

ABSTRACT

Growth, development and yield of cowpeas (*Vigna unguiculata* (L.) Walp) in response to spacing, nitrogen and plant growth retardants

Amadou Tijan Jallow

A series of studies to determine the growth and yield response of some selected cultivars of cowpeas to a number of agronomic variables were undertaken. The effects of plant density were evaluated in four field experiments conducted during both the early (June-August) and late wet seasons (October-January). One field study was conducted to determine whether leaf area development, and consequently seed yield would be enhanced by fertilizer N application in late wet season planted cowpeas. Finally three pot studies and one field experiment were also carried out with the objective of evaluating the potential of some growth retardants, namely Alar, CCC and TIBA on yield and agronomic quality of cowpeas.

Plant spacing was found to exert the most significant effect on seed yields. The relative increase in yield at close spacing, however, tended to be greater in the late as compared to the early wet season. Highly significant cultivar X density interaction effects on seed yields were also observed. On the basis of detailed growth and morphological response to increases in density noted in the studies, several plant characteristics which might enhance yield response of cowpeas to increase in plant density were suggested.

Nitrogen application at thinning or at bloom led to only slight increases in leaf area, with corresponding increases in dry matter, but seed yields were not significantly affected. There were also no significant interactions between spacing and N application treatment on growth or seed

yield. Overall, the study demonstrated that varying plant population had a greater effect on leaf area development and on seed yield of late wet season planted cowpeas than fertilizer N.

Seed yields of cowpeas were influenced to a greater extent by Alar than the other growth retardants. In the pot studies, yield increases with Alar appeared to be due to a delay in maturity, and an increase in plant size and node number plant⁻¹ in the treated plants, rather than through a retardation of vegetative growth and redistribution of dry matter. In the field however, increases in plant size and node number plant⁻¹ did not lead to similar increases in yield, presumably on account of adverse environmental effects on pod set. Although the effects of CCC and TIBA on yield were marginal, it was suggested that the substantial inhibition of stem growth obtained with these chemicals might be useful in controlling excessive vegetative growth in cowpeas.

A number of recommendations for further research were also made.