REGISTRATION OF THREE GROUP HI MATURITY
INSECT-RESISTANT SOYBEAN GERMPLASM LINES:
MBB 80-133, L86K-73, AND L86K-96

SOYBEAN [Glycine max (L.) Merr.] germplasm lines MBB 80-133 (Reg. no. GP-138, PI 559364), L86K-73 (Reg. no. GP-139, PI 559365), and L86K-96 (Reg. no. GP-140, PI 559366), with resistance to the Mexican bean beetle (Epilachna varivestis Mulsant) and other foliar feeding insect pests, were jointly developed and released in August 1990 by the USDA-ARS and the agricultural experiment stations of Illinois, Maryland, and Purdue University.

MBB 80-133, L86K-73, and L86K-96 are from a second cycle of selection in which improved germplasm lines with Mexican bean beetle resistance previously developed in our first cycle of selection (1), containing one of two maturity Group VII introductions from Japan (PI 171451 or PI 229358), served as the source of insect resistance. These three lines from our second cycle of selection are earlier in maturity and produce higher yields than currently available insect-resistance soybean germplasm. Insect resistance is equal to that of previously released lines and nearly equal to that of the original sources of resistance (2). All three lines are of Group III maturity, equal to or earlier than the cultivar ‘Williams’ (3), have indeterminate stems, normal erect pubescence, white flowers, and tan pods. MBB 80-133 and L86K-96 have yellow seed with black hila and brown pubescence. L86K-73 has yellow seed with yellow hila and gray pubescence. Large-scale field testing for resistance to the Mexican bean beetle and other foliar feeding insects was carried out at several locations in Maryland and Indiana from 1984 to 1989. Laboratory foliar-feeding studies with the Mexican bean beetle on field-grown leaves were conducted in Illinois from 1985 to 1989. Agronomic performance was evaluated at multiple locations in all three states from 1984 to 1989.

MBB 80-133 is a selection from the cross ‘Union’ (4) × L76-0038 (Williams × PI 171451). This line originated from a single plant in the F2 generation. The F2 generation was advanced in bulk and the F3 and F4 generations advanced by pedigree selection. Generation advances were made in Maryland, with selection for resistance to Mexican bean beetle feeding damage, improved agronomic characteristics, and early maturity. Subsequent testing of this line demonstrated 53% less Mexican bean beetle feeding damage in the field, 62% less Mexican bean beetle foliage consumption in the laboratory, and 14% less seed yield, in the absence of insect damage, than the Mexican bean beetle susceptible cultivar Williams.

L86K-73 is a selection from the cross L73-4673 × L76-0132 (‘Beeeson’ (5) × PI 171451). L73-4673 is from ‘Corsoy’ (6) × L66L-154 [‘Wayne’ (7) × L57-0034 (Clark × Adams) (8,9)]. This line originated from a single plant in the F2 generation. The F2, F3, and F4 generations were advanced in bulk and the F4 generation advanced by pedigree selection. Generation advances of L86K-73 were made in Illinois, with selection for early maturity and improved agronomic characteristics. The F5 and F6 generations were also tested in Indiana and Maryland for insect resistance. Subsequent testing of this line demonstrated 51% less Mexican bean beetle feeding damage in the field, 55% less Mexican bean beetle foliage consumption in the laboratory, and only 4% less seed yield than Williams in the absence of insect damage.

L86K-96 is a selection from the cross ‘Williams 82’ (10) × L76-0279 (Williams × PI 229358), which was advanced to the F4 generation in a fashion similar to L86K-73. Subsequent testing of L86K-96 demonstrated 45% less Mexican bean beetle feeding damage in the field, 43% less Mexican bean beetle foliage consumption in the laboratory, and 10% less seed yield than Williams in the absence of insect damage.

The three Mexican bean beetle resistant lines have also demonstrated varying levels of leaf feeding resistance to the bean leaf beetle [Ceratoma trifurcata (Forster)] and the Japanese beetle (Popillia japonica Newman) in field studies and to the corn earworm (Helicoverpa zea (Boddie)), soybean looper (Pseudoplusia includens (Walker)) and the velvetbean caterpillar (Anticarsia gemmatalis) in greenhouse studies. These early maturing, foliar-insect feeding resistant lines are expected to be of value to soybean breeders developing cultivars for the northern USA.

A seed packet (50 seeds, more if available) of each will be supplied upon written request to R.L. Bernard, Dep. of Agronomy, Univ. of Illinois, W-321 Turner Hall, 1102 S. Goodwin Ave., Urbana, IL 61801. It is requested that appropriate recognition be made if this germplasm contributes to the development of a new cultivar or when research is published using these lines.

T. C. ELDEN,* R. L. BERNARD, M. KOGAN, C. G. HELM, AND L. W. BLEDSOE (11)

References and Notes