

ABSTRACT

A Study of Morphophysiological Selection Criteria Related to Yield in Vegetable Cowpea [*Vigna unguiculata* (L.) Walp]

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Vegetable cowpea [*Vigna unguiculata* (L.) Walp], commonly referred to as bodie, is popularly grown in the Caribbean for its immature green pods consumed as a vegetable. Although a number of dwarf bodie genotypes have been developed in the Caribbean, the genotype and production systems have not been optimized to maximize yield and quality. The study seeks to understand the morphophysiological basis of yield development, so that appropriate selection criteria could be developed for breeding dwarf vegetable cowpea in the future under optimum conditions that can maximize yield and quality. The effects of genotype, plant density, season and harvesting regimes on growth, yield and pod quality were investigated in three studies. The effect of two densities were investigated in nine vegetable cowpea genotypes over four seasons in the first study, the effect of five planting densities on five genotypes over two seasons, in the next and the effect of four harvesting regimes in six genotypes over two seasons in the last. The September planting gave the highest yield compared to November, March or June plantings, reflected by an increase in harvest index. Response of fresh pod yield to increasing plant density was found to vary with genotypes and season with yield response in general being greater in the dry season than in the wet season. In contrast, genotype VRB3 performed better in the wet season than in the dry season. Genotype IT-83S-899, on the other hand, performed well in the dry season than in the wet season. Genotype VRB7 showed similar yield-density response and seemed to perform well at higher densities, in both seasons. Genotype VRB5 was able to produce high yields over a wide range of densities and showed the greatest plasticity. The studies also revealed that variation in yield in response to density is mediated through changes in pod number. Hence, a large number of clusters per plant was suggested as a selection criterion under high density conditions. Multiple harvesting increased yield, particularly at the F1Y (harvesting pods 9-10 days old every two days) regime. This led to increases in pod number, which in turn was associated with pod number per cluster in all genotypes, and increased number of clusters in small podded genotypes. There seemed to be some level of compensation between pod number and pod size. Hence some level of compromise between pod size and pod number is required in breeding programmes to develop improved vegetable genotypes that are acceptable to consumers. The results also indicate that increased number of clusters per plant is a good criterion to ensure high yields under the F1Y regime.

Keywords: cowpea, plant density and quality.