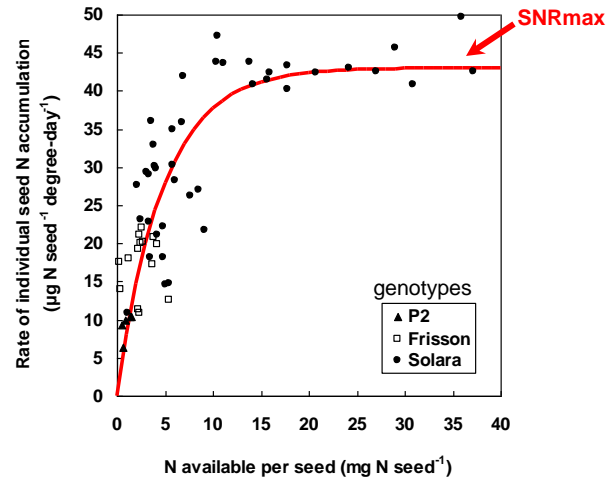
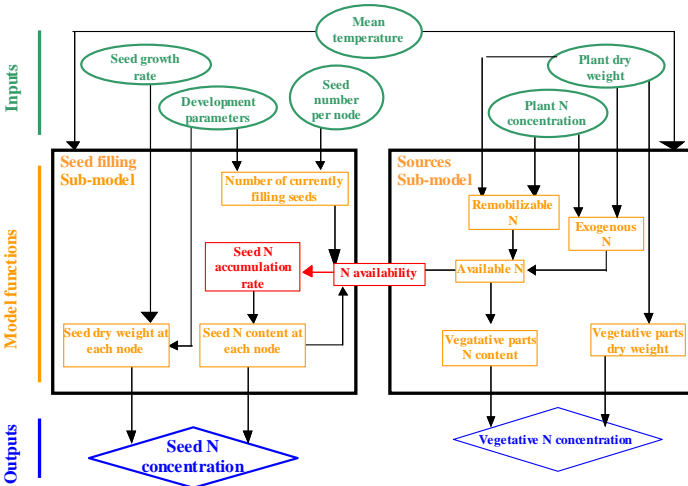


Modelling nitrogen partitioning to filling seeds in pea : a tool to predict seed N concentration

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Seed nitrogen concentration is one of the main quality criteria in grain legume crops.

How can be seed N concentration at harvest simulated in pea (*Pisum sativum* L.) ?



A dynamic *crop model component* simulating N partitioning was developed in order to predict seed N concentration at harvest.

Calculations are done for a mean stem for a one day period during the seed filling period (1)

The rate of seed N accumulation is estimated as a function of the plant N available per seed (2).

The parameter "maximum rate of seed N accumulation" (SNRmax), has been demonstrated to vary among genotypes (1)

Evaluation of the crop model component

23 independent field situations

✓ four genotypes

Baccara, Solara, Frisson

P2 (a non-nodulating mutant of Frisson)

✓ various N nutrition levels

✓ 3 years in 3 locations in France

Dijon, Roupy and Epehy

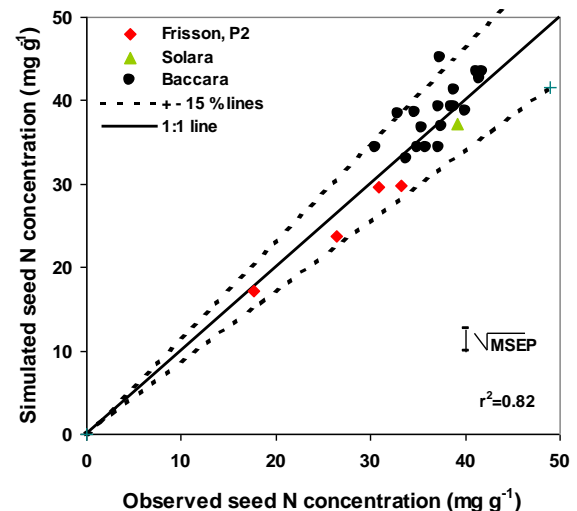


Photo UNIP

The estimation of seed N concentration by the crop model component is good ...

- high coefficient of determination ($r^2 = 0.82$)
- low root of the mean squared error of prediction ($\sqrt{\text{MSEP}} = 2.7 \text{ mg g}^{-1}$)

... but need precise input variables ;
it could also be further improved by integrating stresses effects.



(1) Larmure A., Munier-Jolain N. G. (2004) *Field Crops R.* 85, 135-148.

(2) Lhuillier-Soundélé A., Munier-Jolain N.G., Ney B. (1999) *Crop Sci.* 39, 1741-1748.

(3) Sinclair T.R. and De Witt C.T. (1976) *Agron. J.* 68,319-324.

What the crop model component simulating N partitioning offers :

- A tool to improve the understanding of "self destruction" processes during the seed filling period in pea (3)
- A valuable part of a larger model simulating pea yield and seed quality