tapine 41 when evaluated 60 d after planting in a RN-infested field at Baton Rouge in 1986. Three of the lines (La. RN 909, La. RN 910, La. RN 1032) were compared with Deltapine 41 for degree of root galling after growing in heavily infested RKN soil in the greenhouse. Their average root-knot scores were 2.6, 2.8, and 2.6, respectively, compared with 5.0 for Deltapine 41.

These germplasm lines, except La. RN 4-4, were compared with Deltapine 41 and Stoneville 825 cultivars for agronomic performance at multiple year-location environments (eight tests) in Louisiana on soils relatively free from the nematode-wilt disease complex. All germplasm lines produced mean lint yields equal to or greater than the check cultivars and with fiber superior to Deltapine 41 in strength and fineness and equal or superior to this check in length. Lint percentages of the three germplasm lines were similar to Stoneville 825; boll size of all RN germplasm lines were significantly larger than either check cultivar. The RN lines are full-season cotton germplasms that are similar to their Deltapine 16 parent in crop maturity and plant size. La. RN 4-4 is expected to perform similarly to La. RN 909 and La. RN 910 since all are sister lines.

These agronomically enhanced breeding lines represent the first germplasm releases of cotton with known resistance to the reniform nematode. They could be of value in improving the level of pest resistance in cotton cultivars. Seed (25 g) of these lines are available for distribution to cotton breeders and other scientists upon written request to Jack E. Jones, Department of Agronomy, Louisiana Agricultural Experiment Station, M. B. Sturgis Hall, Baton Rouge, LA 70803.

J. E. Jones,* J. P. Beasley, J. I. Dickson, and W. D. Caldwell (7)

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REGISTRATION OF THREE INSECT RESISTANT COTTON GERMPLASM LINES

Three cotton (*Gossypium hirsutum* L.) germplasm lines [La. HG-063 (Reg. no. GP-313) (PI 511345), La. HG-065 (Reg. no. GP-314) (PI 511346), and La. HG-660 (Reg. no. GP-315) (PI 511347)] were released by the Louisiana Agricultural Experiment Station in 1987. These lines combine resistance to the cotton bollworm-tobacco budworm pest complex, *Heliothis zea* (Boddie) and *H. virescens* (F.), with early crop maturity, good yielding ability, acceptable fiber quality, small bracts, and reduced plant pubescence. Resistance to *Heliothis* spp. is attributed to gossypol-like compounds (HG) found in a high frequency of normal-size glands located over the calyx (including lobes), ovary wall, and other plant parts (1, 2).

The La. HG-063, La. HG-065, and La. HG-660 germplasm lines were developed from a cross between two HG strains, La. HG 83-1-1546 × La. HG 1838-1497. The two parent strains were selected from an intercrossed population involving Louisiana advanced breeding strains, 'Stoneville 213', and GT5A-10-15-2XG15. The strain GT5A-10-15-2XG15, obtained from M.J. Lukefahr, was the original source of the HG trait. Primary selection for resistance was based on frequency of glands on the clayx lobes (3) and plant reaction to natural *Heliothis* spp. infestations.

The three La. HG germplasm lines averaged 56 to 65% of the worm-damaged fruit and 51 to 71% of larvae in fruit that were observed on Stoneville 213. The La. HG lines had three-test yield averages that exceeded Stoneville 213 by 16 to 31% when *Heliothis* spp. were above the economic threshold level (5% damaged squares). Five-test mean lint yields of these germplasm lines ranged from 98 to 110% of Stoneville 213 when damage levels from *Heliothis* spp. were below economic threshold levels. The HG germplasm lines were similar to Stoneville 213 in lint percentage, fiber length, and fiber fineness. They were earlier in crop maturity and had higher fiber tensile strength than this check. These germplasm lines have reduced plant pubescence and smaller bracts and bolls than Stoneville 213. They are susceptible to fusarium wilt [*Fusarium oxysporum* Schlect. *f.* sp. *vasinfectum* (Atk.) Snyd. and Hans.].

Seed (25 g) of these lines are available for distribution to scientists upon written request to: Jack E. Jones, Department of Agronomy, Louisiana Agricultural Experiment Station, M. B. Sturgis Hall, Baton Rouge, Louisiana, 70803.

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REGISTRATION OF MISCOT 7913-51, MISCOT 7913-83, AND MISCOT 7913-84 GERMPLASM LINES OF COTTON

Three germplasm lines of cotton (*Gossypium hirsutum* L.), Miscot 7913-51 (GP-316) (PI 511348), Miscot 7913-83 (GP-317) (PI 511349), and Miscot 7913-84 (GP-318) (PI 511350),

developed by the Department of Agronomy, Mississippi Agricultural and Forestry Experiment Station were released in May 1987. The three lines were derived from a cross between 'McNair 235' and CAMD-21S-78 [a glabrous advanced line from the Texas A&M University Multi-Adversity Resistance (MAR) Program].

Seed from individual F_2 plants were screened in the greenhouse using the MAR procedure (1) modified to permit direct selection for high number of lateral roots on 3-wk-old seedlings. Subsquently, individual plants in advanced generations were reselected using the MAR procedure and evaluated for agronomic and host plant resistance properties. The lines designated as 7913-83 and 7913-84 were the superior glabrous genotypes, whereas 7913-51 was the superior genotype with normal pubescence.

All three lines are resistant to bacterial blight [caused by *Xanthomonas campestris* pv *malvacearum* (Smith) Dye] and equal to McNair 235 for resistance to Fusarium wilt [caused by *Fusarium oxysporum* f. sp. *vasinfectum* (Atk.) Snyd. and Hans.]. In laboratory tests, Miscot 7913-51 had significantly less seedling disease (incited by *Pythium* spp.) symptoms than 'Stoneville 213'. Average yield of Miscot 7913-51 in 1985 and 1986 tests by the USDA-ARS Crop Science Research Laboratory, Mississippi State, MS, was 67% higher than Stoneville 213 when artificially infested with *Heliothis virescens* F. larval and 36% higher when tobacco budworms were controlled with insecticides. Due to their glabrous characteristic, Miscot 7913-83 and Miscot 7913-84 should also show some resistance to *Heliothis* spp.

Average lint yields of Miscot 7913-51, Miscot 7913-83, and Miscot 7913-84 were equal to, 6% less, and 9% less than 'DES 422', respectively, in tests conducted from 1984 through 1986 at Mississippi State, MS, and the Delta Branch Experiment Station, Stoneville, MS. Each line matured slightly earlier than DES 422. Plant heights of Miscot 7913-51, Miscot 7913-83, and Miscot 7913-84 were 5, 12, and 20% taller than DES 422, respectively. Lint percentages of Miscot 7913-51 and Miscot 7913-83 were equal to DES 422, and Miscot 7913-84 was 2.5 units higher. Compared with DES 422, fiber of the two glabrous lines was 5% shorter in length and 10% weaker in strength. Fiber of Miscot 7913-51 was slightly longer than the glabrous lines and was 6% higher in strength than DES 422. Fiber micronaire of the three lines were equal to DES 422.

Lint yields of a composite (7913S) of Miscot 7913-83 and Miscot 7913-84 with glabrous sister lines and a composite (7913H) of Miscot 7913-51 with pubsescent sister lines were 10 and 13% higher than Stoneville 213, respectfully, in the 1985 and 1986 Regional *Heliothis* tests conducted at locations from North Carolina to Texas.

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

F. M. Bourland (2)

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REGISTRATION OF NDSCD, NDSK(FS)C1, AND NDSL(FS)C1 MAIZE GERMPLASMS

Three maize (*Zea mays* L.) [Reg. no. GP-161 (PI 510671), GP-162 (PI 510672), and GP-163 (PI 510673)] breeding populations developed at the Agricultural Experiment Station, North Dakota State University, Fargo, were released in March 1987 for breeding programs in short-growing season areas. Breeder seedstocks are maintained by the North Dakota Agricultural Experiment Station and can be obtained in germplasm quantities (200 kernels) from H.Z. Cross, Agronomy Department, North Dakota State University, Fargo, ND 58105.

NDSCD (Reg. no. GP-161) is a yellow-endosperm, dent synthetic developed by one cycle of full-sib family selection among 78 full-sib families between NDSC(FS)C1 and NDSD(FS)C1 (1). NDSC(FS)C1 and NDSD(FS)C1 were produced by one cycle of reciprocal full-sib selection from NDSC and NDSD (2). The 78 full-sib families were evaluated in three environments, and 20 superior families were identified based on a rank-summation index that weighted yield 40 and 20% each for low grain moisture, stalk lodging, and root lodging percentages. These 20 families were intercrossed by making sib matings and bulking seed. An additional generation of random mating was practiced and seed was bulked to produce NDSCD. NDSCD in tests at four locations in 1986 averaged almost 24% higher grain yield and had stalk lodging, and root lodging percentages equal to or better than the best parental synthetic. When compared to NDSAB, the highest yielding synthetic in previous tests (3, 4, 5), NDSCD over 3 yr (13 environments) had improved test weight and was not significantly different from NDSAB for yield, and stalk and root lodging. Because NDSCD had higher ear moisture at harvest than did NDSAB, which is AES200 maturity, NDSCD should be AES300 maturity.

NDSK(FS)C1 (Reg. no. GP-162) and NDSL(FS)C1 (Reg. no. GP-163) were developed after one cycle of reciprocal full-sib selection among full-sib families between NDSA and NDSB, synthetics released earlier (6). Among approximately 400 sets of attempted crosses, 41 successful full-sib families with corresponding selfed ears were obtained and tested at three locations. Fifteen superior families were identified based on the same rank-summation index listed above. Remnant seed of selfed ears from plants that produced the superior full-sib families were planted and intercrossed within both NDSA and NDSB by making full-sib matings and compositing seed within each for the improved synthetics NDSK(FS)C1 and NDSL(FS)C1, respectively. NDSK(FS)C1 has similar yield and stalk lodging as its parent, NDSA, but it is significantly earlier as indicated by lower ear moisture at harvest, and tends to have better root lodging resistance and higher test weight than NDSA. NDSL(FS)C1 is significantly higher yielding and has significantly higher test weight and lower root and stalk lodging percentages than its parent, NDSB. NDSK(FS)C1 and NDSL(FS)C1 are AES200 maturity.

NDSCD appears to be a promising source population for developing early inbreds because both NDSC and NDSD have proved to be productive source populations (ND257 and ND261 were selected from NDSC and NDSD, respectively), and NDSCD is equal to or better than NDSC or NDSD for yield, ear moisture content, root and stalk lodging resistance, and test weight. NDSB also is a proven source population (ND260 was developed from NDSB). Since NDSK(FS)C1 and NDSL(FS)C1 were developed by interpopulation improvement designed to increase both specific