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### REGISTRATION OF SIX PEANUT GERmplASMS LINES WITH MULTIPLE RESISTANCE

Six peanut (*Arachis hypogaea* L.) germplasm lines (Reg. no. GP-42 to GP-47) were released in 1986 by USDA-ARS in cooperation with the Virginia Agricultural Experiment Station. VGP 2 (PI 509536), VGP 3 (PI 509537), VGP 4 (PI 509538), VGP 5 (PI 509539), and VGP 6 (PI 509540) (Reg. no. GP-42 to GP-46, respectively) have moderate levels of resistance to *Sclerotinia minor* Jagger, the causal organism for Sclerotinia blight (5), and to *Cercospora arachidicola* Hori and *Cercosporidium personata* (Bert. & Curt.) Deighton, the causal organisms of early and late leafspot, respectively (6). VGP 7 (PI 509541) (Reg. no. GP-47) has moderate levels of resistance to *S. minor* (5) and southern corn rootworm (*Diabrotica undecimpunctata howardi* Barber) (4). Sclerotinia blight is currently one of the most damaging peanut diseases in the states of Virginia, North Carolina, Texas, and Oklahoma. Chemical control of leafspot currently increases production costs about 10% in the USA. Southern corn rootworm is one of the major soil insect pests of peanut in the Virginia-Carolina production area. The release of these germplasm lines should enhance the development of cultivars with multiple resistance and high yields.

VGP 2, VGP 3, VGP 4, VGP 5, and VGP 6 (experimental no. VA 732813, VA 732815, VA 732816, VA 732817, and VA 732818, respectively) are pure line selections made in the F<sub>3</sub> generation of a cross between Chico (1) and 'Floriant' (3). VGP 7 (experimental no. VA 751014) is a pure line selection made in the F<sub>3</sub> generation of a cross between GP-NC343 (2) and a selection from PI 319178. These germplasm lines are all large-seeded Virginia-type peanuts and have a spreading bunch growth habit, except VGP 7, which is spreading. VGP 7 has a tan seed testa, while the other germplasm lines have a pink testa. Grade characteristics, seed size, and yield are similar to Floriant, except for the percentage of extra large kernels (undamaged seed that ride a 0.85 × 2.54-cm slotted screen), which is high compared to Floriant. All lines mature slightly later (5 to 10 days in Virginia) than Floriant. Most of the pods are two-seeded and similar to Floriant in shape. Quality and processing characteristics are similar to Floriant, except for lower blanchability. These germplasm lines are unacceptable commercially due to their late maturity and poor blanchability.

Limited quantities of seed are available for distribution to peanut breeders and geneticists upon written request to the Tidewater Agricultural Experiment Station, Suffolk, VA 23437.

T. A. COFFELT, D. M. PORTER, J. C. SMITH,  
AND R. W. MOZINGO (7)

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### REGISTRATION OF EARLY MATURING, MARKER GENE, AND STEM ROT RESISTANT GERmplASMS LINES OF RICE

ONE early maturing and four marker gene lines of rice [*Oryza sativa* L.] (Reg. no. GP-54 to GP-58) were developed from induced mutations. One selection (Reg. no. GP-59) for resistance to the fungal disease stem rot (caused by *Sclerotium oryzae* Catt.) was developed by hybridization and pedigree breeding.

PI 506219 (Reg. no. GP-54) is an induced mutant for early maturity (experimental designation Early S-201) that was selected at Davis, CA in 1982, from the M<sub>2</sub> generation of irradiated 'S-201'. The parent cultivar has been described (1). Following overwinter generation advance, PI 506219 was found to head 6 days earlier than its parent in 1983. In a small plot replicated yield test in 1984, PI 506219 was 7 days earlier, yielded 25% more (probably due to less low temperature induced sterility than for the later heading parent), and had 3% smaller kernel weight than its parent (Table 1). Grain shape was less-rounded than that of its parent, making the grain somewhat intermediate between typical short and medium grain types. Except for earlier maturity and slightly different grain shape, PI 506219 is otherwise similar to its semidwarf parent.

PI 506221 (Reg. no. GP-55) is an induced mutant for light green panicle and leaf color (experimental designation light green panicle M-101) that was selected at Davis, CA in 1980, from the M<sub>3</sub> generation of irradiated 'M-101'. The parent cultivar has been described (6). The light green panicle color of PI 506221 is particularly noticeable for a 2-week period beginning at heading. Mature panicle and hull color are indistinguishable from the M-101 parent. When PI 506221 was crossed to a normal panicle color line, the F<sub>2</sub> segregation ratio, based on F<sub>3</sub> progeny tests, of 98:219:127 homozygous normal to heterozygous to homozygous light green panicle fit a single recessive gene model (1:2:1; 0.50 < P < 0.75).

Table 1. Days to heading, yield, and 100-kernel weight of PI 506219 (Early S-201 mutant) and its parent, S-201.

Genotype	Days to heading	100-kernel weight	
		Grain yield†	g
PI 506219 (Reg. no. GP-54)	93	1083	2.34
S-201	100	869	2.42
LSD <sub>0.05</sub>	1	68	0.04

† Plot size was 1.2 m<sup>2</sup>.

**Table 2. Days to heading and yield of four marker gene mutants in M-101 and a genetically similar line, ESD7-3, grown at Davis in 1983.**

Genotype	Days to heading	Yield†, g m <sup>-2</sup>
M-101 (check)	90	1063
PI 506221 (light green panicle M-101)(GP-55)	91	1047
PI 506222 (yellow-green panicle ESD7-3)(GP-56)	88	1048
PI 506223 (waxy M-101)(GP-57)	90	1063
PI 506224 (goldhull M-101)(GP-58)	91	942
LSD <sub>0.05</sub>	1	58

† Plot size was 0.6 m<sup>2</sup>.

The gene conditioning light green panicle is designated *lgp* (4). In a small-plot replicated yield test, PI 506221 did not differ significantly in yield from its M-101 parent, but was 1 day later in heading (Table 2). Except for its light green panicle and leaf color, PI 506221 is otherwise similar to its semidwarf parent.

PI 506222 (Reg. no. GP-56) is an induced mutant for yellow-green panicle and leaf color (experimental designation yellow-green panicle ESD7-3) that was selected at Davis, CA in 1979, from the M<sub>3</sub> generation of irradiated experimental selection ESD7-3. The parent is an early maturing, semidwarf, glabrous hull selection from 'CS-M3'/'Calrose 76'/'CI 11037. CS-M3, Calrose 76, and CI 11037 have been described (3,5,7). ESD7-3 was never released but except for being 3 days later, it is genetically very similar to the cultivar M-101. When PI 506222 was crossed to a normal panicle color line, the F<sub>3</sub> progenies of heterozygous F<sub>2</sub> plants segregated 844:302 normal to yellow-green panicle, providing a satisfactory fit to a single recessive gene model (3:1; 0.25 < P < 0.50). The gene conditioning yellow-green panicle is designated *yp* (4). In a small-plot replicated yield test, PI 506222 did not differ significantly in yield from the M-101 check, but was 2 days earlier (Table 2).

PI 506223 (Reg. no. GP-57) is an induced mutant for waxy endosperm (experimental designation waxy M-101) that was selected at Davis, CA in 1979, from the M<sub>2</sub> generation seeds (on M<sub>1</sub> plants) of irradiated M-101. PI 506223 carries the recessive *wx* gene for near-zero amylose content. In a small-plot replicated yield test at Davis in 1983, PI 506223 did not differ significantly in yield or maturity from its parent (Table 2). When PI 506223 was crossed to a normal translucent grain line, the F<sub>2</sub> grains segregated 581:177 normal to waxy endosperm, providing a satisfactory fit to the expected single recessive gene model (3:1; 0.25 < P < 0.050). Brown rice grain weight of PI 506223 was 2.07 ± 0.03 g/100 grains, compared to 2.25 ± 0.02 for M-101. Except for waxy endosperm and 8% smaller seed size, PI 506223 is otherwise similar to its semidwarf parent.

PI 506224 (Reg. no. GP-58) is an induced mutant for goldhull color (experimental designation goldhull M-101) that was selected at Davis, CA in 1981, from the M<sub>3</sub> generation of irradiated M-101. The goldhull mutant has the same hull color as the goldhull cultivars previously used in the southern USA, which carried the gene *gh* but genetic studies on this mutant have not been conducted. In a small-plot replicated yield test at Davis in 1983, PI 506224 was significantly lower yielding than its parent, but not significantly different in maturity (Table 2). Except for goldhull color and lower yield, PI 506224 is otherwise similar to its semidwarf parent.

PI 506229 (Reg. no. GP-59) is an F<sub>9</sub> generation line (experimental designation D16) derived from an F<sub>3</sub> plant selected for resistance to stem rot (caused by *Sclerotium oryzae* Catt.) from the cross M-101/*O. rufipogon* W. Griffith A100912. *Oryza rufipogon* A100912 is a weedy species entry from the International Rice Research Institute. In California tests, *O. rufipogon* A100912 has shown more resistance to

stem rot than the most tolerant entry of cultivated rice recognized in 1981, *O. sativa* 'Colusa'. For example, the disease index (1 = immune, 5 = highly susceptible) for *O. rufipogon* A100912 was 3.0, compared to 4.0 for M-101 and 3.7 for Colusa (LSD<sub>0.05</sub> = 0.4) (2). Aside from being stem rot resistant, *O. rufipogon* A100912 has many undesirable features—prostrate growth habit, photosensitivity, shattering, and red pericarp. PI 506229 was selected for recombination of disease resistance and improved plant type. It has shown good resistance to stem rot in repeated trials at Biggs during the last several years. Plant height and heading dates of PI 506229, as determined in a nondisease nursery at Davis in 1986, were: plant height—72 ± 1 cm, compared to 84 ± 3 cm for M-101; heading date—105 ± 0 days compared to 90 ± 0 for M-101. About 96% of the grains of PI 506229 have red pericarp, which is undesirable except for specialty markets. PI 506229 has pubescent leaves and hulls.

These germplasm lines were released 1 Mar. 1987 by USDA-ARS, the California Co-operative Rice Research Foundation, and the California Agricultural Experiment Station. Germplasm amounts of seed (<10 g) of the above lines may be obtained by writing to: Germplasm Resources Laboratory, USDA-ARS, Bldg. 047, BARC-West, Beltsville, MD 20705.

J. N. RUTGER, R. A. FIGONI, R. K. WEBSTER, J. J. OSTER,  
AND K. S. MCKENZIE (8)

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#### REGISTRATION OF SHORT STATURE, EARLY MATURING, AND WATER WEEVIL TOLERANT GERMPLASM LINES OF RICE

FOUR short stature lines of rice [*Oryza sativa* L.] (Reg. no. GP-60 to GP-63) were developed by induced mutation. One early maturing line (Reg. no. GP-64) was developed from spontaneous mutation. One selection (Reg. no. GP-65) for tolerance to rice water weevil (*Lissorhoptrus oryophilus* Kuschel) was developed by hybridization and pedigree breeding.

PI 506225, PI 506226, PI 506227, and PI 506228 (Reg. no. GP 60 to GP-63) are induced mutants (experimental designation 78Y81, 78Y454, 78Y455, and 78Y458), for short stature that were selected at Biggs, CA in 1976 from the M<sub>2</sub> generation of irradiated CI 11032. CI 11032 is a long grain