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REGISTRATION OF FOUR DOUBLED HAPLOID COTTON GERMPLASMS

M-DH-118 (Reg. no. GP242), M-DH-121 (Reg. no. GP243), M-DH-126 (Reg. no. GP244), and M-DH-128 (Reg. no. GP245) were released as germplasm lines resistant to tobacco budworm, *Heliothis virescens* (F.), by the USDA-ARS and the Mississippi Agricultural and Forestry Experiment Station in 1983. They were produced as *Gossypium hirsutum* L. paternal haploids via semigamy in *G. barbadense* cytoplasm. Haploids were doubled with colchicine. The paternal parent was a heterozygous line MOHG obtained from W.P. Sappenfield (2) which has resistance to the tobacco budworm.

Lint yield of each of the four doubled haploids is 30 to 36% less than 'Stoneville 213' (ST 213) when protected from insects with insecticides. Resistance is measured as the ability to yield when artificially infested with 12 first instar tobacco budworm larvae per plant, on a weekly basis, for 6 weeks. Under these infestations, M-DH-118, M-DH-121, M-DH-126, and M-DH-128 yielded 57, 60, 66, and 39% of their respective yield when under insecticidal protection from insects. The MOHG parent yielded 43% and the two checks, ST 213 and ST 7A glandless, yielded 28 and 18% of their respective protected yield.

Each line lodges excessively as does MOHG. When compared with MOHG, the M-DH-118 has higher lint percent, greater fiber elongation, larger bolls, and stronger fiber; M-DH-121 has higher lint percent, larger bolls, and greater fiber elongation; M-DH-126 has smaller bolls with a shorter, coarser, stronger fiber; M-DH-128 has larger bolls with higher lint percent, stronger fiber with greater elongation. Each line is slightly earlier than MOHG, Mahill (1).

These doubled haploid lines, compared with MOHG, have equal or greater resistance to tobacco budworm, and generally have improved yield components and fiber properties. They are also genetically stable, true breeding sources of resistance to tobacco budworm.

Terminal leaf gossypol in each line is equivalent to MOHG and ST 213. Square gossypol of all lines except M-DH-126 is equivalent to ST 213 but lower than MOHG. Gossypol in blooms is higher in each than in ST 213 and equal to MOHG. Seed gossypol in each line, except M-DH-118, is lower than in ST 213 or MOHG. Thus, the resistance to the tobacco budworm in these lines may be due in part to increased gossypol levels from the MOHG parent.

Small amounts of seed of these lines are available for distribution to cotton breeders and other research workers until present supply is exhausted. Written requests should be addressed to J.N. Jenkins, Crop Science Res. Lab., P.O. Box 5367, Mississippi State, MS 39762.

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REGISTRATION OF MHR-1, TOBACCO BUDWORM RESISTANT COTTON GERMPLASM

MHR-1 IS A germplasm line of cotton, *Gossypium hirsutum* L. (Reg. no. GP246), which has resistance to the tobacco budworm, *Heliothis virescens* (F.). It was released by USDA-ARS and the Mississippi Agricultural and Forestry Experiment Station in 1983. MHR-1 as released is a composite of nine lines in the F_7 from (DES-24 × MOHG) × MOHG. 'DES-24' was developed as a high yielding early strain by R.R. Bridge (1) and the MOHG strain was obtained as a *Heliothis* spp. resistant composite from W.P. Sappenfield (2) in 1976.

In 1982, MHR-1 was tested as a F_4 composite at nine locations in seven states. At three locations MHR-1 and 'Stoneville 213' (ST 213) were grown under *Heliothis* spp. infestation with average yields of 950 and 824 kg lint/ha for MHR-1 and ST 213, respectively. When *Heliothis* spp. were controlled, lint yields averaged over locations were 1275 and 1513 kg/ha for MHR-1 and ST 213, respectively. Thus MHR-1 yielded 15% more than ST 213 when *Heliothis* spp. were not controlled and 16% less than ST 213 when they were controlled. Lint percent of MHR-1 is 1.2% less than that of ST 213.

Resistance in MHR-1 was measured as the ability to yield when artificially infested with 12 first instar tobacco budworm larvae per plant for each of 6 weeks. MHR-1 and ST 213 were compared in 1982 at Mississippi State, Miss., when artificially inoculated for 6 weeks with tobacco budworm larvae and when protected with insecticides. MHR-1 under infestation attained 62% of its protected yield; whereas, ST 213 attained only 48% of its protected yield. Although significant yield losses occurred with both cottons the yield loss averaged 630 kg/ha with MHR-1 and 1107 with ST 213. The F_3 generation of the nine lines which became MHR-1 plus the parents and two checks were grown with an artificial infestation of tobacco budworm larvae and under protection with insecticides in 1980 at Mississippi State. In 1981 and 1982 the test was repeated except the F_4 and F_5 generations, respectively, were grown instead of the F_3. The nine lines averaged 23% yield loss; whereas, the parents DES-24 and MOHG averaged 47 and 17% yield loss, respectively. The two checks, ST 213 and Stoneville 7A glandless, averaged 46 and 51% yield loss, respectively. When protected from tobacco budworm the nine lines av-

eraged 3027 kg seed cotton/ha; whereas, MOHG averaged 2591. The composite, MHR-1, thus has higher yield than MOHG and has retained much of the resistance of MOHG to tobacco budworm. We do not know the mechanism of resistance.

Seed released as MHR-1 is a composite of equal amounts of seed from the above nine lines in the F_7 generation. Small amounts of seed are available for distribution to cotton geneticists and other research workers. Written requests should be addressed to J.N. Jenkins, Crop Science Res. Lab., P.O. Box 5367, Mississippi State, MS 39762.

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REGISTRATION OF GT-RI4 MAIZE GERMPLASM

THE FLINT AND DENT MAIZE (*Zea mays* L.) synthetic GT-RI4 (Reg. no. GP128) was developed by index selection, within the base population RFC, specifically for its resistance to ear feeding by the corn earworm, *Heliothis zea* (Boddie). RFC was derived from crosses of (B10 × B14), Manfredi (Argentina), and CBC (Corn Belt Composite) with more than 30 Latin American selections ranging in latitude of adaptation from Panama to Cuba. GT-RI4 is the result of four cycles of recurrent selection using a selection index involving corn earworm damage, husk extension and tightness, and plant maturity, with the least emphasis on husk extension and plant maturity (1). At least 250 S_1 progenies were evaluated during each selection cycle, and 10% of the best performing S_1's were recombined from remnant seed to form the successive cycle's population. Compared with GT-CEW-RS8, a mid-season dent synthetic population previously released as a source of resistance to damage by the corn earworm, GT-RI4 averaged 1.7 cm less ear penetration, 2 days earlier maturity, 1.8 cm shorter husk extension, 8% tighter husks, 15 cm shorter plant height, 4 cm lower ear placement, 4% more lodging, 0.14 more ears/plant, and was equal in grain quality. Greater prolificacy may have contributed to the 0.5 to 1.5 Mg ha^{-1} increased grain yields of GT-RI4 over that obtained from GT-CEW-RS8. The comparisons were made over a wide range of environmental conditions, both as populations and in hybrid combinations. Breeder seed will be maintained by Southern Grain Insects Res. Lab., P.O. Box 748, Tifton, GA 31793-0748 and can be obtained in limited quantities from the authors.

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REGISTRATION OF AU 1 *PHALARIS* GERMPLASM

AU 1 *Phalaris* (Reg. no. GP26) is an open-pollinated population of *Phalaris aquatica* L. that was assembled from 36 clones which were selected for persistence, vigor, and adaptation to the conditions common to the Southeastern United States. It was released in August 1983 by the Alabama Agricultural Experiment Station, Auburn University.

The 36 clones were selected from 3630 spaced plants (30 plants each of 121 PI accessions) that were established at the Auburn University Plant Breeding Unit, Tallassee, Ala. in the fall of 1969. One hundred forty-four individuals were selected for superior persistence, adaptation, and vigor in 1972. In the fall of 1973, these were divided into ramets and transplated in a replicated (4×) nursery at the above location. In 1980, these clones were reselected for the above characteristics and the 36 judged superior were placed in an isolation block with four replications and allowed to open pollinate. Except where noted, the 36 clones selected are single plant selections from the following PI accessions: PI 193056, PI 196338, PI 202394, PI 206710, PI 207961, PI 207963 (2 plants selected), PI 207964, PI 219636, PI 223182 (3 plants selected), PI 232088, PI 236542, PI 236543, PI 236545, PI 240227 (2 plants selected), PI 240229, PI 240233, PI 240272, PI 240276, PI 240278, PI 240283, PI 284202 (3 plants selected), PI 284203, PI 284205, PI 284218, PI 284243 (2 plants selected), PI 294263, PI 302437, PI 308605, and PS-68-271 (a bulk of an old Auburn University PI nursery).

Seed of each clone represented in the isolation block were harvested separately in the spring of 1982. Equal amounts of seed of each individual were composited and seeded in rows in isolation in the fall of 1982. These progenies were allowed to open pollinate, and seed were harvested in bulk in the spring of 1983.

This open pollinated population is the culmination of 14 years of work during which over 3000 *Phalaris* individuals were screened for general adaptation to Alabama. At this time, *Phalaris* breeding has been terminated at Auburn University. This germplasm was produced and released to preserve the progress made during that period and to make this improved material available to breeders with active programs involving this species. Limited amounts of AU 1 *Phalaris* seed may be obtained from Dr. J.F. Pedersen, Dep. of Agronomy and Soils, Auburn Univ., AL 36849.

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References and Notes

1. Assistant professor of agronomy; former assistant professor of agronomy (director of Sorghum Research, Cargill Inc., Plainview, Tex); former associate professor of agronomy (president, SunRise, Inc., Auburn, Ala.); and former professor of agronomy (professor, Agronomy Dep., Univ. of Georgia, Athens, Ga.). Registration by the Crop Sci. Soc. of Am. Contribution of Alabama Agric. Exp. Stn., Auburn Univ., AL 36849. Accepted 8 Dec. 1983.