

On computer programs for teaching animal breeding

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Introduction

It was proposed by Nicholas (1987) that a catalogue of teaching and extension software could become a regular feature of A.A.A.B.G. proceedings. This was given general support in a plenary session at the 1987 meeting in Perth.

This note briefly describes a simple program which can be used to illustrate basic aspects of selection theory. Its value lies in graphic presentation both of animals' values for the trait of interest and of genetic and environmental trends.

A simple input screen allows the user to accept or alter default values for the size of the population of candidates, the number to be selected, the heritability of the trait, the standard deviation of the trait, and the standard deviation of year effects. A discrete generation model and a 1:1 mating ratio are assumed for simple presentation.

The figure shows an example output screen. Here the population size is 200, the standard deviation of year effects is 1 unit (kilograms in this example), and the other parameters are as shown. The results for each of five generations or years are built up progressively. For each year, a histogram of animal values is given and population means are plotted for observed value, genetic value and year effect ('Environmental trend'). The program is based on stochastic simulation, such that a second run using the same parameters will give somewhat different results - as in real life!

With no year effects, the program can be used to illustrate the concepts of random variation in merit, selection differential (the distance between ticks on the distribution scales), realised heritability, selection response, variation in response (especially with few parents). With year effects present, the masking of genetic trend by year effects is clearly demonstrated.

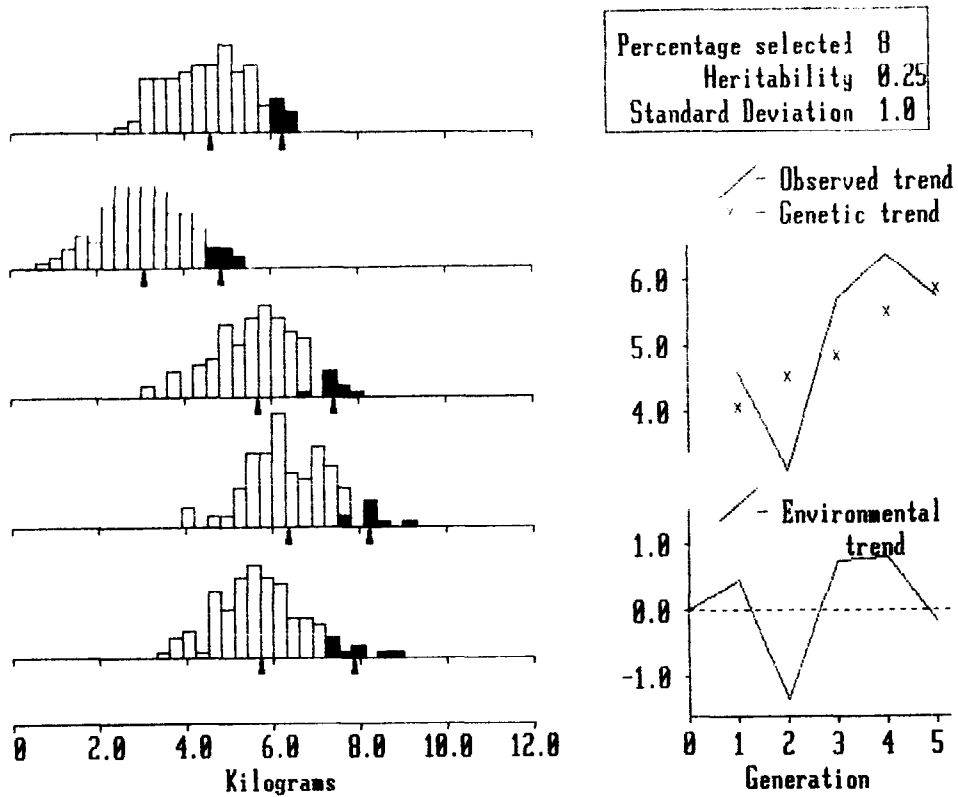


Figure: Example output from the program SEL.BAS.

Experience has shown that graphic representation of concepts can be much more effective in teaching than use of numerical examples. Simple programs are being written to help teach other aspects of animal breeding. These are available on your MS-DOS IBM disk from the author.

NICHOLAS, F.W. (1987). Proceedings of A.A.A.B.G., 6: 27- 30.