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caryopses; awned, awnleted and hooded lemmas; white and blue aleurone; rough and smooth awns; black and white lemmas and paleas; winter, facultative and spring growth habit; and a wide range of maturity dates and spike densities. Seed is available in 1 to 2 kg lots from any of the authors. Composite Cross XXXIV seed may be planted in the fall or the spring, depending on local conditions. Possible uses of composite crosses have been reviewed (6, 9), and a suggested list of methods for using this cross will be sent to each person requesting seed.

As new sources of Al/acid soil tolerance become available, they will be crossed onto male sterile segregates from three of the six tolerant cultivars and increases from these will be incorporated into planting stocks for future seed increases and considered a part of CC XXXIV. Seed of the composite will be maintained jointly by the Arizona Agric. Exp. Stn. and the USDA.

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REGISTRATION OF C-20 ZIGZAG CLOVER GERMPLASM[1]

(Reg No. GP 28)

Noel Faust and Heinz Gasser[2]

C-20 zigzag clover (*Trifolium medium* L.) germplasm pool was developed by six cycles of recurrent selection on material originating from Canada, Yugoslavia, and the USSR. Fertility, as measured by the percentage of florets setting seed, was increased from 7 to 15%. C-20 is winterhardy and intermediate in maturity. By the 2nd year of growth average spread and height of spaced plants was 0.66 m^2 and 24 cm, respectively. Over 94% of the plants were semi-erect for growth habit. Average forage yield over 11 station-years was 4,781 kg/ha of dry matter. Protein and total digestible nutrients averaged 15 and 65%, respectively. C-20 flowers profusely and flower color ranges from pale to dark red. Cuttings from the 50 best ecotypes were used to establish a seed nursery of 400 plants. The bumble bee (*Bombus* spp.) was the principal pollinator. Plants with a seed yield of 9 g or greater were composited to form the pool. Seed is available in 20-g lots from the Station de Recherche Agricole, 3300, rue Sicotte, C.P. 480 St-Hyacinthe, Quebec J2S 7B8, Canada.

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[2]Research agronomist, Agric. Res. Stn., St-Hyacinthe, Quebec and Director, Res. Stns. Serv., Sainte-Foy, Quebec.

REGISTRATION OF DES-146-C COTTON GERMPLASM[1]

(Reg. No. GP 155)

Vesta G. Meyer[2]

DES-146-C is a cotton (*G. hirsutum* L.) germplasm line developed at the Delta Branch of the Mississippi Agric. and Forestry Exp. Stn.

DES-146-C possesses a strong fertility-restorer gene that may be useful for producing hybrid cotton based on the *G. harknessii* Brandegee cytoplasmic male sterility.

DES-146-C is derived from a cross in which the male parent was an F_1 hybrid between *G. hirsutum* 'M8' and *G. aridum* (Rose and Standley) Skovsted, and the female parent had *G. harknessii* cytoplasm and a complex pedigree that includes backcrosses to Upland cotton (*G. hirsutum*), interspersed with selfs and with test-crosses to male-sterile lines with *G. harknessii* cytoplasm. It was selected on the basis of its test-cross performance in restoring fertility with several male-sterile lines. In addition to the previously identified fertility-restorer factor from *G. harknessii*, DES-146-C possesses a second strong fertility-restorer gene which appears to be stable under environmental stress. Seed for the present release is from F_2 (1979) progeny rows from individual plants in 1978, row 146. In test-crosses grown in 1979, it produced ratios of 3 fertile: 1 male-sterile. The rows are segregating also for nectariless, glandless, occasional male-sterile plants, yellow petal from *G. harknessii*, and degrees of plant hairiness. Due to the present interest in producing hybrid cotton, this stock is being released with considerable genetic variability. Other plant and fiber characteristics of row 146 did not differ strikingly from those of Upland cultivars grown in the Mississippi Delta. For male-fertile plants, seed index ranged from 11.3 to 14.5 g, lint index from 4.5 to 8.5 g; lint % from 31.9 to 42.1; 2.5% span fiber length from 25.9 to 28.7 mm; 50% span fiber length from 10.6 to 12.7 mm; T_1 fiber strength from 180 to 210 m N/tex; E_1 elongation from 5.0 to 7.1%; and micronaire from 3.1 to 4.65 units.

Probably the simplest means for maintaining high levels of fertility restoration during further transfer of the new restorer to Upland cotton cultivars would be to use test crosses of the most fertile plants in each generation to cytoplasmic male sterile lines from that cultivar. This would minimize the chance of separating the two genes for fertility during the breeding process.

Limited quantities of seed will be available upon written request for breeding or other research purposes after December 1979 from Robert R. Bridge, Delta Branch Exp. Stn., Stoneville, MS 38776.

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[2]Geneticist, Delta Branch, Mississippi Agric. and Forestry Exp. Stn., Stoneville, MS 38776.

REGISTRATION OF THREE GERMPLASM LINES OF COTTON[1]

(Reg. No. GP 156 to GP 158)

R. R. Bridge[2]

THREE breeding lines of cotton (*Gossypium hirsutum* L.), DES 04-6 (GP 156), DES 04-11 (GP 157) and DES 04-606 (GP 158) with glyphosate tolerance were developed at the Delta Branch, Mississippi Agric. and Forestry Exp. Stn.

In 1975 a noncommercial stock designated as DES 21326-04 was released because of its potential value in cotton breeding programs emphasizing earliness. DES 21326-04 originated from a 1965 cross, PD62-164 × 'Stoneville 213', which was the same cross that produced DES 56 cotton (Reg. No. 70).[3] The F_2 population of this cross was intercrossed at random in 1966 and DES 21326-04 was from a single plant selection in the F_2 generation of the intercross population and subsequent reselection in the F_7 generation. DES 21326-04 pro-

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[2]Plant breeder, Delta Branch, Mississippi Agric. and Forestry Exp. Stn., Stoneville, MS 38776.

[3]Bridge, R. R., and J. F. Chism. 1978. Registration of DES 56 cotton (Reg. No. 70). Crop Sci. 18:524.