Introduction

In organic orchard, tillage methods used to control weed in the tree row have some drawbacks:
- these methods are time-consuming and associated with a use of non-renewable energy,
- tillage interferes with the development of superficial roots and can hurt the trunk,
- the physical, chemical and biological properties of the soil can be disturbed; erosion and runoff can potentially increase.

The cover crops could be an interesting alternative to control weed in the tree row of conventional and organic orchard.

This poster presents the effect of such alternative techniques on soil fertility and agronomic properties.

Experimental plot design

Benedicte cultivar planted in 1999 – density 4x5m – sandy/loam soil. 38 trees split in 4 repetitions / treatments – 2 treatments.

Tillage treatment (T)
Weed control – 5-7 tillage operations / year with Ommas (disc tool). Tillage depth = 15cm. Nitrogen supply: 75 Kg.ha⁻¹ in two applications in 2008/2009.

Ground cover treatment (GC)

All cropping practices except soil management in the row and nitrogen supply are the same for T and GC treatment.

Since 2005, total nitrogen supplies are twice less in GC than in T treatment. Water supply was realised with microjet and driven by tensiometer (threshold: 50cb).

Results & discussion

Birds eye view of the experimental plot

Earthworm density and biomass 2010

<table>
<thead>
<tr>
<th></th>
<th>GC</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>5th January</td>
<td>375±189</td>
<td>220±26</td>
</tr>
<tr>
<td>13th April</td>
<td>792±529</td>
<td>285±116</td>
</tr>
<tr>
<td>20th May</td>
<td>173±65</td>
<td>30±22</td>
</tr>
</tbody>
</table>

ANOVA, α=0.05. m = 4 to 8

Water infiltration rate for GC treatment was significantly higher than for T treatment but no significant difference was observed for Anecic earthworms between GC and T treatment. Water infiltration rate for GC treatment significantly less than for T treatment but no significant difference was observed for Anecic earthworms between GC and T treatment.

The ammoniacal form prevailed in the mineral soil nitrogen of GC and T treatments. Ammoniacal form increase in spring can be related to organic supplies. Whereas nitrogen supplies are twice lower in GC treatment since 2005, soil nitrogen availability is equivalent in both treatments.

Fabaceous ground cover is an efficient nitrogen source in such condition.

Yield and fruit grade are equivalent in both treatments. No negative effect of GC treatment was observed during 2004-2009 period on yield and fruit grade. Moreover, Monilia damages, which are one of the most serious damages observed in organic peach orchards, were reduced under GC treatment (Gomez and Mercier, 2008).