

EFFECT OF SEEDLING TRANSPLANTING ON PARTITIONING OF DRY MATTER BASED ON RADIATION UTILISATION ANALYSIS IN SUGAR BEET

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Two field experiments were conducted to determine the effect of transplanting, plant arrangement, plant population and sowing date on partitioning of dry matter based on radiation utilisation analysis at Lincoln, Canterbury, New Zealand. Both the transplanting and arrangement or population. In contrast, the partitioning of root dry matter to sugar was similar in all the treatments in both the seasons.

The fraction of total dry matter harvested as sugar varied more in transplanting especially at the 4-leaf stage than the seed-sown beet. Calculation of an average recoverable sugar yield made using the average values of total photosynthetically active radiation (PAR) absorbed during growth and utilisation efficiency of total dry matter to PAR absorbed for the crops measured and an average harvest index of 0.56, achieved in the experimental crop showed a sugar yield of 11.56t ha⁻¹ to be possible. To achieve such a yield would require full crop cover from the beginning of October (Southern Hemisphere) until the end of March in a typical Canterbury growing season.

INTRODUCTION

Sugar yield at harvest can be conveniently described as fraction of the total dry matter (TDM) produced by the crop. This is often referred as the harvest index (HI) and is an important variable when considering sugar beet yield (Snyder and Carlson, 1978). Field experiments indicate that DM distribution, at final harvest, may be influenced by the agronomic treatments such as nitrogen (Draycott and Webb, 1971) or sowing date (Hussain and Field, 1991). In such studies, however, it is not possible to determine how and when the differences in HI occurred, due to lack of information

Despite the obvious importance of HI to yield, no study has reported the influence of transplanting seedlings and other agronomic treatments on partition ratios such as ER/ET, ES/ET, ES/ER, throughout the season in terms of radiation utilisation. This paper, therefore, examines the effect of transplanting to agronomic practices such as planting arrangement, plant population and sowing date on the partitioning of DM in sugar beet, based on radiation utilisation analysis.

MATERIALS AND METHODS

The experiments were conducted from 1981 to