Genetic analysis of yield related traits in landrace × commercial watermelon hybrids

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Abstract

Watermelon [*Citrullus lanatus* var *lanatus* L.] is a major xerophytic crop originating in Africa especially grown in subtropical and tropical parts of the world. However, few adapted varieties are available to promote greater yield and make watermelon a viable commercial crop of choice. Path analysis and combining ability was carried out for yield related traits among three popular local landraces; Landrace1, Landrace 2 and Landrace 3 collected in Zimbabwe and three commercial watermelon varieties 'Congo', 'Charleston Grey' and 'Crimson Sweet' in plots arranged in an RCBD replicated 3 times. A complete diallel mating design was used to generate 36 F_1 genotypes which together with the parents were evaluated for several quantitate traits. Data on correlations, path analysis, GCA and SCA between fruit yield and other traits were computed using Microsoft Excel and GenStat 17. Individual fruit weight (FIW) and the number of fruits per plant (NF) were found to be significantly linked with final fruit yield. Significant positive correlations were also observed on NF and number of female flowers (NFF), number of vines (NV), and FIW and these traits could be recommended as reliable selection indicators for creating high yielding watermelon genotypes. Path analysis showed that FIW and NF were the most important contributors to watermelon yield. GCA and SCA effects were significant and positive for yield which indicates that the traits are controlled by both additive and non-additive genes. 'Crimson Sweet' and 'Landrace 1' were the best pollen sources whereas 'Landrace 1' and 'Landrace 2' were the highest yielders when used as female parents. Overall, results from this study identified usable yield related proxies and need to incorporate local landraces germplasm in watermelon improvement.