



**Coordinator(s) :** *Raphaël Charles, Marina Wendling*  
**Institute :** *FiBL*  
**Location :** *Swiss Plateau*  
**Climate :** *Semi-continental, annual rain fall = 800-1200 mm*  
**Soil and practices :**  
*Clay-loam soil, plough & reduced tillage*  
**Organic**  
**Date of 1st implantation:** *Spring 2018*



## 1. The MAP context:

The first target of current local agriculture is to produce more legume species in order to increase the local supply of proteins. Alternatives concern the choice of legume species, but also of the choice of the cereal species according to the requirements of the market. There is also a wish to find alternatives to reduce or suppress the use of chemical plant protection products, in particular to compete against weeds.

## 2. Partners in codesigning

### Main actors involved :

- Local advisory services in organic farming : already set up on-farm experiments, want to facilitate the spreading of locally adapted crop mixtures
- Collecting centres and mills : collection, sorting and transformation of the grains, want to enhance the production of local proteins

### Farmers :

Ten farmers interested in growing new crop mixtures or in precision agriculture machinery. They choose the mixtures that will be grown on their farm and will make all cultivation operations. Some of the farmers involved regularly grow crop mixtures, for others it is a new experience

### Other stakeholders :

Machine manufacturers : develop precision farming machinery adapted to the seeding of crop mixtures

On-farm demonstration have been discussed during a workshop with advisor in organic farming and on the annual meeting on organic field crops. A questionnaire helped to discuss the state of knowledge and the main challenges. Crop monitoring will be made with local advisory services in organic farming. Trial visits will be organised during the growing period with all the partners involved. These visits will be open to all persons interested in crop mixtures in particular to farmers.

## 3. The crops mixtures in the MAP

The crop mixtures were proposed by the farmer or chosen among a list of possible associations

Two types of experiments :

- New crop mixtures : mixtures associating lupin and a cereal. Objectives : Determine climate and soil conditions (active lime, pH) required for these mixtures, choice of lupin variety, optimal seeding technique and densities of both crops, best adapted partner for lupin. Based on the results of previous experiments, lupin-oat will be grown in each satellite farm and additional combinations will be tested according to farmer wish.
- Current crop mixtures (pea - wheat) : use of precision farming machinery to seed each crop at optimal depth in order to improve the performance of the mixture. Only on the "mother trial".



Lupin + spring oat



Lupin + winter triticale

### Crop mixture : lupin - oat

This combination was the best among several associations including lupin tested previously by the FiBL. The eco-services is the local production of proteins, the supply of N to the following crop and an efficient weed control. Modalities tested by farmers are seeding densities, associated crop, lupin variety, seeding technique.

March: seeding of the 2 species  
 Seeding density, associated crop,  
 lupin variety, seeding depth,  
 seeding technique

April-May Weeding

Red : Modality adapted for mixing species

Black: Modality same than in sole cropping.

Blue : experimental treatments for comparison

Feb-March  
 Soil preparation

March Soil analysis  
 (active lime, pH, texture)

August: Harvest and  
 sorting of the two crops

## 4. Next steps: Seeding of crop mixtures including lupin, soil analysis, crop monitoring, interviews, field visit

