

IDENTIFICATION OF CROP-GROWING SEASONS OF SEMI-ARID KENYA BY
ANALYSES OF THE SOIL MOISTURE PATTERNS

A Thesis

by

DAVID KASINA MUSEMBI

UNIVERSITY OF NAIROBI
KABETE LIBRARY

UNIVERSITY OF NAIROBI
KABETE LIBRARY

UNIVERSITY OF NAIROBI
LIBRARY

Submitted to the Graduate College of
Texas A&M University
in partial fulfillment of the requirement for the degree of
MASTER OF SCIENCE

May 1984

M
U
S
E
M
B
I

Major Subject: Meteorology

ABSTRACT

Identification of Crop-Growing Seasons of Semi-Arid Kenya by
Analyses of the Soil Moisture Patterns. (May 1984)

David Kasina Musembi, B.S., University of Nairobi

Chairman of Advisory Committee: Prof. John F. Griffiths

Eight stations with over 30 years of rainfall record were selected in the dry region of Kenya, east of 37°E longitude, to study the nature of the crop growing seasons during the short and the long rains (October through June).

The rainfall data were reduced to soil moisture based upon area-wide assumptions on the soil characteristics. The start, end and duration of the crop growing seasons were determined and tested for normality using a 10 mm soil moisture threshold value at each station. Mean seasonal conditions were computed and comparisons were made between the two growing seasons within each station and among all the stations. Stations were grouped according to the magnitude of the coefficient of determination between start and duration and regression equations were developed to predict season duration, from the starting dates. Equations are also derived to estimate the probable length of the growing season for various levels of crop moisture requirements. The exceptionally wet and dry years are examined.

The distributions of the start, end and duration of the seasons are not significantly skewed or significantly different from the normal distribution. The start and end times of the short rains

season have a southward trend. The start of the long rains season is widespread but the end of the season shows a northward trend. Durations in both seasons have no general patterns but reflect the influence of local factors. The short rains growing season is found to last longer and to have a higher soil moisture content than the long rains season for the stations located south of the equator. The opposite is true for the stations north of the equator.

The very wet and very dry seasons are not usually widespread. The occurrence of a very wet season appears to weaken the other season and a 10-year periodicity is observed in the very wet and widespread seasons in the short rains season. Periodicity is not observed in the long rains season or for the very dry seasons.