bangladesh. The segregating F1 bulk population was sent to Bangladesh in 1987–1988. Single-plant selection was done in the F2 generation at Ishurdi, Bangladesh. A total of 57 F2 families were developed from this particular cross, and evaluated in plant-progeny rows in 1988–1989 at Ishurdi, and 29 F2 families were selected and tested as F3 families the following year. In the F3 generation, 10 families were retained as promising and were evaluated as F4 lines. Maturity duration, disease reaction, growth habit, podding intensity, and seed yield were given priority during selection. Thus, 10 F4 lines were evaluated in a replicated trial in 1990–1991 and seeds were bulked. The bulked line was assigned the station identification number ILX 87247. This line was evaluated in preliminary, advanced, and regional yield trials from 1991–1992 to 1993–1994 at four locations.

Yield trials over 3 yr across four lentil growing regions in Bangladesh showed that Barimasur-4 produced a mean seed yield of 2300 kg ha⁻¹, compared with 1800 kg ha⁻¹ for the Barimasur-2 check. (1) Barimasur-4 has a 28% yield advantage over Barimasur-2 and a 53% advantage over the standard check, ‘Ulfana’, and gave consistently higher yields throughout the trials. Due to its wide adaptability, the cultivar is recommended for all lentil-growing areas in Bangladesh. Barimasur-4 matures in 116 d, which is about 1 wk later than indigenous landraces; however, this does not hamper the existing cropping pattern.

Barimasur-4 is an erect, medium-statured (40–42 cm) cultivar with long fruiting branches. Anthocyanin pigmentation is present on the stems. The leaves are light green, with narrow leaflets and with a rudimentary tendril. The flower color is blue, and the pods, leaves, and stems turn a light-straw color at maturity. Most leaflets are shed at 100% pod maturity. Seed color is reddish-gray, dotted; cotyledon color is light-orange. Barimasur-4 has a 100-seed weight of about 1.7 g.

Barimasur-4 has high resistance to lentil rust and stemphylium blight. During initial evaluation, the families or lines were screened for combined resistance using the spreader-row technique (3). Highly susceptible lines for rust (BLL 81149) and stemphylium blight (BLL 81124) were planted after every five families or lines to create artificial disease pressure. Barimasur-4 rated 1 on a 1-to-5 rating scale for both diseases throughout its evaluation across locations.

Seeds of the cultivar have 89% kernel content, but produce 78% head dhal (intact kernel after splitting) using the traditional method of dehulling. It takes about 17 min to cook and shows solid dispersion of 54%. Barimasur-4 contains 28.5% protein and 48% carbohydrate (2).

Mixed cropping and intercropping are popular practices for lentil cultivation in Bangladesh. The most important agronomic advantage of this cultivar is that, having an erect growth habit, more plants can be accommodated per unit area. Barimasur-4 is a potential cultivar for intercropping with sugarcane (Saccharum spp.) and mixed cropping with mustard (Brassica sp.).

Registration of ‘Frontier’ Pinto Bean

‘Frontier’ pinto bean (Phaseolus vulgaris L.) (Reg. no. CV-162, PI 603041) was developed by the North Dakota Agric. Exp. Stn. and released 1 July 1997. Frontier, tested as 88-019-10-02, was derived from the cross PX-057/’Sierra’. PX-057 was an F2 selection from the cross 83-003-A/244/842/83B229/3/5383. 83-003-A was an F2 line from the cross ‘Fiesta’/’Black Magic’, selected for very erect plant growth habit and pinto seed type, 83B229 is a germplasm release from the University of Idaho (1). Lines 4-842 and 5-383 were pinto bean breeding lines developed for resistance to rust [caused by Uromyces appendiculatus (Pers.:Pers.) Unger]. Line 88-019-10-02 was first selected from an F5 population grown at Hatton, ND, in 1989 and advanced one generation in Puerto Rico in the 1989–1990 winter nursery. Final single-plant selections were made on F5₂ evaluation rows grown in the field at Hatton in 1990, with preliminary yield tests of F6₁ lines beginning in 1991.

Frontier was tested for 6 yr (1991–1996) in 21 test sites in North Dakota and other bean growing regions of the USA as an entry in the Midwest Regional Performance Nursery (2). In these environments, the seed yield of Frontier was 34.8% higher than the commercial pinto cultivar Othello. At 14 environments in 1995 and 1996 in North Dakota, Frontier yielded 5.6% more than the late maturing, high-yielding cultivar Chase and 11.3% more than the high-yielding midseason cultivar Maverick.

In North Dakota, Frontier is a full-season dry bean, requiring about 102 d after planting to reach harvestable maturity. This is 6 d earlier than Sierr, but 3 d later than Chase and 7 d later than Othello. Frontier has an erect, floppy plant architecture (Type 1b), with pods well distributed throughout the plant profile. Plant height and architecture are similar to Sierra.

Frontier is homozygous dominant for the Ur-3 rust resistance gene, which confers resistance to the prevalent races of bean rust in North Dakota and surrounding regions. Frontier carries the recessive resistance allele bc-1f² for resistance to Pathogroups I, II, III, and V of bean common mosaic virus. Reaction to the white mold pathogen [Sclerotinia sclerotiorum (Lib.) de Bary] is similar to that of other commercial pinto cultivars when tested in controlled conditions (3), but may avoid some of the disease in field conditions because of its erect growth habit.

The seed of Frontier has traditional pinto size, shape, and coloration. Seeds are moderately large, with a mean weight of 38.9 g 100 seed⁻¹, compared with 33.5 g 100 seed⁻¹ for Sierra. In canning tests at the North Dakota State University Bean Quality Laboratory, Frontier was rated as average, with good appearance.