Explanatory notes

This advanced options tab aims to allow WaPOR users calculating Crop Water Productivity by applying crop-specific parameters to the biomass output so to obtain yield and thus crop water productivity. It is in experimental phase and we would very much welcome your feedback at wapor@fao.org. When clicking on Run Operation, the combination of these parameters will be applied to the total biomass developed over the growing season (as specified in the "time period" tab) and the downloadable files will be: Yield, Actual Evapotranspiration and Interception (for the same period), and the resulting Crop Water Productivity.

The list of crops is currently limited to main cereals and a few other crops for which parameters are available in literature (*FAO Aquacrop Users Guide* and *FAO Irrigation and Drainage Paper 66*). Users can edit the parameters if more context specific information is available (such as crop variety).

1. **Light Use Efficiency** (LUE) is a coefficient for the efficiency by which vegetation converts energy into biomass. A fixed value of 2.7 is applied to cropland in WaPOR and, through this interface, the value is multiplied by 1.8 for C4 crops, which have higher LUE.
2. **The Harvest Index** (HI) indicates how much of the biomass production contributes to the harvestable fraction of a crop (yield). It is expressed as the ratio of weight of dry grains over the above-ground dry matter.
3. **Above ground over Total biomass** (AoT) ratio is influenced by several factors, including root development.
4. The **Moisture content ratio** (θ) allows for converting fresh yield into dry yield by accounting for water content in harvested product.

The yield will be calculated as follows

$$Yield = TBP * LUE * HI * AoT/(1 - \theta)$$

And Crop Water Productivity as

$$CWP = \frac{Yield}{ETIactual}$$

Where Yield is expressed in kg/ha and actual ETI is expressed in m³/ha.

The raster files for download are named as in the following example

L2_AETI_1931_2009.tif = Total actual evapotranspiration and interception generated between dekad 31 in 2019 and dekad 09 in 2020 (1st of December 2019 – 31 March 2020) in m³/ha;

L2_TBP_1931_2009.tif = Yield generated in the same growing season, in kg/ha;

L2_GBWP_1931_2009.tif = Crop Water Productivity, with a scaling factor of 1000.