

B-04 Relative importance between the source and sink in dry matter production during grain filling stage of maize

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Dry matter production in maize during grain filling stage is controlled by 2 factors: (a) the potential ability of leaves to produce photosynthates (source), (b) the potential capacity of grain to accumulate photosynthates (sink). A field experiment was conducted at the Faculty of Agriculture, Kilinochchi to study the relative importance between the source and sink in dry matter production of maize. Maize variety Bhadra was cultivated under irrigation in 60 x 30 cm space by using all agronomic practices recommended by the Dept. of Agriculture. To study the source sink relationship 60 uniform plants were selected from the population and 10 were subjected to each treatment. The 6

treatments were: (1) All leaves above the cob removed at silking stage; (2) All leaves below the cob removed at silking stage; (3) 50% of the above cob leaves just above the cob removed at silking stage; (4) 50% of the above cob leaves from the top removed at silking stage; (5) All leaves removed at silking stage; (6) All cobs removed at silking stage.

To study the effective sink in prolific types of maize, plants that produced 2 cobs were selected and divided into 2 groups of 10 for 2 treatments. In one treatment leaves were not removed while in the second treatment all the leaves above cob were removed. Removing all leaves resulted in no grain production and in a decrease of the culm weight. This is due to the non-availability of photosynthates to translocate to grain in the absence of source (leaves). Removal of cob (sink) immediately after silking, reduced the dry matter production by 37%. This indicates that the presence of sink creates demand for photoassimilates.

Removing leaves above the cob caused a decrease in grain yield by 28% while, removal of leaves below the cob caused a reduction in grain yield by 7.5%. Among the leaves found above the cob, the leaves closer to the cob translocated more assimilates to grain than the leaves found in the top. This reveals that the source closer to the sink translocates more assimilates to the sink than the distant source. Further, it was found that removing leaves (source) however, increased the efficiency of dry matter production of the remaining leaves.

Plants with 2 cobs produced 29% higher grain yield than the single cob type. Approximately 65% of the total grain yield was produced by the upper cob.