

4.6. Climatic growing period

Growing period, as a climatic concept, is the time of year when neither moisture nor temperature limit crop production. Developed about 30 years ago (e.g. Cochemé and Franquin, 1967), it was subsequently adapted and applied by the Food and Agriculture Organization of the United Nations (FAO, 1978-81) to assess potential plant productivity and land suitability at the global, continental, and regional scale.

The components of the climatic growing period (onset, duration, and end) are determined by a waterbalance approach, which matches monthly rainfall to monthly potential evapotranspiration. In technical terms the growing period is the 'period of the year during which the actual evapotranspiration exceeds a critical threshold' (De Pauw, 1983). This threshold is usually 50% of the potential evapotranspiration.

4.6.1. Types of growing period

Three types of growing period are described for the Arabian Peninsula. Their distribution is shown in figure 25.

The vast majority of the region is characterized by an *all-year-round dry period*. There is no growing period because the critical ratios of actual to potential evapotranspiration are not exceeded. In this moisture regime the quality of the growing period is no longer determined by the rainfall but by the level of potential evapotranspiration; the higher the latter, the higher the irrigation requirements. An example of an all-year-round dry period is shown in figure 26a.

In the Yemen highlands, northern Kuwait, and parts of the mountains of northern Oman, a second type of growing period occurs. The *intermediate growing period* lacks a humid sub-period: when rainfall exceeds potential evapotranspiration soil moisture is not recharged. Crop production in such areas is very risky and usually requires an additional source of water to stabilize yields. However, this type of growing period has a reasonable productivity for natural vegetation. An example, with two sub-periods, is shown in figure 26b.

In a very few areas of the Peninsula, located in the most rainy parts of the Yemen highlands, the *normal growing period* occurs. It is characterized by a *humid sub-period*, when soil moisture is recharged. This soil moisture can later be released to crops when rainfall drops below the potential evapotranspiration, thus buffering crops against drought stress. This type of growing period is of the

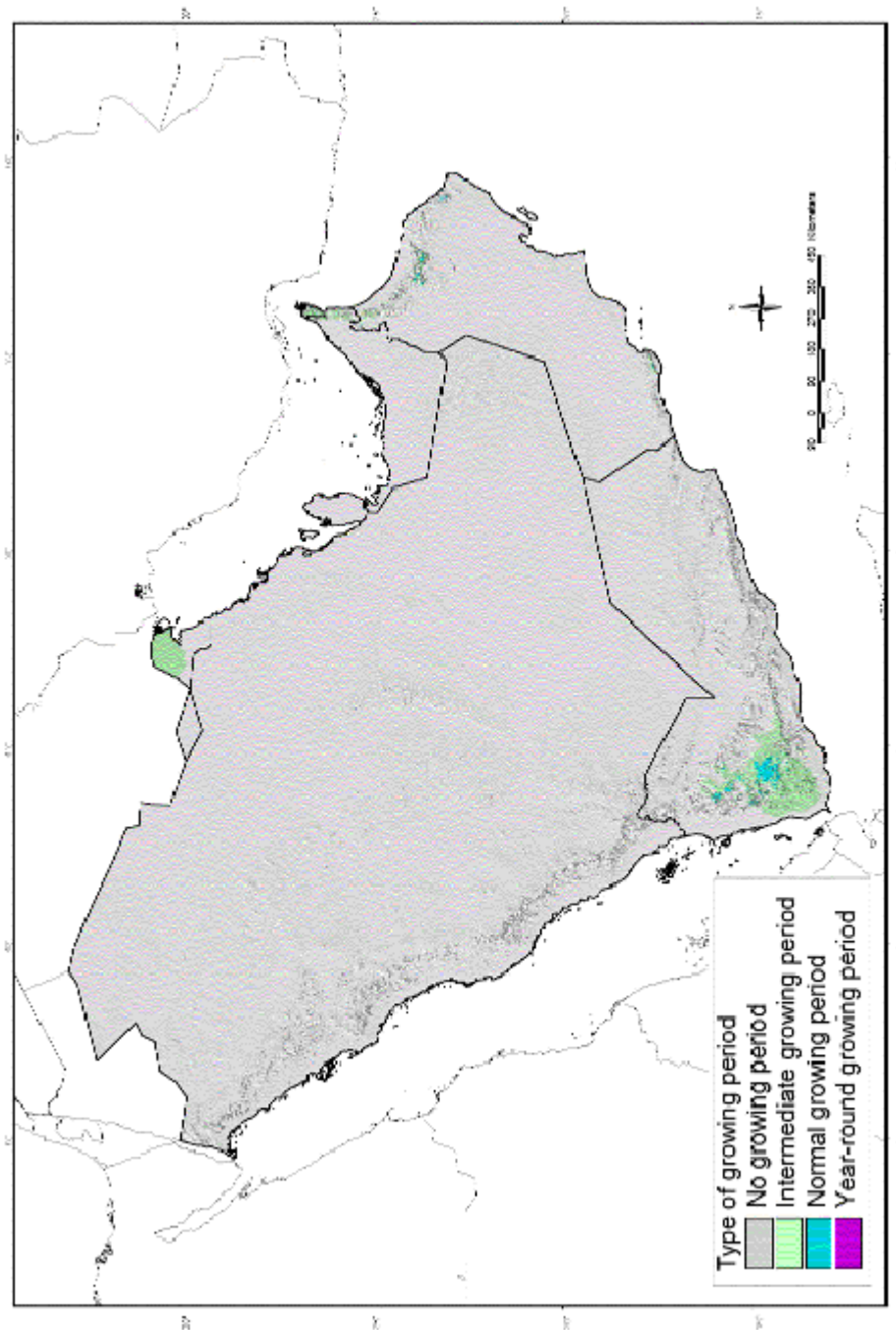


Fig. 25: Types of growing period

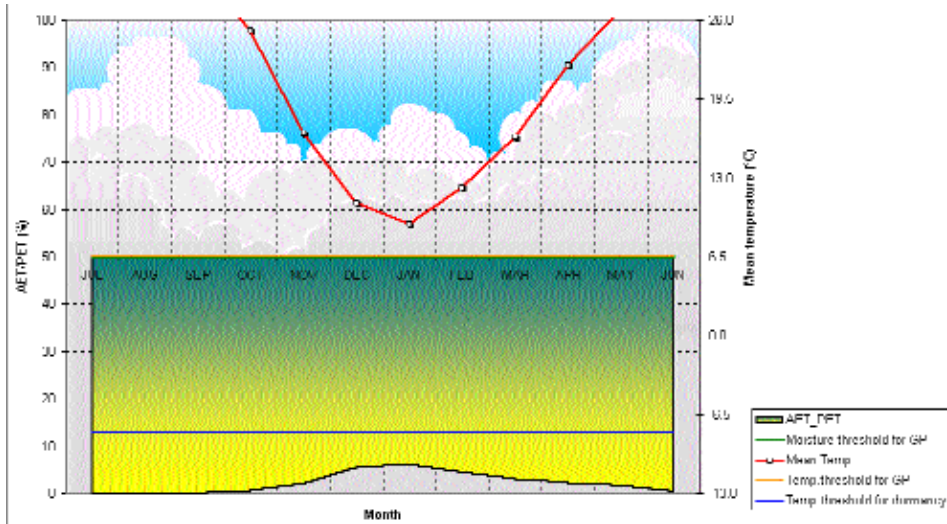


Fig. 26a: Example of a year-round dry period (Al Jouf, Saudi Arabia)

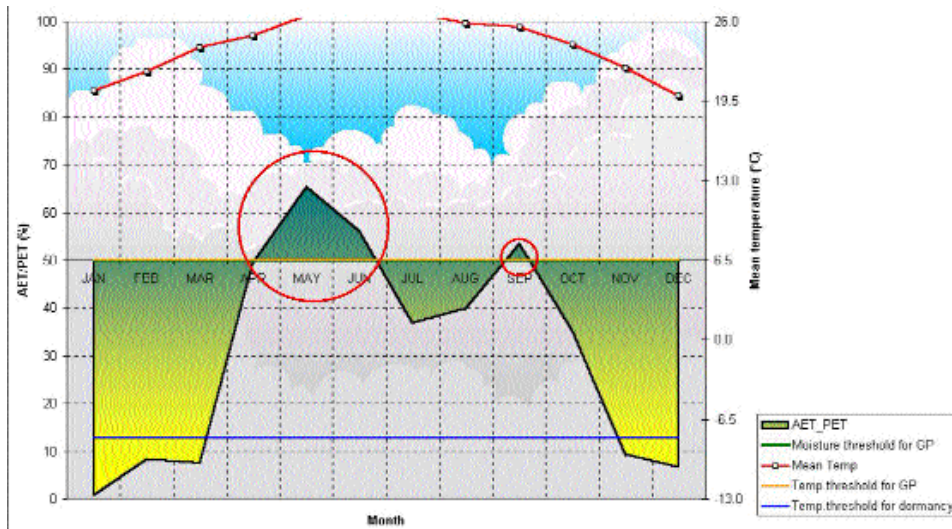


Fig. 26b: Example of an intermediate growing period (Taiz, Yemen)

highest quality, ensuring optimal biomass productivity, and, if of sufficient length, good crop yields. No representative station is available for the Arabian Peninsula; therefore, the concept is illustrated with an example from Aleppo, Syria (Figure 26c).

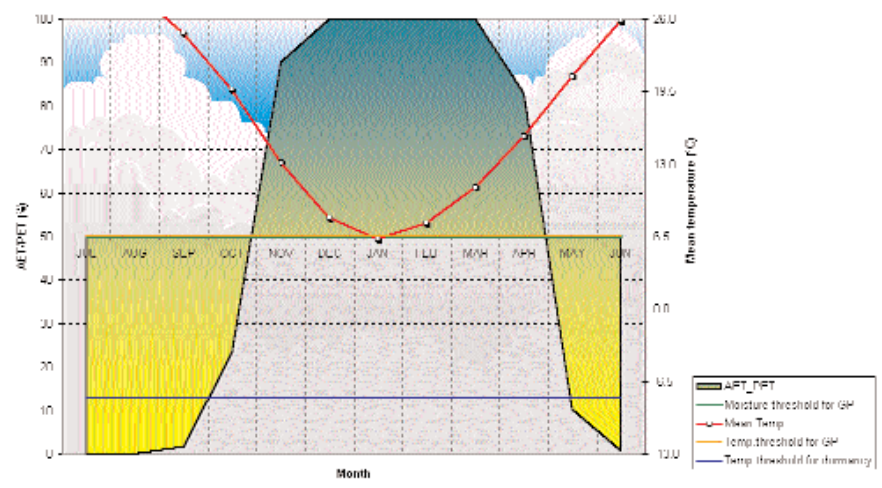


Fig. 26c: Example of a normal growing period (Aleppo, Syria)

4.6.2. Duration and onset of the growing period

In most of the Arabian Peninsula, length and timing of the growing period are highly variable as a result of pronounced rainfall variability (see section 4.2.3.). The only areas where the growing period is sufficiently reliable to appear in average data are the highlands of Yemen. This part of the Peninsula has two rainy seasons, one in March-May, the other in July-September. The durations of the resulting two growing periods are shown in figures 27a and 27b. The onset date of the main growing period is shown in Figure 27c.

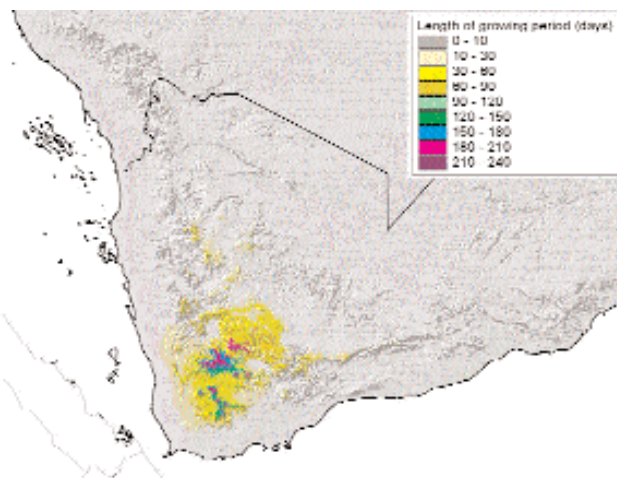


Fig. 27a: Length of the first growing period, Yemen Highlands

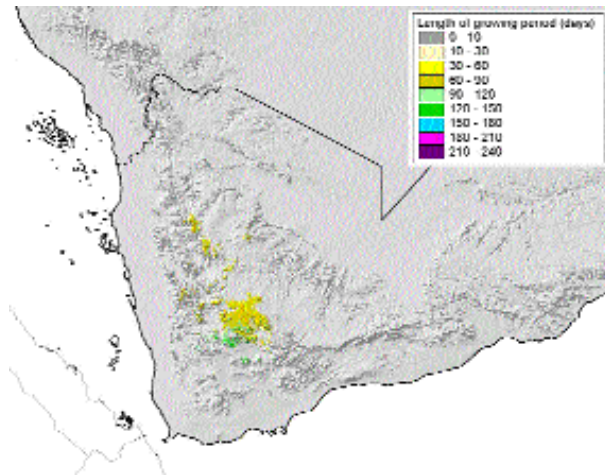


Fig. 27b: Length of the second growing period, Yemen Highlands

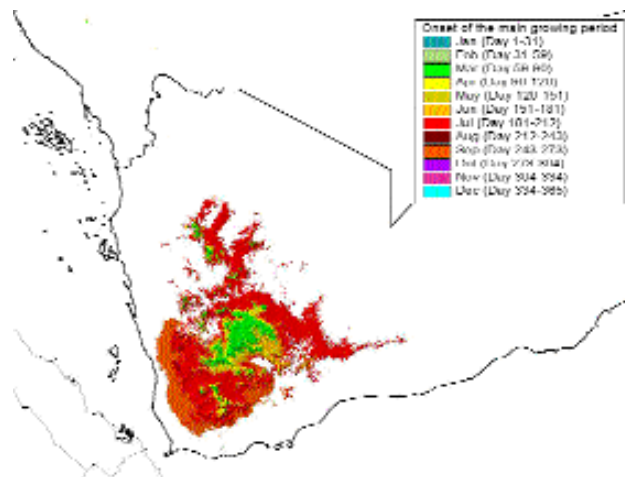


Fig. 27c: Onset of the main growing period, Yemen Highlands