

## GENETIC PROGRESS IN COMMON BEAN AFTER FOUR CYCLES OF RECURRENT SELECTION

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The objective of this study was to estimate the genetic progress in a recurrent selection program with common bean that started in 1990 at the Universidade Federal de Lavras. The program was designed to develop new inbred lines with carioca grain type and high yield.

The base population was obtained from the following parents: Bat 477; IAPAR 14; FT 84-29; Jalo; A 252; A 77; Ojo de Liebre; ESAL 645; Pintado; Carioca. The parents were crossed in diallel scheme to obtain the bi-parental hybrids which were then crossed to generate double hybrids. One hundred and fifty seeds from the F<sub>2</sub> generation of each double hybrid with ideal grain type were joined to form the original Cycle I (CI) population (S<sub>0</sub> generation). The breeding program followed the methodology schematically shown in Figure 1, until Cycle IV (CIV) lines were obtained.

A total of 20 inbred lines, five best lines from each selection cycle were selected to assess the recurrent selection efficiency. These 20 lines and the control Pérola cultivar were sown in July 2002 in Ijaci, MG, Brazil (latitude 21°13'S, 915 altitude) for assessment. A randomized complete block design with five replications was used, with plots formed by two four-meter long rows. The between row spacing was 45cm and 15 seeds were sown per linear meter of row.

Data collected were yield in grams/plot and grain type in a scale of scores ranging from 1 to 5, where: 1 – typical carioca grain, cream colored with light brown stripes, pale base, without corona, mean weight of 100 seeds of 22 to 24 g, grains not flattened and 5 – cream colored grain with dark brown stripes, dark base, with corona, mean weight of 100 seeds less than 22g, flattened grains. These data were submitted to analysis of variance. The family means in each cycle were used to estimate the progress from selection by the least squares method.

The mean yield of the best five lines in each cycle increased with selection. The estimated coefficient of linear regression was positive and different from zero ( $b=77.7$  g/plot and  $R^2=94.7\%$ ). This result showed that the genetic progress was 77.7 g/plot per cycle, which corresponds to 7.4% of the mean yield of the lines in the first cycle.

The grain type scores also improved with selection. The estimated coefficient of linear regression was  $b= -0.32$ , which indicated progress from selection of 10.5% over the means of the families in the original cycle.

It must be emphasized that the recurrent selection method allowed the introduction of lines from other programs for recombination. This allowed a much more dynamic process that capitalized over the genetic progress obtained in other programs. Therefore, the progress from selection in both characteristics was in part due to the lines introduced for recombination at each cycle. However, the greatest progress proportion, without any doubt, should be attributed to the recurrent selection program.

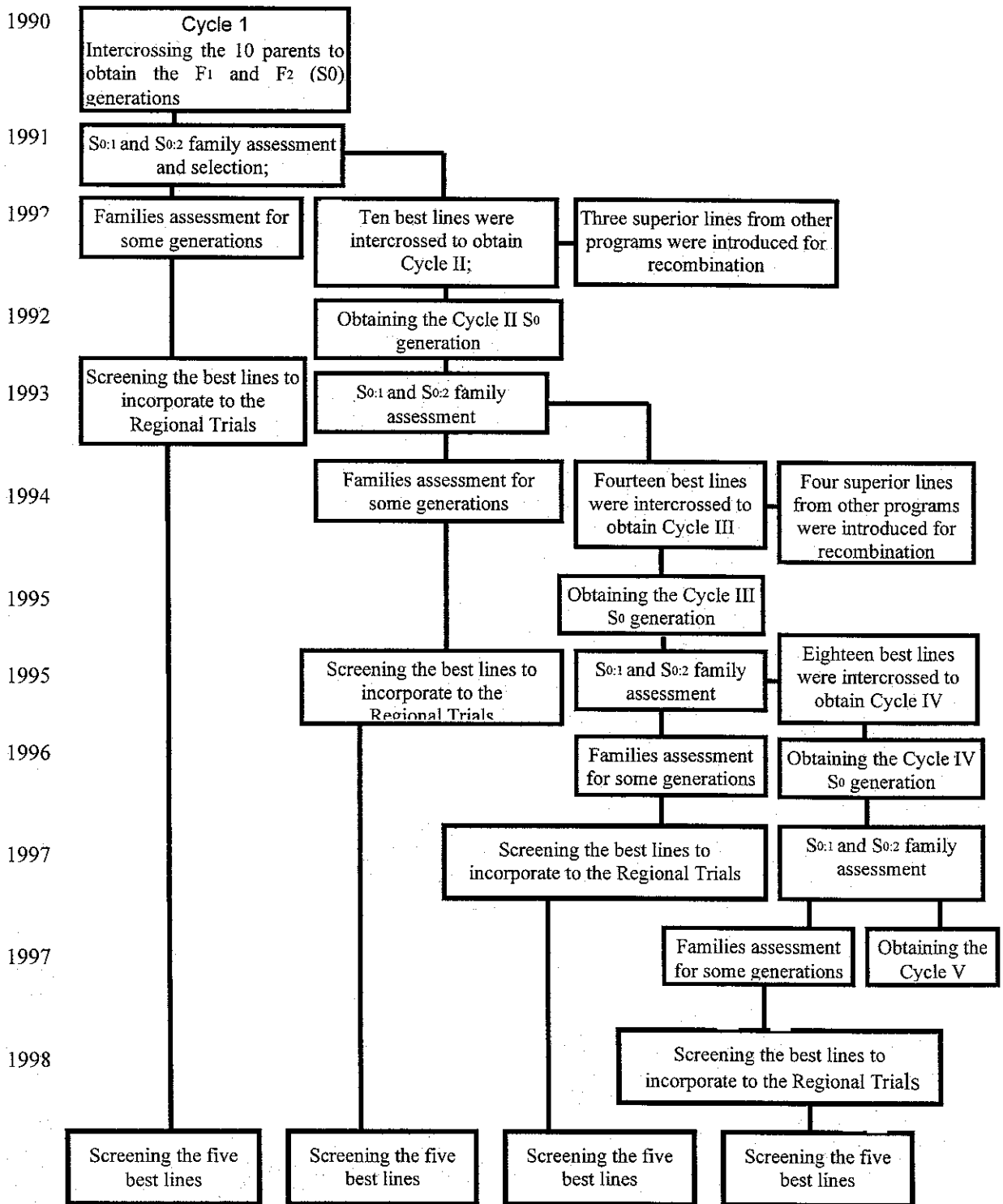


Figure 1. Recurrent selection method used to breed common bean.