

Soil—Water Systems

Which agriculture can face climate change?

Focus on varietal adaptation

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Study context

Heat wave, drought, more rain and higher temperature are just few hazards agriculture may face on at the end of the century. Negative effects as well as opportunities may be encountered. But in all case, ADAPTATION will be necessary.



Study area

Adaptation of maize is considered in Wallonia, Belgium for the end of the century under 2 climate change scenarios wet/dry (CCI-HYDR). Maize is present in all regions of the Meuse catchment.

Stresses / positive effects of CC

- . Faster start of the crop
- . Heat and drought stress in summer
- . Shortened growing season
- . Increased yield variability
- . CO2 fertilization

Key factors for crop growth

- . Accumulation of heat
- . Length of the day
- . Availability of the water
- . Nutrients
- . Atmospheric CO₂
- . Variety of the crop
- . Management practices

Optimization of the crop

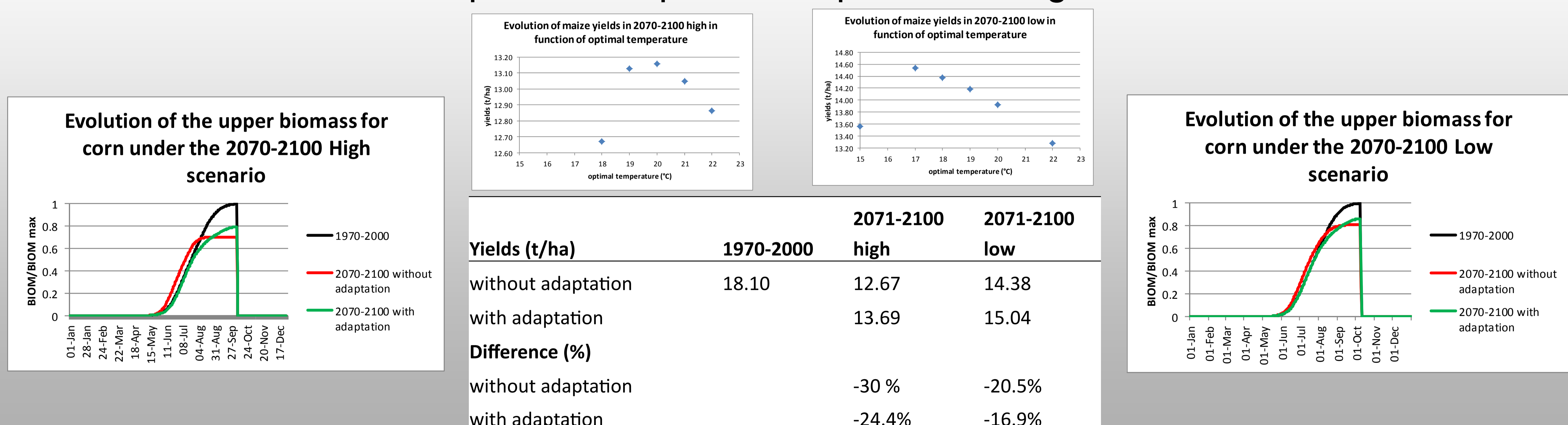
- . Adaptation of seeding and harvesting dates
- . Development of varieties more resistant to drought and/or heat
- . Varieties with longer growing season

Effects of climate change on actual maize and consequences of adaptation

2070-2100 High

2070-2100 Low

Adaptation of optimal temperature for growth:



Adaptation of corn variety can diminish by a quarter the negative impacts of climate change on yields. Maize is a C4 crop and cannot take advantage of the CO2 fertilization like C3 crops. Moreover, it is important to mention, that variability of yields will be exacerbated with climate change. Conclusions are sensitive to climate change scenarios.