

The onset of the rainy season in the Sahel: Variability at hydrological and agronomical scales

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The onset of the rainy season in the Sahel is studied on a densely instrumented area, allowing for an analysis of the spatial variability as well as the interannual variability. The area is located in the region of Niamey (Niger) and covers about 16 000 Km².

Three criteria are used to define the onset, one is spatial (“climatological”), and the two others are local (“hydrological” and “agronomical”). The climatological date is linked to the observation of the first organised mesoscale convective system. The hydrological criterion takes into account the first rainfall generating run off, even if it is a local event. The agronomical criterion requires that no dry spell of more than 7 days follows the onset.

The onset dates obtained from the three criteria for 12 consecutive years are compared. In average, the “hydrological” onset occurs six weeks before the “agronomical” onset. The occurrence of the first organised convective system is in between.

However, these average results hide a great spatial variability over our study area. For a given year, about one month may separate the earliest onset at a given station of the latest, for both local criteria. Similarly, there is an important interannual variability of the onset, whereas the end of the rainy season is much less variable.

A correlation analysis between the date of the onset, the length of the season and the total seasonal rainfall shows that the total rainfall is poorly correlated to either the date of the onset or the length of the season. Consequently, seasonal forecast techniques, based solely on the date of the onset, have little predictability potential.

The agronomical onset occurs in average at a date close to the date of the monsoon jump (third week of June). This is consistent with the fact that meteorological conditions at the monsoon onset lead to shorter dry spells.

The implication of these results for millet crops are discussed as a conclusion.

Agriculture (Poster)