Intercomparison of timothy models in northern countries

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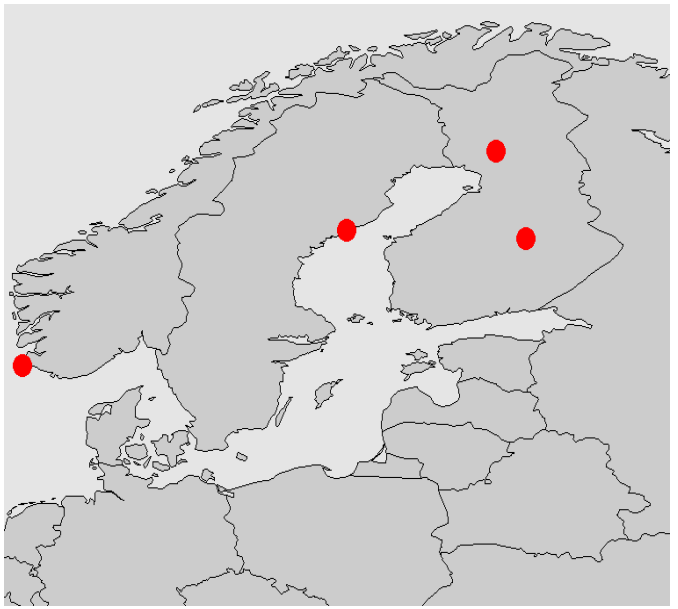
Background

- Forage-based livestock and dairy production are the economic backbone of agriculture in many northern countries.
- In northern Europe and eastern Canada, forage grasses are commonly grown intensively for silage and hay as a part of crop rotation.
- In those regions, timothy (*Phleum pratense* L.) is one of the most widely grown grass species.
- Models that simulate the development of yield and nutritive quality have been developed for timothy, but the performance of different models has not been compared so far.

Partners and models



Partners:

Finland - Luke (CATIMO) - coordination
- Panu Korhonen/Taru Palosuo
- Perttu Virkajärvi/Pekka Kalliainen (data)

Norway - BIOFORSK (BASGRA)
- Mats Höglind
- Tomas Persson

Sweden - SLU
- Anne-Maj Gustavsson (data)

Canada - AAFC (STICS)
- Guillaume Jégo
- Gilles Bélanger

Three grassland (timothy) models:
- STICS
- CATIMO
- LINGRA/BASGRA

Data from 7 sites (4 in Northern countries, 3 in Canada)

Models

- LINGRA/BASGRA
  - timothy specific model modified from perennial ryegrass specific model (Höglind et al. 2001)

- CATIMO (CAnadian TImothy MOdel)
  - originally developed for simulating the development of yield and nutritive quality of timothy (Bonesmo et al. 2002)
  - recently translated from Stella into R-environment to allow more flexible use

- STICS
  - general multi-species model calibrated recently for timothy (Jégo et al. 2013)

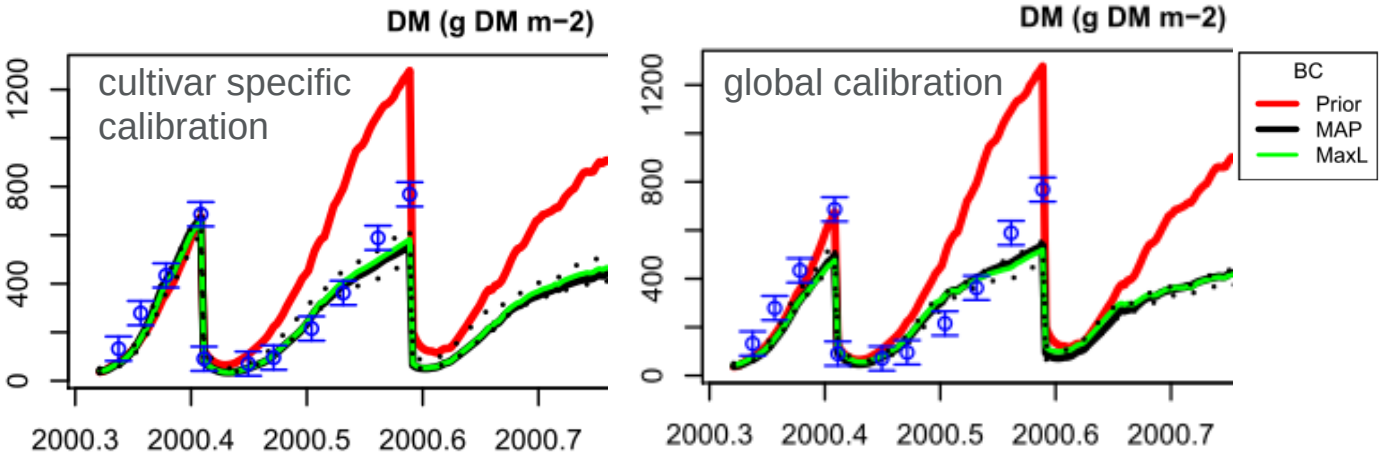
- All models simulate the development of dry matter yield and other variables on a daily time step

Datasets and calibration

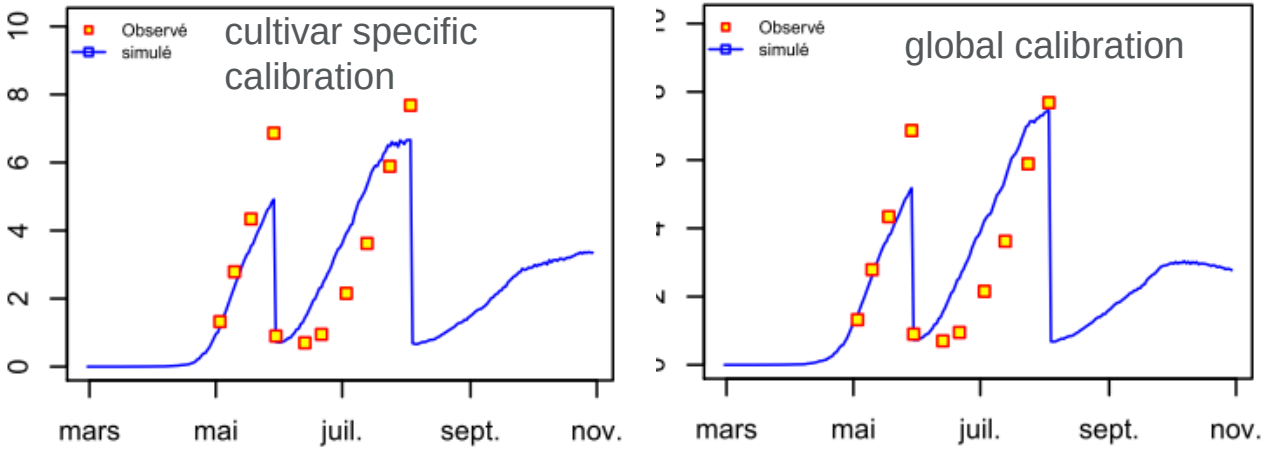
- Datasets used for the calibration include measured time series with multiple variables of the development of 1st and 2nd yield
- All data is used for calibrations → no independent validations
- The performance of the models will be tested by simulating all sites and years with both the 6 cultivar-specific parameter sets and the global parameter set
- Calibrations have just been started and are carried out independently for each model

First runs with BASGRA and STICS (dry matter yields in Saerheim)

BASGRA:



STICS:



Conclusions and next steps

- The results will provide information about
  - the uncertainties related to yield predictions of different timothy models
  - the strengths and weaknesses of different modelling approaches
  - the sensitivity of models to cultivar-specific parametrisation

- Work recently started – still possible to include more models
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- Possibility to continue with similar timothy model comparisons from the aspect of nutritive quality during MACSUR2

Thank you!

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