

## Registration of 'L-204' Rice

'L-204' is a long-grain rice (*Oryza sativa* L.) (Reg. no. CV-105, PI 592739) developed by the California Cooperative Rice Research Foundation, Inc. (CCRRF) at the Rice Experiment Station, Biggs, CA. It was designated experimentally as 92-Y-93 and released jointly by the CCRRF, the California Agricultural Experiment Station, and the USDA-ARS on 1 Apr. 1996. L-204 is a pure line selection from the cross R12664 made in 1986. The pedigree is 'Lemont'//Tainung-sen-yu 2414/'L-201'. Lemont (1) is an early maturing, semidwarf long-grain cultivar developed by the USDA-ARS at the Rice Research Station, Beaumont, TX.

Tainung-sen-yu 2414 (3) is a semidwarf long-grain line selected by the Taiwan Agricultural Research Institute from IR-5470, which was introduced from the International Rice Research Institute. L-201 (4) is an intermediate height long-grain cultivar developed and released by CCRRF in 1979.

L-204 was compared with commercial cultivars L-202 (5) and L-203 (6) in multilocation yield trials conducted by the University of California Cooperative Extension from 1992 to 1995. L-204 is a photoperiod insensitive, early maturing, semidwarf long-grain cultivar. It has glabrous leaves and spikelets. Some hairs are present on the lemma and palea keels. The spikelet is awnless, and straw-colored with red apiculus. The stigma is purple. Leaves are darker green than L-202 and L-203.

L-204 is about 2 and 5 d earlier than L-203 and L-202, respectively, reaching 50% heading in about 88 d. It averages 85 cm in height and is about 4 cm taller than L-202 and L-203. The seedling vigor of L-204 is similar to L-203 but slightly better than L-202. Seedling vigor visual scores for L-204, L-203, and L-202 were 4.2, 4.2, and 3.8, respectively (where 1 = poor and 5 = excellent). L-204 is tolerant of thiobencarb and molinate herbicides in the seedling stage. L-204 showed no significant difference from L-202 and L-203 in reaction to stem rot (caused by *Sclerotium oryzae* Catt.) and aggregate sheath spot (caused by *Rhizoctonia oryzae-sativae* [Saw.] Mordue) diseases. The stem rot disease ratings (scale of 0 to 10, where 0 = no symptoms and 10 = stem completely penetrated) (2) were 6.6, 6.7, and 6.3 for L-204, L-202, and L-203, respectively, and aggregate sheath spot ratings (number of dead leaves on the uppermost four nodes) were 2.4, 2.5, and 2.6. L-204 appears to be slightly more susceptible to cool temperature-induced sterility than L-202 and L-203.

L-204 has shown significantly higher yield potential than L-202 and a yield potential equal to L-203. Average yield at 120 g kg<sup>-1</sup> (12%) grain moisture in the 20 tests conducted from 1992 to 1995 were 10332 kg ha<sup>-1</sup> for L-204, compared with 9559 and 10 070 kg ha<sup>-1</sup> for L-202 and L-203, respectively. L-204 grain weight is similar to L-203 and about 10% heavier than L-202. Brown rice kernels of L-204 in 1995 were 25.6 mg in weight, 8.1 mm in length, and 2.4 mm in width, compared with 22.3 mg, 7.9 mm and 2.2 mm for L-202 and 25.0 mg, 8.0 mm, and 2.4 mm for L-203, respectively. The L-204 kernel has a light brown pericarp, colorless, nonglutinous, nonaromatic endosperm. L-204 has an apparent amylose content of 233 g kg<sup>-1</sup> (23.3%) and an intermediate gelatinization temperature (70–75°C), as indicated by spreading values of 3 to 5 in 17 g kg<sup>-1</sup> KOH solution. The amylose content is about 2% lower than L-202 (24.9%) and L-203 (25.0%). Amylose content and alkali spreading values were determined by USDA-ARS Rice Research Unit, Beaumont, TX. L-204 has an amylographic profile distinctly different from L-202 and L-203. Viscosities from a Rapid Visco Analyser characterization were (peak-hot paste-cool paste) 190–91–196, 131–58–155, and 126–59–155 for L-204, L-202, and L-203, respectively. Head rice milling yield of L-204, L-202, and L-203 from samples harvested sequentially at grain moisture contents ranging from 220 to 150 g kg<sup>-1</sup> (22 to 15%) over 3 yr averaged 577, 520, and 470 g kg<sup>-1</sup> (57.7, 52.0, and 47.0%), respectively.

L-204 was approved for certification by the California Crop Improvement Association in 1996. The initial foundation seed field

contained some slightly taller and later offtypes (<0.00001%) that were rogued. The rogued offtype plants appeared to be from outcrossing to medium and short-grain varieties. Classes of seed will be breeder, foundation, registered, and certified. Application is being made for L-204 under the U.S. Plant Variety Protection Act, Title V option. Breeder and foundation seed classes of L-204 will be maintained by the California Cooperative Rice Research Foundation, Inc., Biggs, CA.

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## Registration of 'A-201' Rice

'A-201' is an aromatic long-grain rice (*Oryza sativa* L.) (Reg. no. CV-106, PI 592740), developed by the California Cooperative Rice Research Foundation, Inc. (CCRRF) at the Rice Experiment Station, Biggs, CA. It was designated experimentally as 91-Y-631 and released jointly by the CCRRF, the California Agricultural Experiment Station, and the USDA-ARS on 1 Apr. 1996. A-201 originated from the cross R10435 made in 1984. The pedigree is 'L-202'//PI 457920//L-202. An F<sub>1</sub> plant was used for backcrossing to L-202. L-202 (2) is an early maturing, semidwarf, long-grain cultivar developed and released by CCRRF in 1984. PI457920, an introduction from Pakistan, is a semidwarf mutant of 'Basmati 370'.

A-201 was evaluated with commercial cultivars L-202 and 'A-301' (3) in state-wide yield trials conducted by the University of California Cooperative Extension from 1992 to 1995. A-201 is a photoperiod insensitive, early maturing, semidwarf, aromatic long-grain cultivar. It reaches 50% heading in an average of 93 d, which is similar to L-202 and 8 d earlier than A-301, an intermediate maturing aromatic long-grain cultivar. Average plant heights of A-201, L-202, and A-301 were 91, 83, and 85 cm, respectively. A-201 exhibits lodging resistance similar to L-202. A-201 plants have glabrous leaves and spikelets except for a few hairs on the lemma and palea keels. Spikelets are awnless, straw colored, and have red apiculi. Leaf color is similar to L-202 and lighter green than A-301.

A-201 grains are slightly more slender than L-202 and A-301. Brown rice kernels of A-201 average 23.1 mg in weight, 8.0 mm in length, and 2.2 mm in width (compared with 22.3 mg, 7.9 mm, and 2.3 mm for L-202 and 24.7 mg, 8.0 mm, and 2.3 mm for A-301, respectively).

The A-201 kernel has a light brown pericarp and a colorless, nonglutinous aromatic endosperm with apparent amylose content of 259 g kg<sup>-1</sup> (25.9%), compared with 252 g kg<sup>-1</sup> (25.2%) and 232 g kg<sup>-1</sup> (23.2%) for L-202 and A-301, respectively. The starch of A-201 has an intermediate gelatinization temperature, as indicated by spreading values of 3 to 5 in 17 g kg<sup>-1</sup> KOH solution. Amylose content and alkali spreading values were determined by

the USDA-ARS Rice Research Unit at Beaumont, TX. A-201 has an amylographic profile similar to L-202 but distinctly different from A-301. Viscosities from a Rapid Visco Analyser characterization were (peak-hot paste-cool paste) 130–59–157, 131–58–155, and 177–80–175 for A-201, L-202, and A-301, respectively. Head rice yield of A-201, L-202, and A-301 in 1995 averaged 388 (38.8%), 461 (46.1%), and 381 (38.1%) g kg<sup>-1</sup>, respectively. Milling samples were sequentially harvested as moisture content decreased from 230 to 170 g kg<sup>-1</sup> (23 to 17%).

A-201 is tolerant of molinate and thiobencarb herbicides at the seedling stage. Seedling vigor of A-201 is similar to L-202 and superior to A-301. Seedling vigor visual scores for A-201, L-202, and A-301 averaged 4.2, 4.0, and 3.5, respectively (where 1 = poor and 5 = excellent). The superior seedling vigor and earliness of A-201 should make it better adapted to California than A-301. Mean grain yields at 120 g kg<sup>-1</sup> (12%) grain moisture of A-201, L-202, and A-301 in 12 trials were 9889, 9936, and 9911 kg ha<sup>-1</sup>, respectively. A-201 showed no significant difference from A-301 for reaction to stem rot (caused by *Sclerotium oryzae* Catt.) and aggregate sheath spot (caused by *Rhizoctonia oryzae-sativae* [Saw.] Mordue) diseases. The stem rot disease ratings (scale of 0 to 10, where 0 = no symptoms and 10 = stem completely penetrated) (1) were 6.2 and 6.1, and aggregate sheath spot ratings (number of dead leaves on the uppermost four nodes) were 2.3 and 2.2 for A-201 and A-301, respectively. Reaction to rice diseases not prevalent in California is unknown.

A-201 was approved for certification by the California Crop Improvement Association in 1996. The foundation seed field (1.17 ha, 2.9 acres) was rogued of observable offtype plants. Included in the offtype plants were a medium-grain rice similar to M-201 (about 500 plants) and plants that appeared to be outcrosses with medium and short-grain rice (<1 in 50 000 plants). Medium-grain rice similar to M-201 was removed in the seed cleaning process to <1 in 80 000 seeds. Classes of seed will be breeder, foundation, registered, and certified. Application is being made for A-201 under the U.S. Plant Variety Protection Act, Title V option. Breeder and foundation seed classes will be maintained by the California Cooperative Rice Research Foundation, Inc., Biggs, CA.

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### Registration of 'Tío Canela-75' Small Red Bean (Race Mesoamerica)

'Tío Canela-75' small red bean (*Phaseolus vulgaris*) (Reg. no. CV-139, PI 595892) was developed and released by the Escuela Agrícola Panamericana (EAP), Zamorano, Honduras, in June 1996 as a disease-resistant and heat-tolerant cultivar.

Tío Canela-75 was an F<sub>2,6</sub> derived line from the cross DOR483//DOR391/'Pompadour J'. DOR483 and DOR391 are small red bean breeding lines derived from the cross DOR367//DOR364//IN101; Pompadour J is a red mottled landrace collected in the Dominican Republic. DOR364 was released in Honduras as the

cultivar Dorado in 1990. DOR lines mentioned here were selected as resistant to bean golden mosaic virus (BGMV) (1).

The F<sub>1</sub> generation was advanced in a greenhouse. Individual F<sub>2</sub> plants were selected under field conditions at Zamorano for erect plant architecture, early maturity, and commercial small red, race Mesoamerica seed type. The F<sub>3</sub> to F<sub>5</sub> generations were evaluated at Zamorano for the previously mentioned traits, and the best plants from the selected families were harvested in bulk. The selected F<sub>6</sub> families were screened for resistance to BGMV in field trials planted at Isabela, Puerto Rico, and Comayagua, Honduras. The F<sub>6</sub> families were also screened for resistance to common bacterial blight (CBB) [caused by *Xanthomonas campestris* pv. *phaseoli* (Smith) Dye]. The F<sub>6</sub> breeding line coded MD30-75 was highly resistant to BGMV and moderately resistant to CBB.

During 1994 and 1995, Tío Canela-75 was extensively tested for yield, disease resistance, and agronomic traits in field experiments planted on research stations and farms. In National Bean Yield and Adaptation Nurseries (VINAR) conducted over 15 locations in Honduras (2), Tío Canela-75 averaged 2226 kg ha<sup>-1</sup>, which was 17% (323 kg ha<sup>-1</sup>) more than Dorado and 44% (683 kg ha<sup>-1</sup>) more than the farmer check variety. In 22 Varietal Verification (COVA) trials (2), Tío Canela-75 produced an average yield of 1536 kg ha<sup>-1</sup>, whereas Dorado averaged 1487 kg ha<sup>-1</sup> and the farmer check variety produced 1172 kg ha<sup>-1</sup>.

On-farm yield and adaptation trials were conducted throughout Honduras at 49 locations by a network of nongovernmental organizations (NGOs). In these trials, the average yield of Tío Canela-75 was 1200 kg ha<sup>-1</sup>, which was 41% more than the farmer check variety (800 kg ha<sup>-1</sup>). In the COVA and on-farm trials, Tío Canela-75 was superior to Dorado and landrace varieties for resistance to BGMV, CBB, bean rust [caused by *Uromyces appendiculatus* (Pers.:Pers.) Unger], and web blight caused by [*Thanatephorus cucumeris* (A.B. Frank) Donk].

Tío Canela-75 was identified to be one of the most heat-tolerant lines in trials conducted in Nacaome, Honduras, in 1994 and 1995. Results from trials conducted in the northern coastal region of Honduras demonstrated that Tío Canela-75 is better adapted to hot and humid conditions of the lowland tropics than are small red bean landrace varieties. Tío Canela-75 is recommended for the low- and intermediate-altitude (<1200 m) bean production regions of Central America.

Tío Canela-75 has an indeterminate bush, short-vine Type II growth habit. Tío Canela-75 is a midseason line maturing 72 d after planting, which is 7 d earlier than Dorado and 4 d later than 'Desarrural'.

Tío Canela-75 has ovoid seed, averaging 22 g 100 seed<sup>-1</sup>. Dry seed color is a shiny red. Results from surveys conducted with farmers found Tío Canela-75 to have superior commercial value and excellent cooking quality (2).

Breeder seed of Tío Canela-75 will be exclusively produced and maintained by the EAP. Foundation seed will be produced and marketed by both the EAP and the Dirección de Ciencia y Tecnología Agropecuaria (DICTA), Secretaría de Recursos Naturales, Tegucigalpa, Honduras.

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