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:

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)
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!