

Field pea and nitrogen in crop rotation



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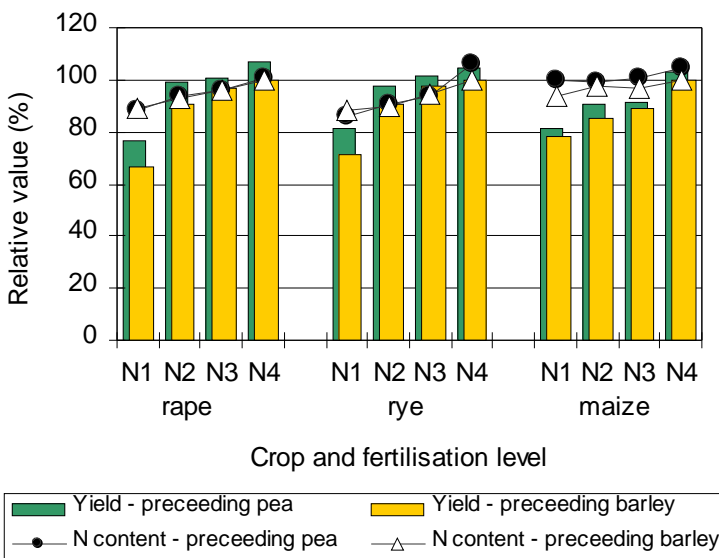
Objectives

Nitrogen fixed by grain legumes corresponds to a quantity of fertiliser to be managed. Trials were carried out to:

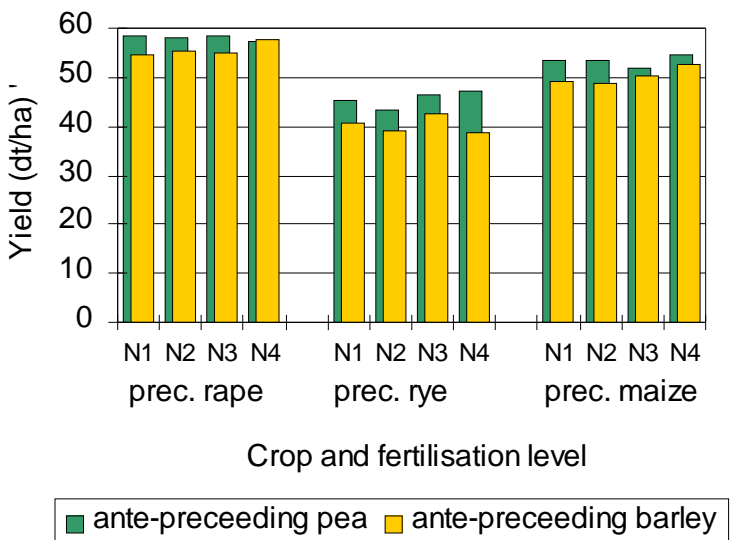
- quantify nitrogen availability to crops following pea
- quantify nitrogen balance at crop and rotation level
- quantify energy value of fixed nitrogen

Fertilising value

- 0 à 20 kg N/ha for maize preceded by a cover crop
- 30 à 40 kg N/ha for winter rye
- 40 à 60 kg N/ha for winter rape



- Phytosanitary and fertilising effects are observed on winter wheat 2 years after pea



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Conclusions

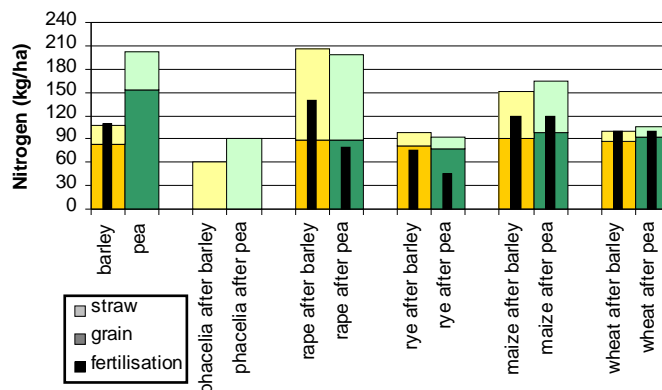
- Field pea in crop rotation allows effectively to reduce mineral fertiliser applications up to 175 kg N/ha and non-renewable energy use up to 20%

Experimental design (2 series of 3 years)

	1	2	3	4	5	6
Year 1	Winter barley			Field pea		
N fertilization	115 kg N/ha			No N fertilisation		
Year 2	Phacelia / Maize	Winter rape	Winter rye	Phacelia / Maize	Winter rape	Winter rye
N1 to N4	0 to 120 (kg N/ha)	0 to 110	0 to 90	0 to 120	0 to 110	0 to 90
Year 3	Winter wheat					
N fertilization	120 kg N/ha					

Nitrogen balance

- The saving in fertiliser varies from 115 to 175 kg N/ha



Energy value

- Non-renewable energy needs for pea cultivation are 30% lower than for barley
- After pea, energy needs are 10% to 15% lower for rape and 10% for rye

Nmin

- Mineralisation of pea nitrogen requires an adequate management of rotation and fertilisation in fall and spring

Nmin - phacelia/maize according to preceding (series 1 and 2)

