

## **Assessment of modelling solutions in agricultural systems in Ukraine**

Oleksii Kryvobok, Oleksandr Krivoshein

Ukrainian Hydrometeorological Institute

Kyiv, Ukraine

The assessment of modeling solutions (BIOMA) in agricultural systems based on the data collected on experimental site, located in Kyiv region, north part of Ukraine. These data include different kind of information: soil data, meteorological data (2000 – 2010), phenology data (2000 – 2010), agro-management data, including fertilizer and tillage (2000 – 2010), biomass data (weight of grains on m<sup>2</sup> or 100m<sup>2</sup> for winter wheat and maize, respectively) and statistical information (crop yield for 2000-2010). Evaluation model and experimental data equally representing standard and extreme weather. We estimated extreme weather using the following criteria: ARID=1 – T/ET<sub>0</sub> (0 no water deficit, 1 most extreme aridity), where T- transpiration, ET<sub>0</sub> – reference evapotranspiration; Heat Shocks, when max temperature > 30°C and Cold Shocks, when min temperature < -6°C. Weather anomalies used for targeted simulations, assessing the capability of new models (WOFOST basic and WOFOST extreme) to capture the anomalous response of plants. In order to estimate the capability of the models to the anomalous response of plants in different vegetation stages we estimated weather anomalies from emergence to stop vegetation in autumn, from spring recovering vegetation to flowering and from flowering to maturity for winter wheat crop and from emergence to flowering, from flowering to maturity for maize crops. As a result of our evaluation, we conclude that the basic solution of WOFOST provides realistic values of potential and water limited biomass for Ukraine (winter wheat and grain maize). The extreme weather solution of WOFOST needs in improvement for winter wheat crops. Extreme weather solution of WOFOST for grain maize looks very realistic after calibration based on collected biomass.