



C-MASC Scholar Viewpoint

FROM THE DESK OF VLADIMIR IVEZIĆ

Agroforestry systems combine permanent wood species with agricultural crops on same parcel of land which results in a positive influence on soil fertility, diversity of production in one vegetation, biodiversity, protection against plant disease, pests and weeds, better use of nutrients and water in soil, as well as increased SOC compared to monoculture crop fields. The significance of intercropping is in the cultivation of plant species in systems that are less susceptible to different stress conditions. Furthermore, agroforestry has been recognized by the IPCC (2000) to have the greatest potential for C sequestration of all the land uses analyzed in the Land-Use Change and Forestry report.

In many parts of Europe, as well as in Croatia, farmers are switching from crop production to walnut or hazelnut production as they see it as more profitable. However, walnut orchards are usually planted in very wide alleys leaving enough space to continue with crop production in-between the rows of walnuts.

The aim of our research is to investigate the interaction between grafted walnuts and agricultural crops and their influence on microclimates and, consequently, on crop yields, soil biodiversity (microbiological activity in soil and nematode community structure), soil conservation, as well as on the occurrence of plant diseases.

The five-year long field trial is set up at two locations in eastern Croatia. Each field trial consists of three parcels: the control plot of agricultural crops without walnuts, walnut orchards with intercropped agricultural crops, and a permanent walnut orchard without intercropped agricultural crops. Microclimates are monitored at all locations as well as soil properties such as infiltration, SOC, soil compaction, microbial activity and nematodes. Based on the obtained results, a computer model will be created to predict the influence of intercropped walnut systems on the investigated parameters.

One of the challenges is to determine the influence of such systems on SOC stocks and C sequestration. In the initial stage, a meta-analysis investigating the world-wide influence of alley cropping on SOC will be conducted here at C-MASC.

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Sincerely,

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