OUTLINE

1. Organic farming & arable crops in France
2. Organisation of research in OF in France
   The key-role of ITAB
3. Issues raised by organic farmers
4. Research themes
5. Focus on some research programmes
   - Common bunt
   - Wheat variety testing
   - Long term experiments
   - Alfalfa as fertilizer
   - Mechanical weeding (if time)
5. FOCUS ON SOME RESEARCH PROGRAMMES
Propagation by soil

Propagation by seeds
Products allowed in OF

Approbation of products against common bunt on cereal seeds

Tests of products and methods

- Cerall (*Pseudomonas chlororaphis*), 2012
- Tillecur
- Copper compounds
- Acetic acid (white vinegar)
- Essential oils, flour + milk, …

29 valid trials (high contamination level)
SERED TREATMENT: RESULTS

For all graphics: control in grey, product in green (% contaminated ears). Red dots = % efficiency

- Cerall (1 l/q)
  Significative but irregular results

- Tillecur (1.3 kg/q)
  Good efficiency, sometimes insufficient

- Essential oils, flour + milk, …:
  Disappointing results (for quantity used)
- Acetic acid (CH₃COOH)
  Promising treatment. Prospect: test quantity and combination with other product…

Résultats acide acétique (Vinaigre blanc 1,8 à 2,5 l/q ) - 7 tests
Copper (several compounds)

Very good efficiency with quantity > 200g Cu/100 kg of seeds. Stay significative with reduced quantity (20 g Cu/100 kg of seeds).

Prospect: test quantity, type of compound, effect on germination.
Significant differences between control and conventionnal treatment, some promising results.
Experiments from 2001 to 2011: about 100 wheat varieties tested, + main cereal species cultivated in OF
SUSCEPTIBILITY OF CEREAL SPECIES

- **3 trial sites** (91; 26; 89)
- **Inoculum**: local common bunt, from local contaminated ears
- **2 to 9 varieties by specie** (not including soft wheat)

- **Hard wheat & spelt** are susceptible to soft wheat common bunt inocular
- **Triticale, rye, barley & oat** are not susceptible to the inocular used in trials.
Very significant effect of variety. (but results with few bunt inocular)
Significative interaction: most varieties rank identically in both sites (and the resistant are common), but one variety (Hendrix) rank differently.

This may be related to the difference of common bunt strains.
Priority to **prevention**!  
=> Have diversified crop rotation, use healthy seeds, favour good sowing conditions, observe ear before harvest, observe harvest, conduct analysis in case of doubt…

**Solutions do exist = combination of solutions**

**Variety choice**

→ We need to better know the common bunt strains in each region
→ Breeding

**Seed treatment is a resort**

- If necessary, keep testing products (with germination tests)
- A important issue: what about approbation? (pesticide regulation, natural substance in particular)
- What about thermoseed?
ITAB coordinates since the early 2000’s a national screening network in organic cereals (mainly bread winter wheat).
Wheat:
- Is the first crop cultivated in organic (arable crops)
- Is an important cash crop
- Is mainly used for milling (bread)

In 2012/13, about 20% of organic wheat were imported. Objective is to be self-sufficient.
A REQUEST FOR MORE VARIETIES

Source FranceAgriMer

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Varietal offers progresses slowly…

Producers and stakeholders ask for:
- Varieties adapted to OF
- More choice of varieties

Objective of the screening network is to answer that request
Objectives:
- Find stable and performant registered varieties
- Assess lines bred for OF

Main traits requested:
- Yield
- Quality
- Good nutrient uptake
- Diseases resistance
- Weed competition
- Height
- ...

Type of variety assessed:
- Conventionnal varieties, registered on french catalog
- Organic varieties coming from Europe (Austria, Switz.)
- French organic varieties (recent)

Complementarity to other research programmes:
- Breeding for OF
- Dynamic populations
- Network coordinated by ITAB

- On-farm trials conducted by various partners (Chambers of agriculture, Arvalis, Inra, Farmers’ association, cooperatives…)

- About 40 trials in wheat, 15 in triticale, some in other cereals (few), each year

- Results on agronomic traits: field trials

- Results on quality traits: samples from field trials are analyzed (baking test)

More than 10 years of results
Currently: 26 varieties published!
(5 more to come in spring)
On line at http://www.itab.asso.fr/itab/varietes-bles.php
2 lines were registered in OF in 2012 (french catalog)

First time in France!
Collaborative work
INRA – ITAB + 8 partners from the network

ORGANIC VCU TRIALS SINCE 2010
ITAB coordinates the « RotAB network »: a network of 13 long term experiments in organic arable crops
ROTAB NETWORK IN FIGURES

14 experimental sites

- Kerguéhennec
- La Saussaye
- Rotaleg - Thorigné
- Archigny
- La Hourre
- Domaine de Melgueil
- La Motte
- Boigneville
- Mirecourt
- Thil
- Corbas
- Plate-forme TAB
- Dunière
- Le Logisson

> 9 years old  3 < years old < 9  < 3 years old
ROTAB NETWORK IN FIGURES

26 innovative cropping systems

424 ha

174 plots in trial

Thousands analyses & data

20 partners
To assess innovative cropping systems

INNOVATIVE

=> Systems with a high level of constraint
   - No manure, no external fertilizers, no tillage...
   - Numerous legumes in crop rotation, intercropping, functionnal biodiversity...

ASSESSMENT

=> Performances, sustainability, resilience
   - Do systems reach objectives in spite of high constraints?
   - Are technical, sociological, economical, environmental results satisfactory? Which are the bottlenecks?

To identify the best strategies
A NETWORK TO SHARE KNOWLEDGE AND METHODS

On farm or on experimental station

Different types of soil
Different climates
1 to 11 years’ old
2,3 to 64 ha

Plots 0.15 to 8 ha
1 to 5 cropping system assessed on one site

Diversity is the wealth of the network
A NETWORK TO SHARE KNOWLEDGE AND METHODS

A NETWORK:

- To share methods, competences & expertise, to produce common tools to assess and analyze systems
- To connect researchers, advisers, trainers and farmers
- To pool knowledge and know-how of all « practionners » (people in the field: technician, engineer, farmer, researcher…)
- To produce and disseminate results together

Pooling allows saving
A common tool-box has been produced
Collaborative work is favoured
Fertility: beware of P! (and weeds…)
RotAB network provides support for research projects to:

- Assess globally cropping systems
- Conduct measures that can’t be done on an classical on-farm trial

A new project just started in 2014, objectives are:

- To follow weed evolution
- To follow soil fertility (N, P), mycorhizes on some sites
- To assess economical, sociological and environmental results of all systems (sustainability)

⇒ Impact of legumes in crop rotation (alfafa, intercrop, green manure…), of ground cover (crop, intercrop), of no till…