plenty evaluated in this area. It also may be of value as a bridge in further interspecific hybridization in the *Trifolium* genus.

Two generations of the hybrid will be provided to each plant breeder upon written request to the Department of Agronomy, University of Kentucky, Agricultural Science Center, Lexington, Kentucky 40506.


REGISTRATION OF SIXTEEN GERMPLASM LINES OF UPLAND COTTON

(Reg. No. GP 3 to GP 18)

Vesta G. Meyer

The stocks of Upland cotton (*Gossypium hirsutum* L.) given in Table 1 originated from a modified backcross program to develop breeding stocks with the Upland cotton genome in cytoplasmic genetic male sterility genes. The sterility was not expressed in the heterozygous backcross generations, and incidence of the recessive genes for sterility is expected to be low in these germplasm lines. DES-HAF 16 and 277 were produced from male-fertile segregates with *G. harknessii* cytoplasm. They carry fertility-restorer genes from *G. harknessii*; the restorer genes are necessary to produce fertile anthers in any stocks with *G. harknessii* cytoplasm. Crosses of Upland varieties to these stocks produce completely male-sterile plants and progeny whenever the restorer genes are all replaced by their Upland alleles. Consequently, selection for male fertility will be necessary for developing self-fertile transfer lines from these germplasm lines. On the other hand, male-sterile lines derived from them can be maintained without specially bred maintainer or B-lines, since apparently all Upland varieties lack fertility-restorer genes for this cytoplasm.

DES-HAMS 16 and 277 are male-sterile lines with *G. harknessii* cytoplasm. Under Mississippi conditions they produce 100% male-sterile progenies from crosses with Upland varieties. Crossing with pollen from the DES-HAF germplasm lines produces partially or entirely male-fertile progenies.

DES-LONG 16 and 277 originated from a parent stock which carried a highly variable male sterility. Unlike the other germplasm lines included in this release, these stocks have been selected for fertility during the backcrossing program. In crosses involving this cytoplasm, some Upland varieties produce much more vigorous progenies than others. In spite of significant overall reduction of vigor (when *G. longicalyx* cytoplasm progenies are compared with their Upland cytoplasm counterparts), their productivity is adequate for maintaining a transfer program.

DES-BARB 16 and 277 and DES-TOM 16 and 277 are highly productive germplasm lines with cytoplasm from *G. barbadense* and *G. tomentosum*, respectively. All of these stocks are very similar to parent varieties in yield, agronomic characteristics, and fiber properties.

REGISTRATION OF FIVE SOYBEAN GERMPLASM POPULATIONS

(Reg. No. GP 13 to GP 17)

W. R. Fehr and R. C. Clark

Five soybean (*Glycine max* (L.) Merr.) germplasm populations, AP1, AP2, AP3, AP4, and AP5, were developed cooperatively by the Iowa Agriculture and Home Economics Experiment Station and the Agricultural Research Service, USDA. The populations were developed to increase genetic variability by incorporating plant introductions into breeding populations and by intermating to break up linkage blocks (5, 6). The experiments will be used to evaluate the effect that different dosages of exotic germplasm have on breeding populations. They are being released to soybean breeders for additional selection.

The five populations were developed from four plant introductions, two cultivars, and two unreleased experimental lines. PI 81029 and PI 86704 were selected for their good yield potential. PI 91130 and PI 86060 had the best yield response to applied phosphorus among 355 soybean cultivars and plant introductions evaluated in Iowa (2, 4). PI 86704 and PI 91130 have the gene *Dd*, that controls stem termination (1). 'Chippey 64' and 'Calidad' were the two commercially grown cultivars used. The experimental lines were C1426, a sister line of Caland, and L15, a derivative of the 'Wayne' cultivar (Wayne × Clark 65). The two cultivars and two experimental lines represented high-yielding genotypes with resistance to race 1 of *Phytophthora megasporangia* var. *sojae*.

The derivation of the five populations is illustrated in Fig. 1. AP2 and AP4 had one backcrossing generation to obtain 75% of the cytoplasmic male-sterile stock backcrossed to Delapine 16 and Delapine 277, respectively.