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Registration of B99 and B100 Inbred Lines of Maize

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Abstract
Inbreds B99 (Reg. no. PL-174, P1 584528) and B100 (Reg. no. PL-175, P1 584529) are yellow dent maize (Zea mays L.) lines developed cooperatively by the Iowa Agriculture and Home Economics Experiment Station and the USDA-ARS. The lines were released 12 May 1993 for their potential value in the production of hybrid seed and as sources of germplasm in pedigree-selection breeding programs.

Disciplines
Agricultural Science | Agronomy and Crop Sciences | Plant Breeding and Genetics

Comments
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REGISTRATION OF GENETIC STOCKS

Registration of VGS 1 and VGS 2 Peanut Genetic Stocks

VGS 1 (Reg. no. GS-4, PI 584770) and VGS 2 (Reg. no. GS-5, PI 584771) peanut (*Arachis hypogaea* L.) genetic stocks were developed and released cooperatively by the USDA-ARS and the Virginia Agricultural Experiment Station in 1994. These genetic stocks were released because of their krinkle-leaf characteristic in combination with large pod size. The krinkle-leaf characteristic is a dominant mutant identified by Hammons (3) in a spanish-type peanut with small pods.

VGS 1 and VGS 2 were developed from single-plant selections in the F_8 generation of material from a natural crossing study (2). Florigiant (1), a large-seeded virginia-type cultivar, was used as the female parent and the krinkle-leaf mutant as the male parent. Subsequent generations through F_{12} have been maintained by bulking seed from several plants. Plants are similar to the krinkle-leaf mutant with an erect growth habit, dark green, crinkled leaves, and flowers on the main stem. However, pods are similar to those of the Florigiant parent with a virginia-type shape, slight constriction and reticulation, and mostly two-seeded. Seed are light pink, with a 100-seed weight of 64 g for VGS 1 and 63 g for VGS 2, compared with 76 g for Florigiant and 27 g for the krinkle. Other market grade factors also indicate that VGS 1 is slightly larger than VGS 2. The percentage of fancy pods (83 vs. 77%) and percentage of extra-large kernels (14 vs. 12%) are higher for VGS 1 than VGS 2. VGS 1 is slightly later in maturity than VGS 2.

Preliminary observations indicate no significant resistance to common diseases or insects. VGS 1 and VGS 2 will give geneticists an additional source of the dominant mutant krinkle-leaf trait for use in genetic studies. They will provide breeders using the pedigreed natural crossing method (4) a large-seeded virginia-type source of the krinkle-leaf mutant. In a breeding program developing large-seeded cultivars, these lines should increase the chance of obtaining useful breeding material when using the pedigreed natural crossing method.

Seed of VGS 1 and VGS 2 will be maintained by the USDA-ARS Southern Regional Plant Introduction Station (SRPIS), Griffin, GA. Small quantities of seed are available to qualified researchers upon written request to Dr. R.N. Pittman, Peanut Curator, USDA-ARS, SRPIS, Griffin, GA 30223. Appropriate recognition should be given when these genetic stocks are used.

T. A. COFFELT* (5)

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REGISTRATION OF PARENTAL LINES

Registration of B99 and B100 Inbred Lines of Maize

Inbreds B99 (Reg. no. PL-174, PI 584528) and B100 (Reg. no. PL-175, PI 584529) are yellow dent maize (*Zea mays* L.) lines developed cooperatively by the Iowa Agriculture and Home Economics Experiment Station and the USDA-ARS. The lines were released 12 May 1993 for their potential value in the production of hybrid seed and as sources of germplasm in pedigree-selection breeding programs.

B99 was developed from a population of 'Iowa Corn Borer Synthetic No. 1' (BSCB1) after 10 cycles of reciprocal recurrent selection (1). The other population in the reciprocal recurrent selection was 'Iowa Stiff Stalk Synthetic' [BSSS(R)Cn]. The line was a selection from the reciprocal recurrent selection program [BSCB1(R)C10-7233] and was one of 20 lines intermated to form BSCB1(R)C11. BSCB1(R)C10-7233 was included in the breeding and topcross nurseries at the S_1 generation ($F = 0.500$). On the basis of testcross performance, the line was advanced ear-to-row by six generations of self-pollination in the breeding nursery and included in the crossing nursery to produce single-cross seed with B73 and B89. In single-cross trials conducted at 9 (1990) and 10 (1991 and 1992) locations, its best performance was in crosses with B73. Single-cross B73 × B99 yielded 5.9% and 19.1% more than B73 × Mo17 in 1990 and 1991, respectively. B73 × B99 (10.65 t ha^{-1}) yielded similarly to B73 × Mo17 (11.08 t ha^{-1}) in 1992 [LSD (0.05) = 0.88 t ha^{-1}]. Grain moisture at harvest and root and stalk strength of B73 × B99 were similar to those of B73 × Mo17, but B99 crosses tended to have more root lodging than the commercial check hybrids. B99 flowers 2 d earlier than B73, and has similar plant and ear heights. Leaf midribs develop a reddish color after pollination. Pollen production is good, and silk emergence is coincident with pollen shed. Ears have 12 to 14 rows of yellow dent kernels on red cobs, and grain yield is similar to Mo17. B99 has good plant health, with average root and stalk strength and average resistance to first-generation European corn borer (*Ostrinia nubilalis* Hübner). B99 has greater potential as a male than as a female in the production of single-cross seed. Maturity classification is AES800.

B100 was developed from the cross of B85 (2) and H99. H99 was developed from Illinois Syn. 60C. The cross was backcrossed to H99, and pedigree selection within the backcross generation was used to develop B100 [(B85 × H99)H99-361]. Selections were entered in testcross evaluation, with A632 as tester at the S_3 generation ($F = 0.875$). Based on testcross performance, the line was advanced ear-to-row by four generations of self-pollination in the breeding nursery and included in the crossing nursery to produce single-cross seed with A632, A681, B87, and SD40. In single-cross trials conducted in 1990 (four locations), 1991 (two

locations), and 1992 (four locations), B100's best performance was in crosses with A632, A681, and SD40. Single-cross A632 × B100 yielded 15% more than did A619 × A632 in 1992 and 12.6% more than the average of all single crosses included in the trials conducted for 3 yr. Grain moisture level and root and stalk strength of A632 × B100 were similar to those of A619 × A632 in 1990 and 1991, but less than those of A619 × A632 in 1992. The average yield of B100 in crosses with A632, A681, and SD40 was 9.75 t ha^{-1}, compared with the average yield of 9.51 t ha^{-1} for four commercial checks in 1992, but grain moisture level of B100 in crosses averaged 30 g kg^{-1} higher than grain moisture level in checks. Inbred B100 is highly resistant to first-generation European corn borer.

Flowering time for B100 is similar to A632 and 4 d later than A681. Pollen production is excellent, and seed yields of B100 are similar to A681. Plant and ear heights of B100 are 20 to 30 cm less than A632 and A681. Ears have 14 rows of yellow, semiflint kernels on white cobs. B100 has good plant health, clean appearance, and is easy to maintain. B100 has potential as either a male or as a female in the production of hybrid seed. Maturity classification is AES600.

Breeder seed of B99 and B100 is maintained by the Iowa Agriculture and Home Economics Experiment Station and is distributed (100 seeds per request) by the Committee for Agricultural Development, 23 Curtiss Hall, Iowa State University, Ames, IA 50011.

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Registration of ICPM 93006, ICPM 93007, and ICPM 93008, Three Short-Duration Genetic Male-Sterile Parental Lines of Pigeonpea

Three short-duration genetic male-sterile parental lines of pigeonpea [*Cajanus cajan* (L.) Millsp.] designated as ICPM 93006 (Reg. no. PL-1, PI 586684), ICPM 93007 (Reg. no. PL-2, PI 586685), and ICPM 93008 (Reg. no. PL-3, PI 586686) were developed at the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) located at Patancheru, India. These genetic male-sterile lines were released by the ICRISAT Plant Materials Identification Committee (PMIC) in 1994. The basis for their release was the stable nature of their male-sterility, extensive usage in development of hybrids, and their use in the population improvement programs at ICRISAT Asia Center (IAC) and the Indian national programs. The world's first pigeonpea hybrid, ICPH 8, was developed by using ICPM 93006 as the female parent and the second hybrid, IPH 732, was developed by using ICPM 93008 as the female parent at IAC. Several other pigeonpea hybrids involving ICPM 93006, ICPM 93007, and ICPM 93008 are in multilocation trials. These male-sterile parental lines were developed by transferring a recessive male-sterile gene ms_1 from a medium-duration indeterminate pigeonpea male-sterile stock (MS 3A) through backcrossing. ICPM 93006 [= *ms* 'Prabhat' (DT)] and ICPM 93007 [= *ms* Prabhat (NDT)] were developed by backcrossing MS 3A to a short-duration determinate cultivar Prabhat as the recipient parent. Heterozygous (*MS ms*) segregants in the F_2 generation were backcrossed to Prabhat to produce BC_1F_1. From the BC_1F_2 population, determinate and indeterminate male-sterile (*ms ms*) plants were selected for further backcrossing to Prabhat. After five backcrosses, determinate (ICPM 93006) and indeterminate (ICPM 93007) male-sterile lines were developed and further maintained by sibbing. Using a similar procedure, ICPM 93008 (= *ms* T 21), with indeterminate growth habit, was developed by backcrossing MS 3A to an indeterminate short-duration cultivar, T 21, as the recurrent parent.

ICPM 93006 has a determinate plant habit, is 114 cm tall, and matures in about 110 d at IAC. ICPM 93007 is indeterminate, 138 cm tall, and matures in about 124 d at IAC. ICPM 93008 is indeterminate, 218 cm tall, and matures in about 125 d at IAC. All the three male-sterile lines have green stems, medium-sized leaves, yellow flowers with medium to dense red streaks, green pods with dark brown streaks, and dark brown oval seeds. The 100-seed weight is 7.5 g for ICPM 93006, 6.9 g for ICPM 93007, and 8.9 g for ICPM 93008. All three male-sterile lines produce numerous pods under open pollination.

The Genetic Resources Division of ICRISAT (Patancheru, AP, India) maintains and supplies breeder seed of these lines upon request.

L. J. REDDY, K. B. SAXENA, D. SHARMA, J. M. GREEN, A. N. RAO, AND R. V. KUMAR* (1)

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