iCROPM2016

Crop Modelling for Agriculture and Food Security under Global Change

15 – 17 March 2016, Berlin

Final Plenary

Some observations

- impressive amount of **high quality experimental data used for testing** and **improving crop models** for response to temperature and heat stress
- outstanding presentations of **new approaches** for simulating physiological mechanisms of **heat stress, freeze-kill, ozone damage, phosphorus limitation, C and N metabolism, fluxes via xylem and phloem, and soil C/N mineralization**
- New viable models of **intercrop competition**
- Both **data and model comparison** are used **to improve crop models** for heat, CO2 and O3 >> "heat is still hot"
- But…: **relative importance of water scarcity** for food security as compared to temperature

Some observations

- Using a **number of crop models in parallel**, and decomposing uncertainty and assessing the mechanisms for yield reduction in each model, can lead to robust **identification of climate drivers**
- Use of **model ensembles to quantify uncertainty**
- **Quantity of models vs. model quality**
- Large **uncertainty in regional impact assessments** (different sources…)
- **Wide range of model applications** >> suitability and different types of crop models?
  - Range of crops and cropping systems, but majority of studies refer to main crops; wheat, maize, rice,… sugarcane, sorghum, barley, yam, …
  - Range of environments and cropping systems
- Impressive **array of methods and tools used for risk assessment**, including: process-based models, statistical models, aircraft, crop-climate indices, household surveys, tablets, GIS, impact response services and brains

Some observations

- **Coupling process-based disease models with plant growth models** allows more accurate predictions of the spread and intensity of plant diseases.
- Through capturing for example below and above-ground competition and **interactions between plant growth and insect herbivory, functional-structural plant models** could be an interesting complement to conventional crop models
- **Impact response surfaces are a powerful tool for visualization** and exploration of differences in simulated plant responses
- Promising development of **software environments for the development and deployment of crop models** that support modelers to provide reliable simulation results and to transparently document the modelling process.
- **IT infrastructures to support multi-model simulation systems** and to support regional climate impact assessments.

Ouestions

(1) What are the key challenges in crop modelling in the near future?

(2) For which of these challenges is progress in crop modelling insufficient?

(3) What are important reasons for insufficient progress in crop modelling?

(4) What can be done to overcome gaps and obstacles?

Key challenges?

- Data >> big data
  >> new ways of data generation
  >> new methods of data analysis and use >> machine learning
- Models >> Calibration >> shared standards
  >> link to genetics, FSPM, economics, …
  >> different paths for crop models?
  >> “Fresh start”? >> “re-innovation!”
- Credibility of studies >> quality assurance of models (& model users?)
  >> Training crop modelers
- Goals >> problem solving
  >> uptake and impact
  >> documentation of impact
- Community issues >> organization of community

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Modelling grassland-livestock systems under climate change

15-16th June 2016
Potsdam, Germany

Submission deadline **18th March**
Registration deadline **1st May**

The Research Council of Norway

More information soon to be posted on AgMIP List-serve
and
www.agmip.org

Assessing climate change adaptation and mitigation options: The regional and policy dimension

Tromsø – Trondheim, Norway
on board of the Hurtigruten Coastal Express
9-12 October 2016

Submission deadline **15th April**
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MACSUR cross-cutting workshop 2016-10-13
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NORWEGIAN INSTITUTE OF BIOECONOMY RESEARCH

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Thank you

and

Have a save trip home