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1) Mosaic resistant and susceptible soybean lines.

Isolines of soybeans are useful tools to study various interactions under field conditions. The purpose of this communication is to report the pending release of four pairs of mosaic resistant and susceptible soybean lines. These pairs of lines can be used in a variety of investigations dealing with soybean mosaic virus, and the resistant lines can serve as genetical material for plant breeders as sources of mosaic resistance.

Each resistant and susceptible sibling pair was selected as F_3 plants from the same F_2 plant from the second or third backcross to the recurrent mosaic-susceptible parent. Resistance, controlled by a single dominant gene, Rsv (Kiihl, 1976), was obtained from soybean PI 96,983 from Maturity Group V of the soybean germplasm bank (Ross, 1969a).

The lines and their pedigrees are presented in Table 1. The lines have been used to study the effect of soybean mosaic virus on soybean yields (Ross, 1977). Results of field experiments with these lines have indicated among other things that (1) cv 'Dare', although infected by mosaic virus, possesses a field resistance to mosaic not present in 'Semmes', 'Pickett 71' or 'Lee 68'; (2) yields from Semmes may be reduced up to 39% by mosaic and yields of Lee 68 and Pickett 71 reduced 20-30%; (3) incorporation of mosaic resistance into soybean cultivars would be a worthy addition where mosaic is present. Average yield in the presence of soybean mosaic virus of the susceptible line from each pair was not significantly different (< ± 4.5%) from yields of their respective recurrent parent in 1976 field tests at Plymouth, NC.

Table 1

Pedigrees of mosaic resistant (R) and susceptible (S) isolines released

Line designation	Pedigree
NC-DMS NC-DMR	[(Dare x PI 96983) x Dare x Dare] x Dare
NC-SMS NC-SMR	[{(Semmes x PI 96983) x Semmes} x Semmes] x Semmes
NC-PMS NC-PMR	[[{(Dare x PI 96983) x Dare} x Pickett 71] x Pickett] x Pickett 71
NC-LMS NC-LMR	[{(Lee 68 x PI 96983) x Lee 68} x Lee 68] x Lee 68

All pairs appear to have similar agronomic characters and disease reactions as those of the recurrent parent. Hence, NC-PMS and NC-PMR are resistant to Race 1 of Heterodera glycines, the soybean cyst nematode, as is Pickett 71. Since resistance to bean pod mottle virus has not been identified in the soybean germplasm, mosaic-resistant cultivars would not sustain the synergistic yield losses caused by double infection of pod mottle virus and mosaic virus (Ross, 1968, 1969b). Approximately 100 seed of each line may be obtained from J. P. Ross upon request.

References

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1) Effects of light on soybean leaf chlorophyll content--The role of the Y_{11} gene.

Previous studies on the genetics of chlorophyll production have revealed the involvement of a gene Y_{11}, which is incompletely dominant. Thus, three phenotypes may be observed--plants with leaves that are normally pigmented, light-green or yellow. The yellow is a lethal in nature; however, we have propagated them under laboratory conditions either by grafting the yellows to wild-type plants or growing them independently under constant low-level illumination with a short period of moderate (400 ft-c) illumination each day. Under the low light conditions, the presence of considerable chlorophyll is evident in the leaves of these yellow plants (Noble et al., 1977). Such plants are capable of sufficient CO_2 fixation to survive and grow at a reduced rate.