Metrics to estimate the probability of rainfall that poses a risk to the corn harvest (*Zea mays*)

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Abstract

The objective of this work was to demonstrate the usefulness of metrics built from daily precipitation data in determining rainfall probability at harvest as a risk factor for corn crop. For this, we used rainfall historical series with the longest available base period, from rainfall stations located in each of the five Brazilian regions. We transformed the average accumulated rainfall and the number of days without rain into metrics and generated three rain risk classes at harvest (low, medium and high). The probability of occurrence of these classes, expressed as a percentage for a period of ten days (decade of the month), calculated from each metric, allowed the visualization of differences between metrics and regions. The metrics, despite being different from each other, were similar to the behavior of monthly rainfall averages in the studied places. The modification of thresholds used in each metric for division into classes changes the profile of the distribution of classes throughout the year and may be used to adjust the method based on field data in future validation analysis. We can use the establishment of cutoff points based on the relative frequency of each class to guide the producer to avoid planting that result in the harvest in certain period of ten days of the year when the risk of rain is greater. Agrometeorological metrics can be useful in various agro-environmental studies.

Keywords: thresholds, relative frequency, agrometeorology, agricultural insurance, crop planning.

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