

An Approach to Reduce the Time Required for Bean Yield Evaluation in Coffee Breeding

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ABSTRACT

Efficiency of plant breeding programs, particularly in perennial crops, may be improved by reducing time required for evaluation prior to selection. The objective of this work was to study expected selection responses of several variables based on partial bean yields compared to total accumulated bean yield of coffee (*Coffea arabica* L.) over the first 48 months of production. One hundred thirty-eight F₅ families of a cross between *C. arabica* cv. Caturra and Timor hybrid were randomly distributed among four experiments transplanted in 6x6 simple lattice designs. Beans were harvested monthly, by hand, from each tree. Fresh be yield was determined for each tree on 48 harvests over a 4-year period. Sixty-eight variables were created from bean yield data collected over the 48 harvests. Inheritability was estimated on a family mean basis from components of variance for each variable. Direct selection response for total yield (R) as well as correlated response for total yield (CR), due to selection for a correlated variable, were also computed. The CR/R ratios exceeded 100% for accumulated bean yield of all harvests after 32 months of age in each experiment. Confidence interval estimates (95% level) of mean CR/R or mean age at which CR/R exceeded 100% suggested an optimum age of 36 months. Selection for accumulated bean yield at 36 months-of-age was estimated to be 37% more efficient, per year, as selection at 69 months-of-age. The only other variable with potential as an efficient selection criterion was accumulated bean yield for the 5 months of typically maximum bean production during the first 2 years.