

# REGISTRATION OF GERMPLASMS

## REGISTRATION OF MISCOT 7813 AND MISCOT 7841 GERMPLASM LINES OF COTTON

Two germplasm lines of cotton (*Gossypium hirsutum* L.), Miscot 7813 (Reg. no. GP-303) and Miscot 7841 (Reg. no. GP-304), were developed by the Dep. of Agronomy, Mississippi Agricultural and Forestry Experiment Station and released in May 1986. Miscot 7813, tested as 7813-52-1, was developed from a cross of two advanced strains, (GN-6-76 × MAR-22-74), from the Texas A&M Multi-Adversity Resistance program. Miscot 7841, tested as 7841-3-5, was developed from a cross between MAR-22-74 and 'Rex 713'.

Seed from individual F<sub>2</sub> plant selections of both crosses were reselected using modified MAR procedures (1) and F<sub>3</sub> plants were grown in a greenhouse. The major modification of the MAR procedures was direct selection for improved lateral root systems by planting seed with micropylar ends pointed toward the edge of cups. Subsequently, individual plants in advanced generations were reselected using the MAR procedures and evaluated for agronomic properties and insect resistance in field tests.

These lines displayed resistance to the tobacco budworm, *Heliothis virescens* F., in tests at the USDA-ARS Crop Science Research Laboratory, Mississippi State, MS. In these tests, lines were evaluated without tobacco budworm (control by insecticide) and with tobacco budworm (artificially infested with larvae). Average yields of the two resistant lines were 8.5% lower than 'Stoneville 213' in non-infested plots and 49.4% higher in infested plots.

In other field tests at Mississippi State and the Delta Branch Experiment Station, Stoneville, MS, yields of Miscot 7813 and Miscot 7841 were comparable with that of Stoneville 213 and earliness was comparable with that of 'DES 56'. Both lines are resistant to bacterial blight, [*Xanthomonas campestris* pv *malvacearum* (Smith) Dye]. Lint fraction and micronaire of each line are about 2 and 0.5 units, respectively, less than Stoneville 213. Fiber length (2.5% SL) of Miscot 7841 is equivalent to that of Stoneville 213 and approximately 10% greater than that of Miscot 7813. Mean fiber length (50% SL), strength (T<sub>1</sub>), and elongation (E<sub>1</sub>) of the lines are equivalent to those of Stoneville 213. The relatively high resistance to tobacco budworm and bacterial blight of these two lines indicates that they may be valuable in the development of improved cotton cultivars.

Seed (25 g) of these breeding lines may be obtained from the Dep. of Agronomy, P.O. Box 5248, Mississippi State, MS 39762.

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### References and Notes

1. Bird, L.S. 1982. The MAR (multi-adversity resistance) system for genetic improvement of cotton. *Plant Dis.* 66:172-176.
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## REGISTRATION OF ICML 11 RUST-RESISTANT PEARL MILLET GERMPLASM

AN S<sub>3</sub> progeny of pearl millet [*Pennisetum americanum* (L.) Leeke] (Reg. no. GP-51) has been named and released in 1984 as ICML 11 by ICRISAT. The germplasm line was derived through five generations of selfing and ear-to-row selection from accession IP 2696 which originated from the Republic of Chad. ICML 11 was made available in 1984 as a source of resistance to pearl millet rust caused by *Puccinia penniseti* Zimm. [= *P. substriata* Ell. and Barth. var. *indica* Ramachar and Cumm.]. ICML 11 also showed resistance to downy mildew caused by *Sclerospora graminicola* (Sacc.) Schroet. in India with about 10% infection compared with >80% in the susceptible check (F<sub>1</sub> hybrid, NHB 3). ICML 11 is an early-maturing line (65-70 days from planting to harvest), has rapid early leaf development, tillers profusely

(6-7 head bearing tillers/plant), produces short (7-10 cm), compact, cylindrical heads and bears medium-sized (8 g/1000) grey brown, obovate seed. Its resistance to rust is based on hypersensitivity, with slight necrotic flecking, and a complete absence of pustule development. Experiments conducted at three locations in India in 1983 on parents and progenies of crosses between ICML 11 and several susceptible lines, showed that resistance was due to a single dominant gene, named Rpp1(1).

The stability of rust resistance of ICML 11 was evaluated using Cobb's modified scale (2) at soft dough stage under natural rust pressure in tests grown at five locations in India in 1984. ICML 11 remained rust free at all five locations (Table 1). In contrast, the rust severity in 700481-21-8, a rust-resistant check, varied from 1% at Ludhiana to a maximum of 10% at Bhavanisagar. In the rust-susceptible check, hybrid NHB 3, all plants evaluated developed rust with se-

Table 1. Mean rust severity of three pearl millet lines grown at five locations in India during the 1984 rainy season.

Entry	Mean rust† severity at				
	Kovilpatti (9N, 78 E)	Bhavanisagar (11N 77 E)	ICRISAT Center (17N, 78 E)	Pune (18N, 74 E)	Ludhiana (31N 76 E)
	%				
ICML 11	0 (0/40)‡	0 (0/40)	0 (0/40)	0 (0/40)	0 (0/40)
700481-21-8§	4 (20/40)	10 (33/40)	5 (28/40)	6 (13/40)	1 (9/26)
NHB 3¶	28 (200/200)	72 (200/200)	55 (200/200)	58 (200/200)	25 (200/200)

† Mean of two plots for ICML 11 and 700481-21-8, and 10 plots for NHB-3.

‡ Figures in parentheses are number of rusted plants/total plants assessed.

§ Rust-resistant check.

¶ Rust-susceptible check.

verity ranging from 25% at Ludhiana to 72% at Bhavanisagar. Rust resistance from ICML 11 is currently being transferred into male-sterile lines.

Seed stocks of ICML 11 will be maintained and distributed by the International Crops Research Institute for the Semi-Arid Tropics, Patancheru, P.O. A.P. 502 324, India.

S. D. SINGH, D. J. ANDREWS, AND K. N. RAI (3)

#### References and Notes

1. Andrews, D.J., K.N. Rai, and S.D. Singh. 1985. A single dominant gene for rust resistance in pearl millet. *Crop. Sci.* 25:565-566.
2. Melchers, L.E., and J.H. Parker. 1922. Rust resistance in winter wheat varieties. *USDA Bull.* 1046.
3. Millet pathologist, ICRISAT, Patancheru, P.O. 502324, A.P. India; professor, Dep. of Agronomy, Univ. of Nebraska, Lincoln, USA; and millet breeder, ICRISAT, Patancheru, respectively. Submitted as J.A. no. 559 by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). Registration by the Crop Sci. Soc. of Am. Accepted 30 Sept. 1986.

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### REGISTRATION OF FOUR GERMPLASM LINES OF CICER MILKVETCH

FOUR germplasm lines of cicer milkvetch (*Astragalus cicer* L.) (Reg. no. GP-66 to GP-69) were developed by the ARS-USDA and the Colorado Agric. Exp. Stn. and released in 1986. They were selected for improved seedling emergence, high seed weight, and improved forage yield.

C-10 (GP-66) and C-11 (GP-67) germplasms were developed by recurrent selection in progenies resulting from a diallel cross (1). Six plants with excellent mature plant vigor and high seed weight were crossed in a diallel. Seed weight of the six clones was one or more standard deviations above the mean of a population composed of plant introductions including PI's 66515, 133142, 206405, 246727, 263225, and 297335. Seed weight for individual plants of the diallel progenies ranged from 3.20 to 5.00 mg with a mean of 3.99 mg. Two subpopulations, C-10 and C-11, were developed in the second cycle of recurrent selection (2). For C-10, a 20-clone synthetic, selection pressure was high for mature plant vigor, but was relaxed somewhat for seed weight. For C-11, an 18-clone synthetic, the situation was reversed in that selection pressure was high for seed weight, but was relaxed somewhat for vigor. However, vigor of all parental clones was good. Seed weight of the parental clones of C-10 ranged from 3.71 to 4.53 mg with a mean of 4.10 mg. Seed weight of the parental clones of C-11 ranged from 4.20 to 4.85 mg with a mean of 4.43 mg. In comparison, seed weight of the cv. Monarch, Lutana, and Oxley is 4.14, 3.64, and 3.52 mg, respectively. Seedling emergence for the 38 polycross progenies of C-10 and C-11 ranged from 91 to 125% of that of a large-seeded reference lot (30 seedlings/m of row) with a mean of 108%. In general, mature plant vigor of C-10 and C-11 germplasms is greater than that of C-12 and C-13 germplasms. Six clones from the two germplasms were selected for inclusion as parents of Monarch because their polycross progenies had superior seedling emergence and forage yield (3).

C-12 (GP-68) and C-13 (GP-69) germplasms were developed by recurrent selection from the same source nursery as C-10 and C-11 germplasms. Initially, 19 plants were selected with average or above vigor and a seed weight that was also one or more standard deviations above the mean. The six

parents used in the diallel were included. In the first cycle of selection, seed weight of individual plants of the 19 polycross progenies ranged from 2.97 to 5.40 mg with a mean of 3.97 mg (2). Two subpopulations, C-12 and C-13, were developed in the second cycle of recurrent selection. The selection pressures for seed weight and plant vigor that were used to develop C-12, a 17-clone synthetic, and C-13, a 25-clone synthetic, were identical to those used to develop C-10 and C-11, respectively. Seed weight of the parental clones of C-12 ranged from 4.02 to 4.80 mg with a mean of 4.40 mg. Seed weight of the parental clones of C-13 ranged from 4.51 to 5.40 mg with a mean of 4.73 mg. Seedling emergence of the 42 polycross progenies of C-12 and C-13 ranged from 80 to 133% of that of the large-seeded reference lot with a mean of 114%. Eleven clones from C-12 and C-13 were selected for inclusion as parents of Monarch because their polycross progenies had excellent seedling emergence in diverse environments and generally yielded more forage than that of the cultivar Lutana (3).

An equal amount of polycross seed (by weight) from each parental clone within a germplasm was composited. Small quantities of seed (up to 25 g) will be provided to each forage crop researcher upon written request. It is asked that appropriate recognition of its source be made a matter of open record when these germplasms contribute to the development of an improved cultivar of cicer milkvetch. Requests should be sent to the Crops Research Laboratory-USDA-ARS, Colorado State University, Fort Collins, CO 80523.

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#### References and Notes

1. Townsend, C.E. 1975. General and specific combining ability for several agronomic traits in diallel cross progenies of cicer milkvetch. *Crop Sci.* 15:341-343.
2. ———. 1977. Recurrent selection for high seed weight in cicer milkvetch. *Crop Sci.* 17:473-476.
3. ———. 1980. Registration of Monarch cicer milkvetch (Reg. no. 20). *Crop Sci.* 20:670-671.
4. Research geneticist, USDA-ARS, Crops Res. Lab., Colorado State Univ., Fort Collins, CO 80523. Registration by the Crop Sci. Soc. of Am. Accepted 30 Oct. 1986.

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### REGISTRATION OF NDSBF MAIZE GERMPLASM

THE NDSBF (Reg. no. GP-151) is a yellow-dent endosperm maize (*Zea mays* L.) synthetic released in 1986. It was developed by one cycle of full-sib family selection among 78 full-sib families between NDSB(FS)<sub>C<sub>1</sub></sub> and NDSF(FS)<sub>C<sub>1</sub></sub>. NDSB(FS)<sub>C<sub>1</sub></sub> and NDSF(FS)<sub>C<sub>1</sub></sub> were produced by one cycle of reciprocal full-sib selection from NDSB (1) and NDSF (2). The 78 full-sib families were evaluated in three environments, and 20 superior families were identified with a rank-summation index which was computed by summing the ranks of each of four traits. This index weighted yield 40 and 20% each for low grain moisture, stalk lodging, and root lodging percentages. These 20 families were intercrossed by sib-matings and bulking seed. An additional generation was random mated, and seed was bulked to produce NDSBF.

NDSBF plants are slightly taller than NDSB plants, but are similar in plant and ear height to NDSF plants. When averaged over nine North Dakota environments (1984 and 1985), NDSBF had improved grain yield, test weight, ear moisture, and root lodging resistance compared with NDSB. NDSBF's yield was not significantly different from NDSAB,