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THE RELATIVE IMPORTANCE OF THE CHARACTERS IN THE STUDY OF THE GENETIC DIVERSITY OF COMMON BEAN

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INTRODUCTION

The genetic diversity present in local and improved bean cultivars allows exploring an existing variability already adapted to the specific climatic conditions, contributing a lot to breeding programs. Morphoagronomic characteristics are considered of great importance, since they allow the direct evaluation of agronomic interest characters. The analyze of the relative importance of the characters makes it possible to discard characteristics that contribute less to the discrimination of the evaluated materials, reducing costs and labor in the next experiments, being that the minor importance characteristics may be those that show less variability or that are represented by other one (Cruz, Regazzi e Carneiro, 2012). The present work had the objective of accessing the genetic variability of common bean cultivars and identify the characteristics of greater relative importance.

MATERIAL AND METHODS

Thirty-nine bean cultivars were used for the characterization, 20 belonging to the carioca commercial group and 19 to the black commercial group (tests were performed independently for each commercial group). All cultivars come from breeding programs of public or private institutions from Brazil. The trials were established in four environments in the state of Paraná-BR, two in the 2014/2015 rainy season, in Ponta Grossa and Guarapuava, and two in the dry season of 2015, in Ponta Grossa and Santa Tereza do Oeste. The experimental design was a randomized complete block with three replicates and plots consisting of four rows of 4 meters spaced 0.5 m, with a population of 12 plants per linear meter, considering the two central lines as a useful plot. The quantitative descriptors evaluated are on Table 1. The evaluations for the descriptors were carried out in a sample of ten plants of each experimental plot (except PROD), and for the statistical analysis the average of each plot was used. The relative importance of the quantitative variables studied was analyzed by the Singh method (Singh, 1981) using the Genes computational program (Cruz, 2013).

Table 1. Characteristics evaluated.

Abbreviation	Quantitative characteristics
LPL	Length of primary leaf
WPL	Width of the primary leaf
PLI	Primary leaf index
LCL	Length of central leaflet
WCL	Width of the central leaflet
CLI	Central leaflet index
LMS	Length of the main stem
IFP	Insertion of the first pod
NN	Number of stem nodes
LP	Length of the pod
SPOD	Number of seeds per pod
LP	Number of locules per pod
PP	Number of pods per plant
SP	Number of seeds per plant
TMS	Thickness of the main stem
LS	Length of seed
SW	Seed width
ST	Seed Thickness
WSP	Total weight of seeds in the plant
W1000	Weight of 1000 seeds
COEF J	Coefficient J=length/width (seed)
COEF H	Coefficient H=thickness/width (seed)
PROD	Production

RESULTS AND DISCUSSION

The characteristics that had greater relative importance according to the method proposed by Singh method in the carioca group were LMS, LS, LPL, WPL and WCL with 12.23, 11.24, 10.11 e 9.05%, respectively (Figure 1). For the black group the most important were SW, COEF J, LP and ST with 24.70, 17.44, 11.39 e 10.60%, respectively.

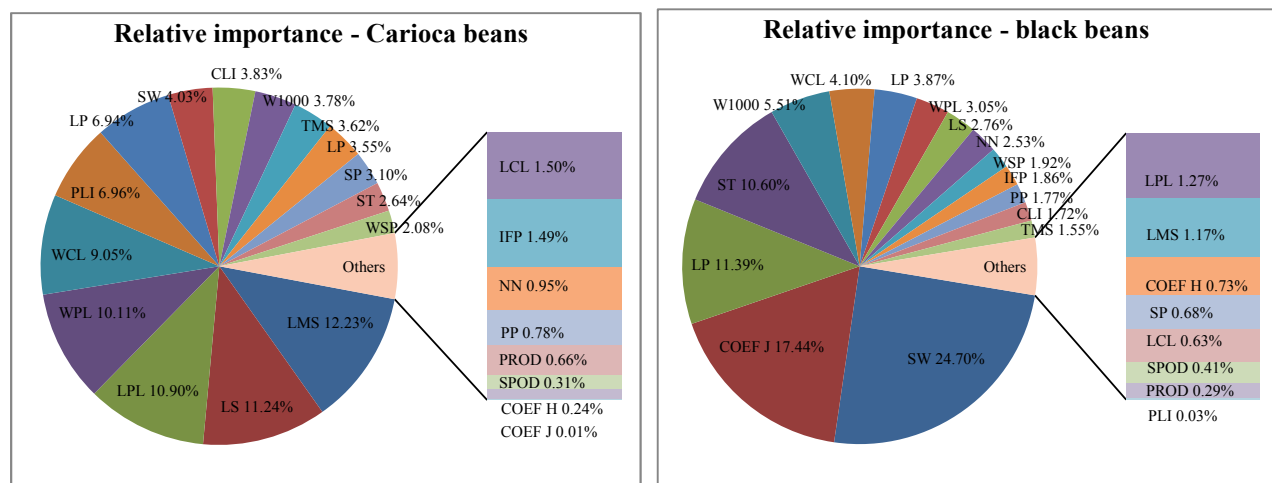


Figure 1 – Relative importance of the characters for carioca beans and black beans group.

The LMS characteristic was the most important variable in the Carioca group, probably due to the presence of plants of determined habit (Type I) among the studied cultivars, providing greater variability for this characteristic. In the black commercial group, the characteristics related to seed size were the most important, and have often been used to distinguish cultivars. Hegay et al., (2014) observed that the size of the seed was the characteristic that most contributed in the distinguishing of the genotypes studied by them. The PROD had low discriminant power in both groups, despite being an important commercial character. An explanation for this result is that the productivity averages did not show much variation. Other characteristics classified as not important also presented similar values between the cultivars evaluated or were correlated with characteristics of greater importance. It can be observed that few characteristics were more important, however these more important characteristics are not the same for the two commercial groups. The most important variables for the genetic divergence of cultivars of the black group are related to the seed, while in the carioca group the most important characteristics are related to the plant morphology. These results show that the most important characteristics for genetic divergence in one group of cultivars are not the same when evaluated in another group, suggesting that the results obtained cannot be extrapolated to different groups.

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