Olive trees intercropped with cereals and legumes in Kassandra peninsula, northern Greece

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EURAF - European Agroforestry Federation
Olive groves in Greece

Olive groves: 600,000 ha
Olive trees alone or in combination with other trees could create a unique landscape
Olive groves in Greece

Main products: Edible olives and olive oil

Secondary products: Fodder for animals and firewood
Olive agroforestry systems in Greece

Area covered: 124,000 ha

Understory vegetation

Pastures
Olive agroforestry systems in Greece

Understory vegetation

Various crops (wheat or other cereals, maize, alfalfa, or grape veins, potatoes, melons, tomatoes, beans, onions, or fava beans)
Olive agroforestry in Kassandra peninsula

The main product of the area is olive oil. Olive trees are scattered in the plots and the main crops are cereals and broad beans.
Olive agroforestry in Kassandra peninsula (State Agricultural Prison)

The aim of the study was to produce quantitative information about the intercropping of olive trees and leguminous crops or cereals

A controlled experiment of 1.08 ha area
Mean annual precipitation: 602.5 mm
Mean monthly temperature: 16.2 °C
Pure soil conditions (luvisols, soil depth 0.5 m, pH 8.2, organic matter 8.5%)
Aspect: south
Slope: 15%
Olive agroforestry in Kassandra peninsula
(State Agricultural Prison)

Olive trees: 80 years old
Tree density 100 trees/ha
Crops: Barley and a mixture of barley + common vetch
Experimental design: Latin square
Olive agroforestry in Kassandra peninsula (State Agricultural Prison)

Seeding time: December of 2014

**Seeds and fertilizers**

Treatment A (barley): Barley 240 Kg/ha and fertilizer 130 Kg/ha (24-10-0, N-P-K)

Treatment B (barley+common vetch): Barley 80 Kg/ha, Common vetch 120 Kg/ha and fertilizer 120 kg/ha (0-46-0, N-P-K)
Olive agroforestry in Kassandra peninsula  
(State Agricultural Prison)

Measurements
The crop sampling was concentrated on the area close to 6 sample trees selected inside each experimental plot and on the reference site. Crop sampling plots included plots in close proximity to the tree canopy and in the centre between the tree rows.
Treatment A: Plant density (nr of tillers/m²), height (m), heads/m² and grains per head
Treatment B: Above ground biomass
Olive agroforestry in Kassandra peninsula (State Agricultural Prison)

- Barley
- Barley + common vetch

Control

Reference plot with barley
Olive agroforestry in Kassandra peninsula (State Agricultural Prison)

**Preliminary results**

**Treatment B**

<table>
<thead>
<tr>
<th>Category</th>
<th>Edge of trees</th>
<th>Between the tree rows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry biomass yield of the mixture (t/ha)</td>
<td>6.53</td>
<td>7.88</td>
</tr>
<tr>
<td>Number of barley grains/head</td>
<td>19</td>
<td>18*</td>
</tr>
</tbody>
</table>
Olive agroforestry in Kassandra peninsula (State Agricultural Prison)

Preliminary results

Treatment A and reference plot

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Type of plots</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Agroforestry</td>
</tr>
<tr>
<td>Density (nr of plants/m²)</td>
<td>73.48</td>
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<tr>
<td>Height (m)</td>
<td>0.72</td>
</tr>
<tr>
<td>Nr of tillers/m²</td>
<td>320.28</td>
</tr>
<tr>
<td>Nr of heads/m²</td>
<td>279.12</td>
</tr>
</tbody>
</table>
Olive agroforestry in Kassandra peninsula (State Agricultural Prison)

Conclusions

- Biomass yield of the mixture (barley and common vetch) was similar close to tree canopy and between the tree rows.
- The parameters for treatment A (barley) had differences in agroforestry and monoculture plot suggesting the latest more productive.
Thanks for your attention