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MORPHOLOGICAL SEED TRAITS TO GRAIN YIELD SELECTION IN MAIZE: AN IMAGING TECHNOLOGY APPROACH

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RESUMO

Image technology has been used to select the best genotypes in breeding programs, in terms of grain yield potential and other related traits. This technology allowed to study the breeding population in all aspect of vegetative and reproductive stage with no destructive sample. Moreover, some traits like in seed stage, are difficult to measure, consume time and human resources. Thus, the aim of this study was to identify grain yield maize genotypes potential related to complex seed traits extract from image technology. For this, two experiment was carried out in lab and field condition. We used 10 commercial variety as genitors, 45 intervarietal hybrid diallels and five commercial variety as check. Complex seed traits as area, perimeter, diameter, solidity, eccentricity, and circularity were analyzed. The image collection was performed over four samples with 50 seed of each genotype and analyzed as RCBD mixed model design. In terms of field trails, the grain yield was evaluated in RCBD design. We performed the variance analysis and the genetic parameters as variance genetic, heritability and select accuracy for seed complex traits. The Blups was used to select the best genotype with the highest genotype value of the seed traits to compare with the grain yield assess in the field condition. We observed high genetic variability among traits obtained from image, suggesting that we have sensibility to perform selection of potential genotypes in still seed stage. It was observed high heritability (area = 0.91, perimeter = 0.85, diam = 0.91, eccentricity = 0.93, solidity = 0.49, circularity = 0.69) for all complex seed traits, apart from solidity, suggesting a complex gene control of this trait. We understand that large seeds could accumulated more energy reserve to provide a healthy seedling perform in terms of germination and allowed to tolerant the most important weather at the field condition. But large seeds depend on how those traits combining each other to give seed a healthy necessary to a good germination and such. The Blup allowed select commercial variety as a potential genitor that would be used in diallel cross screening. Among the 10 parents, five presented significant results for the characteristic analyzed and three intervarietal hybrid among the 45 analyzed. We observed high grain yield and best result for seed traits to G-53 and for G-44 (G-53 x G-55). The applied method was considered

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adequate for the identification of genotypes with higher inheritable potential for use in plant breeding.

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