GENETIC CONTROL OF *MELOIDOGYNE INCOGNITA* RESISTANCE IN COMMON BEAN

F. B. SILVA[1], M.A. P. RAMALHO[1], A. de F. B. ABREU[2]. Universidade Federal de Lavras[1], Embrapa Arroz e Feijão[2].

One of the problems that most affects the common bean crop in Brazil is the increasing occurrence of nematodes, especially of the genus Meloidogyne. The damage done by these pathogens causes great loss, mainly where climatic conditions favor the reproduction and development of the nematodes, along with the intense exploitation same areas, without the due crop rotation.

There are several control methods, among them the chemical and management control which are however costly and little used. The principal alternative is the use of resistant cultivars. The occurrence of great variability among common bean lines in respect to damages has been documented (Moura & Regis, 1987; Mulliin et al (1991); Omwega & Roberts, 1992). Information regarding genetic control was obtained from plants in generation F_2. Since the evaluation of individual plants is of low precision, our study aimed at achieving information regarding the genetic control through progenies with a possibly greater experimental precision.

MATERIAL AND METHODS

Progenies $F_{2:3}$ of the crossing Pérola (resistant) x Batatinha (susceptible) were used. Sixty-eight $F_{2:3}$ families plus both parents were evaluated in the complete randomized block design with three replications. The plots consisted in a pot with two plants. Additionally, a (susceptible) tomato plant was grown in each pot as an indicator for the occurrence of nematodes. Each plot was inoculated after the emergence with 6000 *M. incognita* eggs. Sixty days after the emergence the incidence of the egg mass in the roots was evaluated.

The analysis of covariance was realized using the number of egg mass of the tomato plant as covariable.

RESULTS AND DISCUSSION

By means of the tomato indicator plant a variation in the nematode incidence was observed between pots, reducing the evaluation precision. However, the use of this information as covariable adjusted them all to a mean incidence, improving the precision (Steel et al 1997). Significant difference ($P \leq 0.01$) was detected among the progenies. The frequency distribution of the number of egg mass evidenced this fact (Figure 1). The contrasting performance of the parents was noteworthy. The resistance of cultivar Pérola is probably one of the reasons for the good performance in several regions of Brazil, especially in center-pivot irrigation systems.

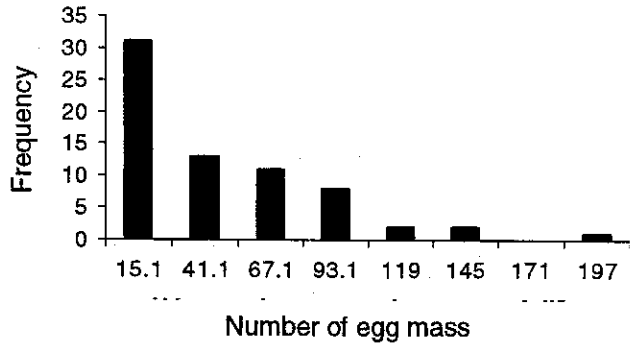

Figure 1. Frequency distribution of M. incognita egg mass number

An asymmetric frequency distribution was observed. There is a greater concentration of families in the classes of smaller occurrence of egg mass. This fact indicates the occurrence of dominance in the control trait, where the dominant allele(s) is(are) responsible for the resistance. These results are in agreement with earlier studies that evaluated F_2 generation plants. It is difficult to draw conclusions on the number of genes. The number is probably low, as reported earlier by Owmega et al 1992. However, the obtained estimates of heritability (h^2 = 53.6%) are evidence that the environment effect is pronounced which may affect the success of the selection for this trait

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