

Rainy season characteristics of the Free State Province of South Africa with reference to rain-fed maize production

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Abstract

The study assesses onset of rains, cessation of rains, duration of rainy season and seasonal rainfall at different probability levels. Daily rainfall data for 309 stations located in the Free State Province of South Africa were analysed from 1950 to 2008. The cumulative rainfall over 3 consecutive dekads (10-day periods) and cumulative rainfall over 1 dekad were used to determine onset of rains and cessation of rains respectively. Seasonal rainfall was determined as the accumulated rainfall from November to March. Rainbow statistical software was utilised to test for normality and determine probabilities at 20%, 50% and 80% risk levels. The other rainy season characteristics investigated were the probability of onset failure and probability of rainy season duration of less than 50, 100, 120 and 140 days. These rainy season indices were investigated in relation to maize production in the Free State. Rainfall behaviour during the growing period is one of the main limiting factors to rain-fed maize production, consequently influencing household food security. The results show that for onset of rains there is a large spatial variance over the Free State while cessation of rains shows small variance. There is also an east to west progression of onsets while the duration of the rainy season and seasonal rainfall also increased from west to east. Areas of low risk associated with rainy season characteristics are evident over the Thabo Mofutsanyane, eastern Motheo, eastern and northeastern Lejweleputswa and the Fezile Dabi districts, making these areas highly suitable for maize production. By contrast, high-risk areas are in the western and southern parts of the province and thus dryland maize production has low production potential in these areas.

Keywords: onset of rains, cessation of rains, seasonal rainfall