Belgian and Chinese Crop Growth Monitoring Systems : comparison, adaptation and improvement BL/19/C19

(Geographic) study area : Province of Heilongjiang - China

OSTC testsite (if applicable) **:**

Satellite imagery used (type and co-ordinates of images purchased by OSTC)**:** SPOT-VEGETATION, NOAA-AVHRR and LANDSAT ETM

Other data : Meteo and Agricultural data

Context and objectives

Belgian and the Chinese Heilongjiang province have developed their own yield forecasting system for both food security or economical tools for decision maker. The project proposed an in depth analysis of both approaches aiming a mutual enrichment.
More precisely, the project objectives were:

- To compare the Chinese and the Belgian Crop Growth Monitoring Systems.
- To define the most interesting and innovative elements of both crop monitoring systems, and to study the ways these approaches can be mutually exchanged. This would allow, among other, to study the potentialities of the Belgian system in a completely other context and to precise its limits of work.
- To introduce the remote sensing approach in the Chinese system and to improve the remote sensing interface for the Belgian system.
- To adapt and improve both systems and develop two prototypes enriched by the two-year collaboration and taking into account the particularities of each country.

Methodology

- Learning Belgian and Chinese Crop Growth Monitoring Systems
- Transfer of both methodologies to the other country
- Testing, adapting and improving the two Systems in the new contexts . Development of two prototypes
- Use of Low Resolution Imagery for the Assessment of the Crop Yields
- Use of High Resolution Imagery for the Assessment of the Crop Acreages
- Delineation of areas suffering climatic stress (droughts, frost, inundation)

Results

In Belgium, the final yield forecasting is now based on a wide range of “indicators” provided by the different sub-models. For instance, it was found that simple meteorological parameters, such as the sums of temperature or evapo-transpiration, integrated over critical phenological stages, often give better results than the outputs of complex simulation models. The statistical forecasting module was extended with more flexible calibration models and with a quite promising tool for “scenario analysis”. The remote sensing software was also streamlined and integrated within the system. Currently the B-CGMS is fully operational and able to create timely outputs on a routine base. Since April 2002, a monthly Agrometeorological Bulletin is distributed by electronic mail over a wide audience of interested persons and organisations in Belgium.
In Heilongjiang, the European Crop Growth Monitoring System was set up for yield estimation and forecasting of their main crops. Crop acreage is established from a multitemporal, high resolution (Landsat-ETM) imagery classification for the two selected test sites in Heilongjiang : one in Sanjiang Plain, the other in Songnen Plain. Both are situated in agriculturally important areas. Finally, drought indicators, either based on meteo or remote sensing data, were calculated for Heilongjiang. Drought not only can severely reduce the crop productions but it also triggers forest fires which yearly devastate large areas of woodland.

Products and services

- An updated crop growth monitoring system for Belgium
- A new crop growth monitoring system for Heilongjang associated with a crop acreage mapping methodology

Execution

Period: 12/2000 to 12/2002

Laboratory: Fondation Universitaire Luxembourgeoise, Walloon Agricultural Research Center, Flemish Institute for Technology Research, Heilongjiang Province Institute for Meteorological Sciences

Discipline (select one or more appropriate disciplines)

Weather and climate
Agriculture Environment
Natural hazards & disasters