

# TILLAGE IN ORGANIC FARMING IN FRANCE

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**AIM:** description and comprehension of tillage systems of French farmers, including all the technical operations of weed control. Results of the survey will help to build a research program on tillage impacts on soil quality and crop production in OF.

**METHOD:** the survey concerned 68 farmers in 3 different areas (figure 1).

## TILLAGE SYSTEMS OF ORGANIC FARMERS :

3 types of tillage systems:

1. **traditional ploughing** (45 %), i.e. a mould board plough at 20-30 cm depth,
2. **alternation of ploughing and no ploughing** in the crop rotation (30 %),
3. **no ploughing** techniques (25 %), i.e. deep tillage without soil inversion, shallow tillage with tines or disks, and no tillage or very superficial with rotary harrow.

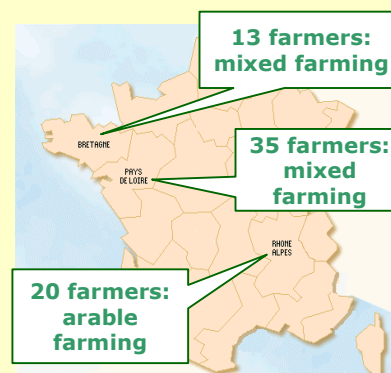


Table 1: Strategic criteria for the choice of tillage system

| Traditional ploughing                   | Alternation ploughing/no ploughing in the crop rotation   | No ploughing  |
|---|---|---|
| 50% Weed control<br>30 % Soil structure | For no ploughing :<br><b>60 % Biological soil quality</b><br>50 % Working time and fuel consumption<br><br>For conservation of ploughing :<br>15 % Weed control for spring crop | <b>75 % Biological soil quality</b><br><br><b>25 % Working time and fuel consumption</b><br><br>10 % Weed control |

## CHOICE OF TILLAGE SYSTEMS (table 1):

Traditional ploughing is used to control weeds and improve soil structure, and no ploughing to preserve soil biological quality.

## MAIN PROBLEMS (table 2):

No ploughing involves more problems than traditional ploughing.

Whereas decrease of working time is a reason to adopt no ploughing, mechanical weed control involves an increase of working time.

Table 2: Main problems with tillage systems

| Traditional ploughing                             | Alternation ploughing/no ploughing in the crop rotation   | No ploughing   |
|---|---|--|
| <b>75 %: No problem</b><br><br>25 %: Working time | <b>50 %: No problem</b><br><br>For no ploughing :<br>30 %: Weeds and slugs problems<br>10 %: Materials<br>For conservation of ploughing:<br>10%: Working time | <b>45 %: No problem</b><br><br><b>20 %: Working time</b><br>10 %: Materials<br>10 %: Weed control<br>10 %: Soil compaction |

Two main topics are raised regarding: (1) technical feasibility of no ploughing, for instance : how to control weeds without ploughing ?, and (2) improvement of soil quality, what impact on the crop production ? (table 3)

Table 3 : Main questions raised by farmers to adapt their tillage systems

| Traditional ploughing  | Alternation ploughing/no ploughing in the crop rotation                                    | No ploughing   |
|--|--|--|
| 30%: No question<br><br><b>30%: Need of research on material, direct weed control</b><br><br><b>25%: Impact of tillage on soil quality ?</b> | 50 %: No question<br><br><b>50 % : Need of research on direct drilling, inter cropping</b> | <b>50 % : Need of research on weed control</b><br><br>30 %: No question<br><br>20 %: Impact of tillage on soil quality ? |