

# FASSET model

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## The FASSET farm model ([www.fasset.dk](http://www.fasset.dk))

- A whole-farm model of C and N flows and of farm production
- Focuses on estimation of farm management effects on carbon and nitrogen flows, in particular of emissions of reactive N species.
- Dynamic and deterministic model, daily time steps
- The flows and emissions are mostly simulated through mechanistic modelling of interactions in the physical and biological systems involved.
- The model was initially designed to evaluate effects of N-taxation policies applied at farm level, but has later been applied in a range of other policy evaluation contexts



# FASSET simulations have been used in studies of

- Nitrogen uptake in catch crops
- N dynamics in organic farming systems
- Effects of climate change on production of winter wheat
- Long-term C and N dynamics in soil
- Evaluation of environmental and economic effects of N-taxes
- N-response in different crops
- N<sub>2</sub>O emission



# FASSET crop and soil model

- Phenological model
  - Temperature and photoperiod
- Leaf area index model
  - LAI development depend on temperature and nitrogen
  - Drought increases senescence and reduces expansion
- Dry matter growth model
  - Radiation use efficiency
  - Nitrogen and water effects on RUE
  - Allocation (roots, aboveground and grain) depending on phenology
- Soil model
  - Water flows
  - Carbon and nitrogen dynamics



# FASSET input/output

- Input (ASCII)
  - Daily climate data (temperature, rainfall, radiation)
  - Crop management
  - Soil (profile)
- Output (ASCII)
  - Daily outputs
  - Annual indicators
- Automatic export/import from Excel / Access