

Integrating annual crops and short rotation coppice for on-farm production of ramial wood chips – A new agroforestry trial at Agroscope

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Introduction

Ramial wood chips (RWC) is made from branches and twigs with a diameter less than 7-8 cm and originally it was used to recycle wood residues as fertilizer for forestry. The use of RWC as soil amendment seems to positively affect a set of physical and chemical soil properties promoting the formation and maintenance of a fertile soil without affecting crop yield. However, one the major issues related to the RWC is the availability of the product, currently obtained mainly from gardening residues.

Experimental design of the agroforestry trial

Here we describe the set-up of a new alley-cropping system for *in-situ* production and use of RWC at Agroscope – Nyon (Switzerland). The alley-cropping system has been installed in spring 2023 over a surface of about 1.5 ha. The system is composed of five hedgerows (6 m-wide x 120 m-long) that have been planted in March 2023 (Fig. 1). Each hedgerow is formed by four rows of *Salix viminalis* hybrids (Discovery and Endeavour) with inter-row spacing of 2m and intra-row spacing between the cuttings of 50cm (Fig. 2). The four crop alleys between the five hedgerows have a width of 24m (Fig.1). The following 4-year long crop rotation has been established: winter wheat (2023) / rapeseed (2024) / winter wheat (2025) / soja (2026) with cover crops before winter wheat and soja.



Fig. 2: Rapeseed alley and growing willow hedgrows in April 2024. Willow cuttings (50cm long) were planted in March 2023.

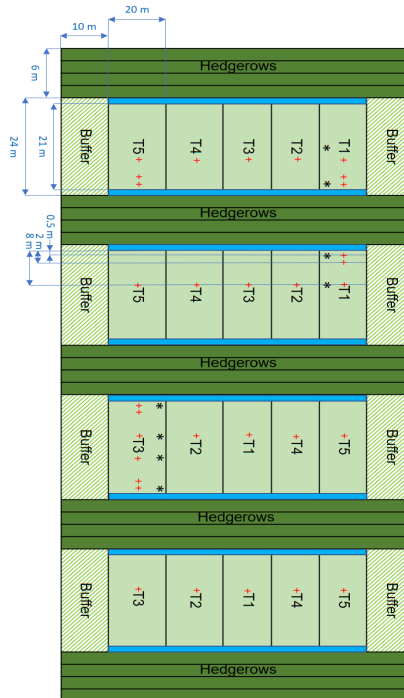


Fig. 1: Experimental design of the alley cropping system at Agroscope - Nyon (Switzerland). T1, T2, T3, T4, T5 indicate the different ramial wood chips treatments of, respectively, 0, 25, 50, 75 and 100 m³ ha⁻¹. The RWC amendment has been incorporated in autumn 2022 using a rototiller at a depth of about 10 cm. * and +: position of, respectively, micro-meteorological stations and soil moisture sensors.

Ramial wood chips treatments

Each crop alley has been divided into 5 sampling plots (20m x 21m) corresponding to the RWC treatments of 0, 25, 50, 75 and 100 m³/ha (Fig. 1). For each RWC treatment four replicates are available for a total of 20 experimental plots. In addition, control plots (12 x 6m) adjacent to the alley-cropping system, but without any influence of the hedgerows, have been set up with four replicates of 0, 50 and 100 m³/ha of RWC addition.

Research goals

We are interested to assess the minimal amount of RWC in order to increase soil organic matter, the effect of growing hedgerows on crop yields, the rate of willow growth for *in situ* RWC production. Collaborations on other topics are welcome.