



Tillage as a tool to manage crop residue: impact on sugar beet production.

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Crop residues and plant cover represent a pool of organic matter that can be used either to restore organic matter in soils, and therefore maintain soil fertility, or that can be valorized outside of the field (e.g. energy production). However, it is crucial that the exportation of residues is not done to the detriment of the system sustainability.

Three long term experiments have been settled in the loamy region in Belgium. All of them are designed to study the effect of residues management by several tillage systems (conventional plowing versus reduced tillage) on the whole soil-water-plant system. SOLRESIDUS is a field experiment where we study the impact of crop residue management while in SOLCOUVERT and SOLCOUVERT-BIS, we study the impact of cover crop management.

SOLRESIDUS was started in 2008. In this field, four contrasted crop residues managements are tested in order to contrast as much as possible the responses from the soil-water plant system. Two practices characterize the four modalities: soil tillage (ploughing at 25 cm depth or reduce tillage at 10 cm max) and residue management (exportation or restitution).

SOLCOUVERT and SOLCOUVERT-BIS were started in 2012 and 2013 respectively. In those fields cover crop management is also diverse: destruction of the cover crop by winter ploughing, spring ploughing, strip tillage (with a chemical destruction if needed) or shallow tillage (with a decompaction before cover crop sowing).

Although although the overall project aims at studying the impact of management on the whole soil-water-plant system, here we will only present the results concerning crop production (sugar beet) in SOLCOUVERT experiments. The presented data will include germination rate, crop development (biomass quantification and BBCH stages) weeds population, disease occurrence, pest occurrences, nitrogen uptake by plants, quality and quantity of harvested products.