

## **Calibration and Verification of WOFOST simulation crop model Results after STSM of Dr. V. Kazandjiev and V. Georgieva-Milanova, NIMH-BAS, Sofia Bulgaria**

Aim of the visit is to increase and elaborate knowledge applying the WOFOST model, part of the Crop Growth Monitoring System (CGMS) in Europe. In the process of training the applicants is expected to tune, calibrate and verify the WOFOST\_model parameters connected with limiting factors such as water and nutrients, soil type, rain conditions, crop parameters etc.

In the last fifteen years more and more extreme values of temperatures and rainfalls as well as related hydro-thermal conditions have been observed. Droughts and floods in large regions of Europe are important and limitation factors for growth, development and yield formation of main crops. From this point of view different unfavorable weather conditions will be simulated and then the obtained results will be analyzed. An attempt for establishment of relationships between some climatic and hydro-thermal indices and the phenological development of winter wheat, barley, maize, sunflower and soybean will be done. The influence of sowing dates to the harvest results will be also investigated. Climate variability and climate change are important conditions for building of a new strategy for agriculture. In connection with this peculiarity climatic scenarios will be applied to various simulations analyzing their effects.

Subject of the investigation was next parameters of the WOFOST model

EFFTB Initial light-use efficiency of CO<sub>2</sub> assimilation of single leaves as function of daily temperature ((kg•ha<sup>-1</sup>•hr<sup>-1</sup>)/(J•m<sup>-2</sup>•s<sup>-1</sup>); °C).

TBASEM Lower threshold temperature for emergence (°C).

TEFFMX Maximum effective temperature for emergence (°C).

TDWI Initial total crop dry weight (kg•ha<sup>-1</sup>).

TSUMEM Thermal time from sowing to emergence (°C•d<sup>-1</sup>).

TSUM1 Thermal time from emergence to anthesis (°C•d<sup>-1</sup>).

TSUM2 Thermal time from anthesis to maturity (°C•d<sup>-1</sup>).

### **Main results**

- Established a common research methodology and selected models and empirical relations for estimation of growth and drought impact on productivity of different agricultural crops in agriculture - both in Austria and Bulgaria; \_
- Get knowledge on available publications and related to agrometeorological forecasts and applications of simulation models and indices;
- Evaluated and adopted of research methods and approaches recommendations for structure of agricultural production and use agroclimatic and biological resources zoning preparing.

### **Future collaboration**

Two partners achieve to understanding to continue joint research in the frame of bilateral scientific project with working title **“Agroclimatic Resources for Field Cultures Cultivation under Natural Conditions in Austria and Bulgaria”**.

### **Projected publications/articles**

It is expected results from STSM to be published in few scientific papers/  
publications