

Research developed by UFRGS agrometeorology group in the context of monitoring and crop forecasting, using satellite images

Fontana, D.C.; R.W. Melo; A.H. Junges; E.V. Klering; A.P. Cordeiro; M.A. Berlato and H. Bergamaschi

Revista Argentina de Agrometeorología RADA, v. VII (2016): 27-40

Summary

This work aims to report some studies developed at the Federal University of Rio Grande do Sul (UFRGS), in the areas of crops monitoring and harvest forecasting, specifically with regard to research undertaken by the Agrometeorology Group - GA and the Research Laboratory Agriculture and Agrometeorology - LEAA, located in Porto Alegre, Brazil. This group accumulates a solid history, built from a constant and progressive sequence of researches. The text addresses the major advances made by the GA and LEAA on the main segments of a crops monitoring system, namely: estimation of cropping area and of grain yield, and monitoring tools for estimating the soil vegetation cover. The most commonly used method for quantifying cropping areas combines the use of moderate and high spatial resolution sensors, using widely the spectrum temporal attribute. Annual crops have variations in spectral response throughout the cycle, which distinguishes them from other targets, permits the use of the temporal variability of vegetation index for constructing of crop masks. Estimations of crop yields have been made by an agrometeorological-spectral model, which adds parameters of vegetative biomass, obtained through remote sensing, to a weather database. This kind of model assumes that the agrometeorological term expresses the influence of solar radiation, air temperature and humidity, and water availability on the grain production, while the spectral component expresses also alterations in practices of crop management, cultivars, and other stresses not included in the agrometeorological model. A database of vegetation indexes is mostly used for monitoring the vegetation

cover, considering that they are consistent indicators of vegetation response to environmental effects, such as climate, anthropogenic actions, or changes in use and land cover. The GA and LEAA groups have close relationship among researchers, including an interchange of students between the Post-graduation Program in Plant Science (PPGFito/UFRGS) and Post-graduation Program in Remote Sensing (PPGSR/UFRGS). Special attention is given to the training of qualified human resources and to the interaction with other research groups, at national and international level. Advances from the technical point of view, listed in the text, are focused on developing and testing of tools and instruments that can be incorporated to the production system, in order to qualify the existing monitoring programs of the Brazilian agriculture.

Key words: agrometeorological-spectral models; crop mask; MODIS