

Changes from earlier versions of MACRO 5

New features in MACRO version 5.2

- FOOTPRINT pedotransfer functions
- Adapted to enable higher-tier simulations for pesticide risk assessments in the EU

The following changes have been made to the model since version 5.0. *These changes are not described in the technical report.*

1) The bottom boundary condition ‘Groundwater table in the soil profile’ has been changed. When the bottom layer is unsaturated a no-flow condition is imposed. There can no longer be an upward flow from the groundwater into the soil profile.

2) The degradation rate dependence on soil water content, F_w , (eq. 74) has been changed based on the results presented by Schroll et al. (2006):

$$\begin{aligned} F_w &= 0 & , \theta < 0.5\theta_w \\ F_w &= \left(\frac{\theta - 0.5\theta_w}{\theta_{100} - 0.5\theta_w} \right)^B & , 0.5\theta_w < \theta \leq \theta_{100} \\ F_w &= 1 & , \theta > \theta_{100} \end{aligned}$$

where θ_w is the water content at wilting point and θ_{100} is the water content corresponding to a pressure head of -100 cm.

The following has changed from version 5.1 with respect to the graphical user interface:

- Menu “File”
 - new item “Save to parameter file” has been added. This is further described in the MACRO 5.2 users guide
- Menu “Edit”
 - the order of menu items has changed in order to better reflect the normal working order when setting up a simulation
 - Menu item “Properties” has been renamed to “Soil properties”
- Menu “Tools”
 - sub-menu “Compare with measured” has been removed
 - menu item “Compute goal function”, previously under sub-menu “Compare with measured” is now a menu item directly under “Tools”
- Soil properties form
 - The fields “Land use” and “Classification” have been removed

- Options form
 - The options for crop has been moved to tab “Site management” from tab “Crop” which has been removed
 - The option to simulate surface sealing (crust) has been removed
- Parameters form
 - New columns, “STARTYEAR” and “HARVESTYEAR”, have been added in the crop table in tab “Crop”
 - New pedotransfer functions have been added to tab “Physical”. This is further described in the MACRO 5.2 users guide

References

Schroll, R., H.H. Becher, U. Dörfler, S. Gayler, S. Grundmann, H.P. Hartmann, and J. Ruoss. 2006. Quantifying the effect of soil moisture on the aerobic microbial mineralization of selected pesticides in different soils. *Environmental Science & Technology* 40:3305-3312.