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INTERCROPPING LENTIL AND WHEAT TO IMPROVE PRODUCTIVITY IN ORGANIC FARMING

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Context

- Interest in **Lentil** (*Lens culinaris*) is **steadily growing** for human consumption in France & EU
- Demand in organic lentil is higher than the supply in France
- Organic lentil **productivity is low and instable**
- Growing lentil in mixture could be a way to **support farmers** in fulfilling consumers demand

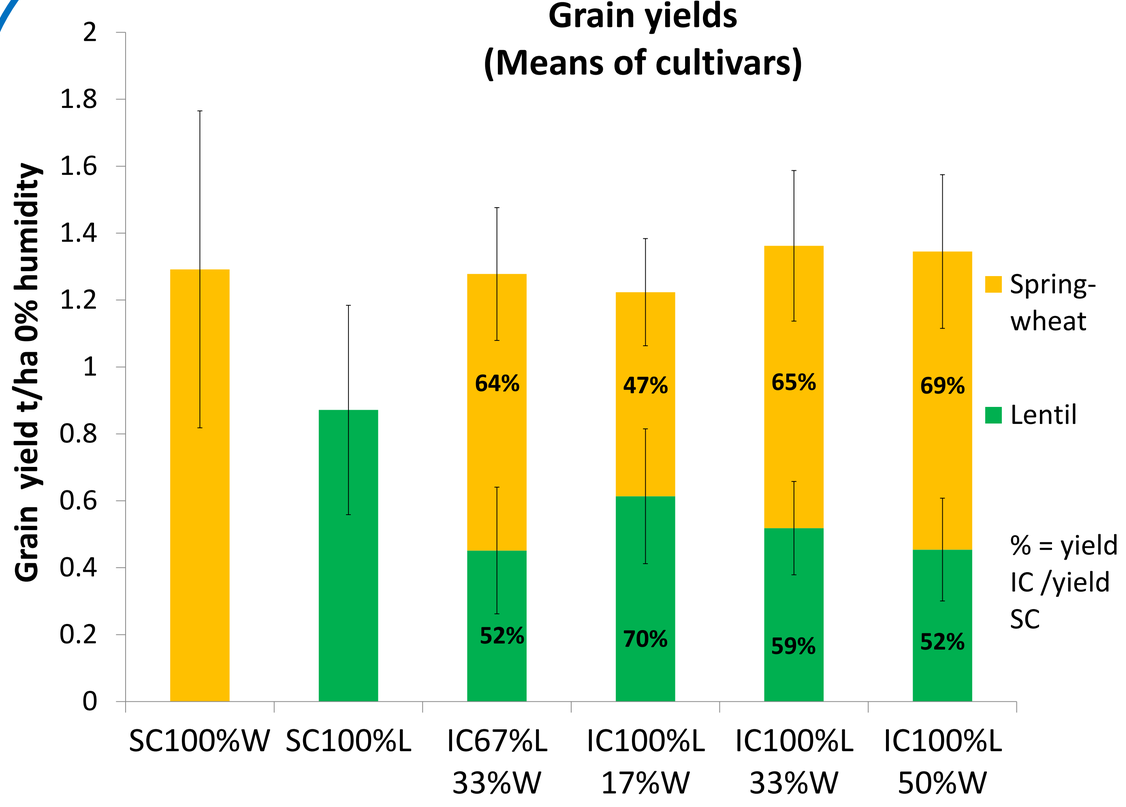
Objectives

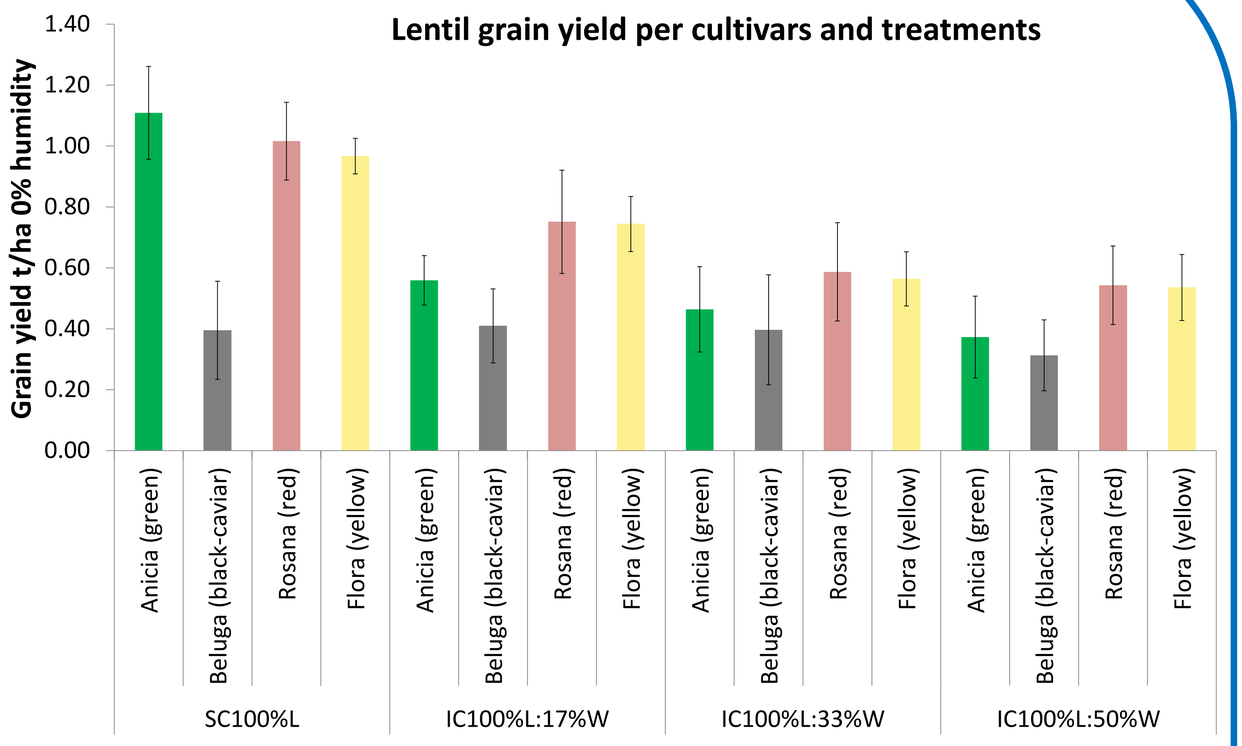
1. Analyse the **functioning** of lentil-spring wheat mixture or intercrops (IC)
2. Evaluate their performances for **yield improvement/stabilization** and **income**
3. Find the **best combinations of cultivars and sowing densities** for organic farmers

Materials & Methods

- Field experiment was conducted in 2015 under **organic agricultural conditions**
- 4 cultivars of lentils (L) and 2 of spring wheat (W) were grown as sole crops (SC)
- **32 bi-specific intercrops** (4 lentil cv. x 2 wheat cv. x 4 seeding ratios) were evaluated
- Both species were **sown** and **harvested** together at the lentil ripeness stage
- Grain yield, yield components and Nitrogen acquired were measured
- Grain sorting of bi-specific mixture was carried out in post-harvest

Results





- **Total intercrop yield ≈ wheat sole crop > lentils sole crop**
- **Wheat always dominated** lentil particularly for the 67%L/33%W and the 100%L/50%W density ratios
- Lentil grain yield in IC lower than in SC due to strong **interspecific interactions** produced by wheat on lentil
- **In SC, Anicia, Rosana and Flora** yields were higher than Beluga
- **In IC, Flora and Rosana** yields were higher than Anicia and Beluga
- Cv. Beluga yield was **similar in IC than in SC**
- **The higher the wheat density, the lower the lentil grain yield** without increasing the total IC yield

Conclusions & perspectives

- Lentil-spring wheat intercrops are of great interest in organic farming to **improve yields & income** (incl. grain sorting)
- **Intercrop efficiency** due to the **complementarities of both species for the use of abiotic resources**
- To favour the lentil yield (the most profitable crop), **wheat density** must remain low (< 33%) and lentil sown at 100%
- **Harvest efficiency** of lentils in IC compared to SC seems better, but other results are needed to verify the agronomic and economic advantages obtained in this experiment

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