



How adaptation strategies of crops could counteract climate change effects? The case of four catchments in Wallonia, Belgium.

Alexandra Bauwens, Catherine Sohier, and Aurore Degré
ULG, Gx-ABT, Soil - Water Systems, Gembloux, Belgium (alexandra.bauwens@ulg.ac.be)

A sharp increase in extreme heat and drought stress is projected in Belgium by the end of the 21st century, with the potential to significantly reduce crops' yields under current agricultural practices. This contribution uses an agro-hydrological model in order to assess the potential effects of climate evolution on crop development, yield, and water balance for the main agricultural productions in the Meuse catchment. Erosion risk is also evaluated.

We show that grasslands and maize yield decrease and yield variability increases under climate change scenarios. The leaf area index study permits to put in emphasis the earlier start of the vegetation due to warmer climate. It appears that all the sensitive stages occur earlier in the season and that crops are negatively affected by summer drought stress.

The better understanding of crops development under evolving climate allows us to propose some changes in agricultural practices and to assess their effectiveness.

We evaluate different strategies of adaptation in agricultural practices in order to reduce the potential negative effects of climate change on grasslands and maize production. Adaptation strategies proposed are advanced sowing and harvesting date, introduction of a cover crop for maize and advance in the cutting dates for grasslands.

In the particular case of the Vesdre catchment, shifting the growth period of maize permits to avoid the water-deficit period and allow increased yield. This shift makes it possible to introduce a cover crop that will drastically reduce winter soil erosion. For grassland, the adjustment of the cutting dates favored the first cut and the earlier start of the vegetation. The second cut is less profitable due to summer drought stress. The vulnerability assessments focused on the main rotation encountered in the cultivated areas and in the difference in the cover type of these crops.