

Selection in Snap Bean Breeding Lines for Romano-type Characters

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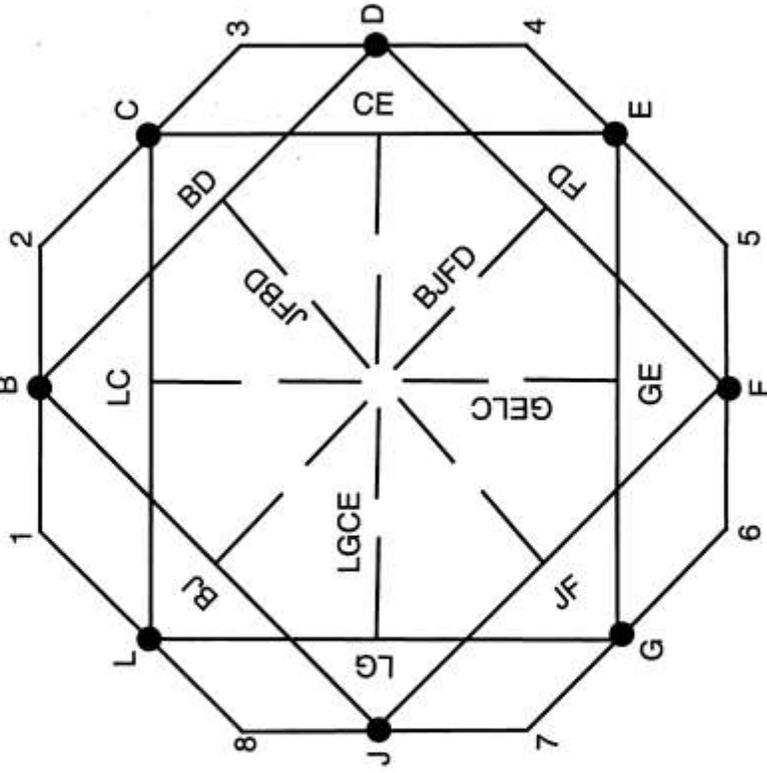
Objectives of our snap bean breeding program are limited to the development of Romano-type cultivars and include selection for cultivars with: 1) tolerance to lodging, 2) pod types similar to industry standards, 3) tolerance to root rot diseases, especially *Pythium* spp. and *Rhizoctonia solani*, and 4) yields as good as or better than industry standards.

Several crosses were made using Romano-type and round-podded snap bean cultivars to improve the strength of the main stalk of plants and to develop a more upright bush which would remain standing with a full pod load. These lines are now in advanced stages of development and seed supplies are being increased in the greenhouse for area-wide trials. These lines have also been tested for tolerance to root rot diseases in plots known to have high levels of several root-rotting pathogens and have displayed an above-average tolerance to these diseases.

A second round of crosses have been made using a Conical Cross Population breeding system which maximizes the number of recombinant offspring in segregating generations. An outline of the system along with the parent cultivars, advanced breeding lines and plant introductions used is shown in Figure 1. Parents which form the population are represented by numbers at the corners of the octagon and were crossed together as shown. The resulting F₁ progeny represented by single letters between each parent were then crossed with each other as outlined. Final crosses between offspring represented by double letters were made, resulting in four diverse populations which should have maximum opportunities for recombinations in a segregating population. The fourth generation (F₄) from this crossing scheme was planted in the field at Jackson in 2001 and selections were made for pod width and tolerance to lodging. Seed increases from these selections will be made in the greenhouse during the winter of 2001-2002 and planted in the field in the spring of 2002.

Average pod width measurements of selections made in 2001 from five promising breeding lines are compared with two commercial Romano-type cultivars in Figure 2. Pod width of the breeding lines was comparable to >Roma II= and >Romano 942=. All of the selections were upright plant types with pods held off the ground and pod widths comparable to the common.

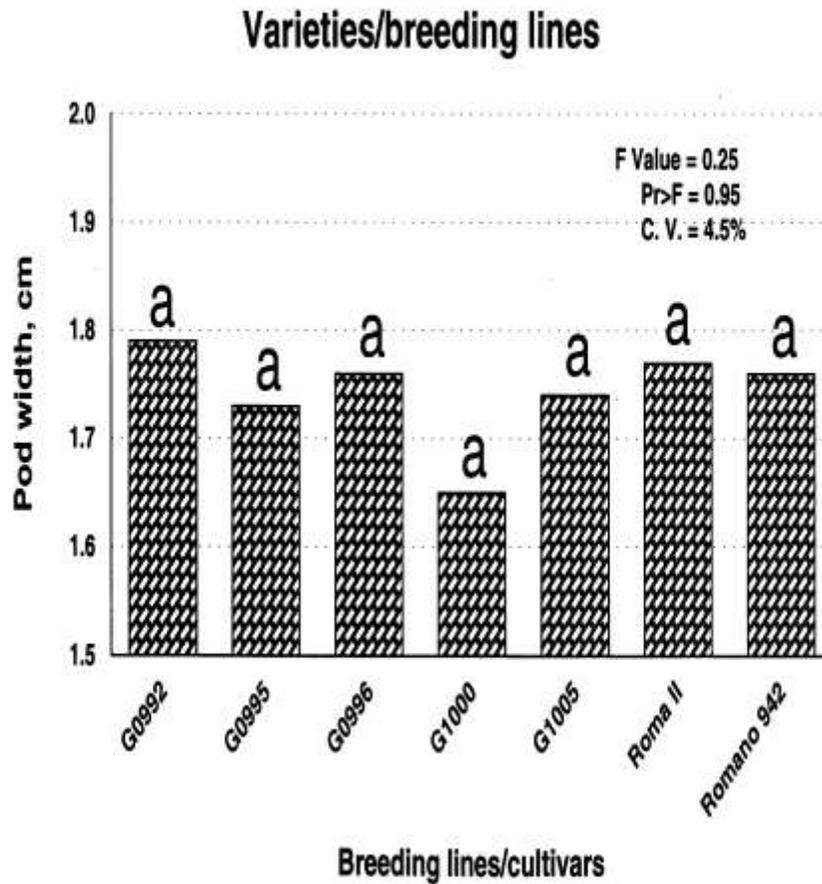
Fig. 1. Conical Cross Population Breeding System for Bush Romano Beans



Entries

- 1 Roma II
- 2 Labrador
- 3 Romano 942
- 4 Peak
- 5 RS 1801
- 6 Benton
- 7 PI 549720
- 8 Brío

Fig. 2. Pod width distribution



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This research represents one season's data and does not constitute recommendations. After sufficient data is collected over the appropriate number of seasons, final recommendations will be made through research and extension publications.