



agriculture & rural development

Department:
agriculture
& rural development
PROVINCE OF KWAZULU-NATAL

MAIZE - COWPEA INTERCROPPING RESEARCH AT IMPENDHLE

Introduction

Maize is the major crop produced by small-scale farmers in KwaZulu-Natal, and mealie meal represents the staple food of many communities. Surveys conducted in various communities have revealed that yields of maize are frequently well below potential in the areas concerned, and the principal reasons for this are late planting dates and poor soil fertility. A particular challenge for extension and research staff, therefore, is to develop and ensure the implementation of suitable technology for increasing the maize yields of farmers. A further strategy for improving food security would be the inclusion of grain legumes, such as cowpea, either intercropped with maize or in rotation with it. Grain legumes are a valuable source of protein for humans. Furthermore, from an agronomic point of view, there are numerous advantages in the inclusion of legumes in cropping systems. These include reduced insect and disease problems, nitrogen fixation by the legumes, reduced risk of crop failure and possibility increased yield per unit area. In addition, recent research carried out in the Greytown and Geluksburg areas reveals that cowpea performs remarkably well in high acidic soils with very limited phosphorus supplies.

Research Methods

Cropping research was initiated in 1996 on the land of Mr Japhet Funeka in the Nxamalala Ward, Impendhle District. Soil testing indicated that the deep red soil (Hutton form) had severe infertility problems in the form of excessive acidity and phosphorus deficiency. These problems were addressed by incorporating lime and a 2:3:4(34) fertilizer in a band of soil in which the seed was planted.

Experimental treatments involved maize (PAN 6363) and cowpea (PAN 311) grown separately and as intercrops, and various planting dates for the crop combinations. The intercrop treatments included alternative single and double rows for cowpea and maize.



Maize-cowpea intercropping research trial

Results

Planting date had a major effect on the yields of maize and cowpea. In the case of maize grown on its own, yields decreased sharply as planting date was delayed (see Figure 1). Particularly noteworthy is the fact that the yield obtained from a 20 December planting was only 55% of that from a 5 November planting. The yields of cowpea, on the other hand, were higher with a later planting date (Figure 2). These different responses of maize and cowpea are thought to be due to the varying heat unit requirements of these crops. The relatively low yields of cowpea (the potential yield in the area is thought to be approximately 2.5 t/ha) were due largely to severe damage by CMR beetles which proved very difficult to control. In the intercrop treatments, maize yields were lower and cowpea yields similar to the respective yields of these crops in the monoculture treatments.

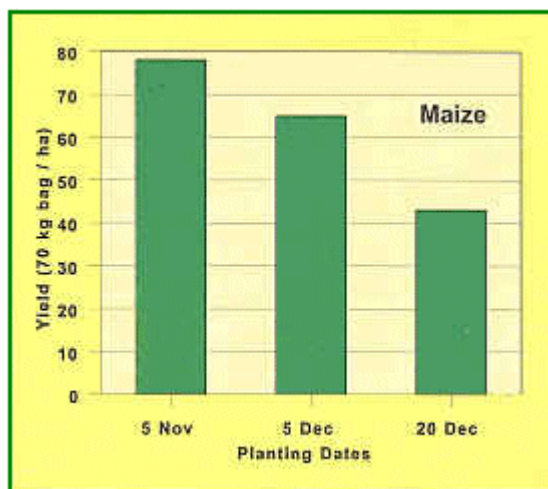


Figure 1. Effect of planting date on maize yields

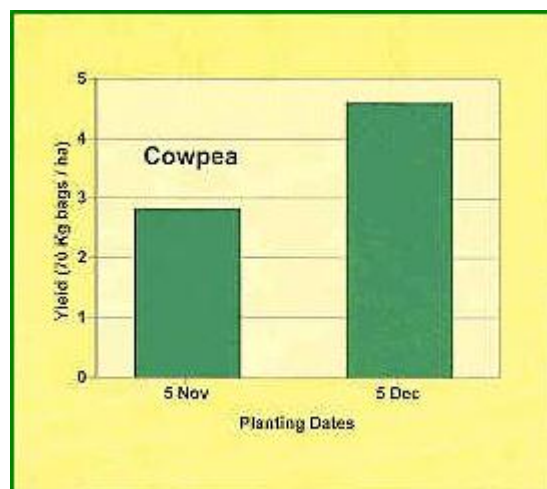


Figure 2. Effect of planting date on cowpea yields

Recommendations emanating from this research

- Acceptable yields are possible only where soil fertility problems are corrected by additions of lime and fertilizer. It is essential that fertility problems be reliably identified by soil testing.
- In Impendhle and related areas, maize should be planted before mid-November, while the optimum planting date for cowpea is in December or possibly even later than this. Short-season maize cultivars with high yield potentials should be planted.

Impact of the research

The success of this ongoing research programme is due largely to the hard work and enthusiasm of the farmer, Mr Funeka. Farmers in the surrounding community have shown keen interest in all aspects of the research, and at the end of the season a well-attended farmers day was held. This programme raises exciting possibilities for improving the stability of agricultural production in this area, and hence the food security of the community as a whole.