

ABSTRACT

Irrigation during a severe dry season such as that experienced during the earlier part of 1973 does have a significant effect on the dry matter yields of Pangola grass. If, however, the dry season is constantly interrupted by frequent showers the effect of irrigation is negligible especially if the supply of nitrogen is adequate. The results of irrigation during the dry season of 1972 show this effect quite clearly. Increasing applications of nitrogen up to 600 lb N/A/y during a dry season that is frequently interrupted by rain results in increased dry matter yields. In a more severe dry season there is a tendency for the yields on the unirrigated plots to remain constant as nitrogen increases, with a slight depression at the 400 lbs Nitrogen treatment. A similar trend was observed at the 0.5" deficit but at the 1.5" deficit this trend tends to be reversed. At the 1.0" deficit there is a continuous decline in yields as the level of nitrogen increases. In the wet season, the dry matter yields on the highly fertilised plots at all levels of irrigation are depressed while on the lowest nitrogen treated plots the yields tend to increase above that of the dry season.

There were no seasonal differences in the crude protein yields for the various nitrogen and irrigation treatments. High nitrogen application however, did result in significantly higher crude protein percentage of Pangola in both wet and dry seasons.

Irrigation need of Pangola was predicted by use of a regression relationship between net open pan evaporation and soil moisture depletion. This regression relationship is $y = 0.30 - 0.13x + 0.29x^2$, where y represents soil moisture depletion and x net evaporation. Starting from a

measured soil moisture value the changes in soil moisture were calculated using the estimated depletions. This method gave significantly high correlation values for measured and calculated soil moisture deficits for the control and the three (3) irrigation treatments. Because of the constant relationship between Penman's evaporation and net open pan evaporation, Penman's evaporation has been used to predict soil moisture with a high degree of accuracy especially at the higher soil moisture deficits.

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