

THE USE OF THE WATER BALANCE APPROACH IN THE ASSESSMENT OF
THE GROWING SEASONS FOR MAIZE AND SORGHUM IN SOUTH NYANZA DISTRICT.

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ABSTRACT

This study ~~makes an attempt~~^s to use the water balance approach in establishing the suitable variety(ies) of maize and sorghum for South Nyanza District. The suitable variety(ies) of maize and sorghum are selected in terms of their length of growing from planting to maturity and in terms of soil moisture availability in the agro-climatic zones of South Nyanza.

Water balance was calculated for selected twenty nine stations in South Nyanza and parts of Kisii District. This gave a clear picture of soil moisture storage distribution, moisture deficit distribution, and soil moisture surplus. This showed variations in length of growing seasons as defined from one agro-climatic zone to the other; variations in length of growing seasons from one water year to another; and lastly the variations in length of growing seasons within a given agro-climatic zone. These variations were shown to be due to the amount and distribution of rainfall and also due to soil moisture carrying capacity. On the basis of these variations, suitable varieties of maize and/or sorghum were chosen for the agro-climatic zones and best time of sowing established.

Water balance for selected varieties of maize and/or sorghum were carried out to estimate the crop water use. These helped in determining the extent to which the water requirements of selected crops within a region in South Nyanza were met. To

work out the crop water requirement, data on crop coefficient(Kc) and Penman ETC were estimated. These data and data on time of planting and, reliable rainfall, helped in estimating crop performance as to the soil moisture availability and distribution.

The water balance for selected varieties of maize and sorghum resulted in various crop areas of South Nyanza District as follows: marginal Serena and Katumani Composite B zone; the Serena and Katumani Composite B zone; Sereto or 511 zone; the H511 and Katumani - two crops in a year zone; and lastly the maize zone. In general the lake lowlands of South Nyanza District should start planting the recommended varieties of maize and/or sorghum in second half of March and even early April, and the plateau areas of South Nyanza to start planting (sowing) the recommended varieties in the second half of February or early March. The generalisation above about the crop areas or zones of the District was discovered to be unwise and so, each area as represented by twenty eight stations, was treated in the study independently and then the similarities and unique features noted. This portrayed a good picture of the variations in the length of growing seasons in South Nyanza hence the need for different varieties of maize and/or sorghum as one moves from one "geographical unit" to another.