

## INTRODUCTION

In order to obtain high yields from any sown crop plant it is essential to ensure an even and vigorous stand of plants at emergence. Many agronomic techniques such as spacing, plant population studies and fertiliser placement depend directly on the successful establishment of the crop. The achievement of a satisfactory stand of plants is both fundamental and crucial to any commercial farming system. The period of time between seed sowing and the commencement of photosynthesis by the seedling is one in which the plant is highly susceptible to a number of environmental factors. Hagan (1952) lists these factors as temperature, moisture, oxygen supply, light, carbon dioxide concentration, soil pH, mineral element supply and activities of micro-organisms. Hanks & Thorp (1956) add the factor of mechanical impedance of the soil medium.

This thesis is concerned with sowing depth and the moisture status of a soil as they affect seedling emergence.

In the Tropics it would appear that mechanical impedance and moisture supply could be of particular importance in emergence studies, due to the fluctuations in moisture content of the soil attendant upon the high evaporative losses and seasonal fluctuations of climate. The wetting and drying cycles of tropical soils occur at a faster and more extreme rate than in temperate soils, often leading to capping, which could have important effects on the availability of moisture for germination and emergence. In the past the depth of sowing of many crops has followed convenient or rule of thumb methods, but there seems to be a possibility that adverse effects of the environment could be reduced by choosing an appropriate sowing depth. This could be especially important with respect to a change in sowing date, which in turn could effect the economic return from a particular crop.