# Calibration of SIRIUS Model for Different NS-sorts of Small Grains

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A crop model is a computer programme that attempts to simulate plant-soil-weather interactions. These models are prepared for estimating times of key phenological events, crop water use, use of nitrogen and influence of water and nitrogen deficit on crop growth and development as well as crop yield, much before actual harvest of the crops. The greatest use of crop models so far has been by the research community, since models are primarily tools for organising knowledge gained in experiments. The use of models in decision-support systems has had major impacts in the areas of irrigation scheduling and pest management. Moreover, increasing demand for more accurate estimation of climate change impact on agricultural production forced modellers to use them to assess the effect of climate change on grain yield and variability.

Frequently used wheat simulation model that calculates biomass from intercepted photosynthetically active radiation (PAR) and grain growth from simple partitioning rules is SIRIUS model. In this model, phenological development is calculated from the mainstem leaf appearance rate and final leaf number. Effects of water and N deficits are calculated through their influences on LAI development and radiation-use efficiency.

Although wheat models represent power tool of modern agriculture they were not commonly used in Serbian agricultural research institutes and advisory services. This work is a first step in our attempts to introduce crop modelling tools in our agricultural research and practice. Using SIRIUS wheat model, phenology dynamic and grain yield were calculated for different NS-sorts of small grains. Among others, SIRIUS model was selected because it is a well defined and structured, user-friendly model tested in different agroecological regions. Moreover, this model is based on strong physiological and biophysical background taking into account most important processes describing soil-vegetation-atmosphere interaction. At this level of application it is most important to calibrate model using observed dates of phenological phases appearance and measured grain yield. Hence, calibrated model could be used with numerical weather prediction model on the input side to provide better estimation of phenology dynamic and farm operations management timing.