

IMPACT OF COVER CROP MANAGEMENT ON CROP PRODUCTION: A FIELD EXPERIMENT IN WALLONIA CONTEXT

Hiel Marie-Pierre⁽¹⁾, Bernard Bodson⁽²⁾

(1) Agriculture Is Life, Unité de Phytotechnie des Régions Tempérées, Université de Liège, Gembloux Agro-Bio Tech, Passage des Déportés 2, 5030 Gembloux, Belgique. marie-pierre.hiel@ulg.ac.be, (2) Unité de Phytotechnie des Régions Tempérées, Université de Liège, Gembloux Agro-Bio Tech, Passage des Déportés 2, 5030 Gembloux, Belgique. b.bodson@ulg.ac.be

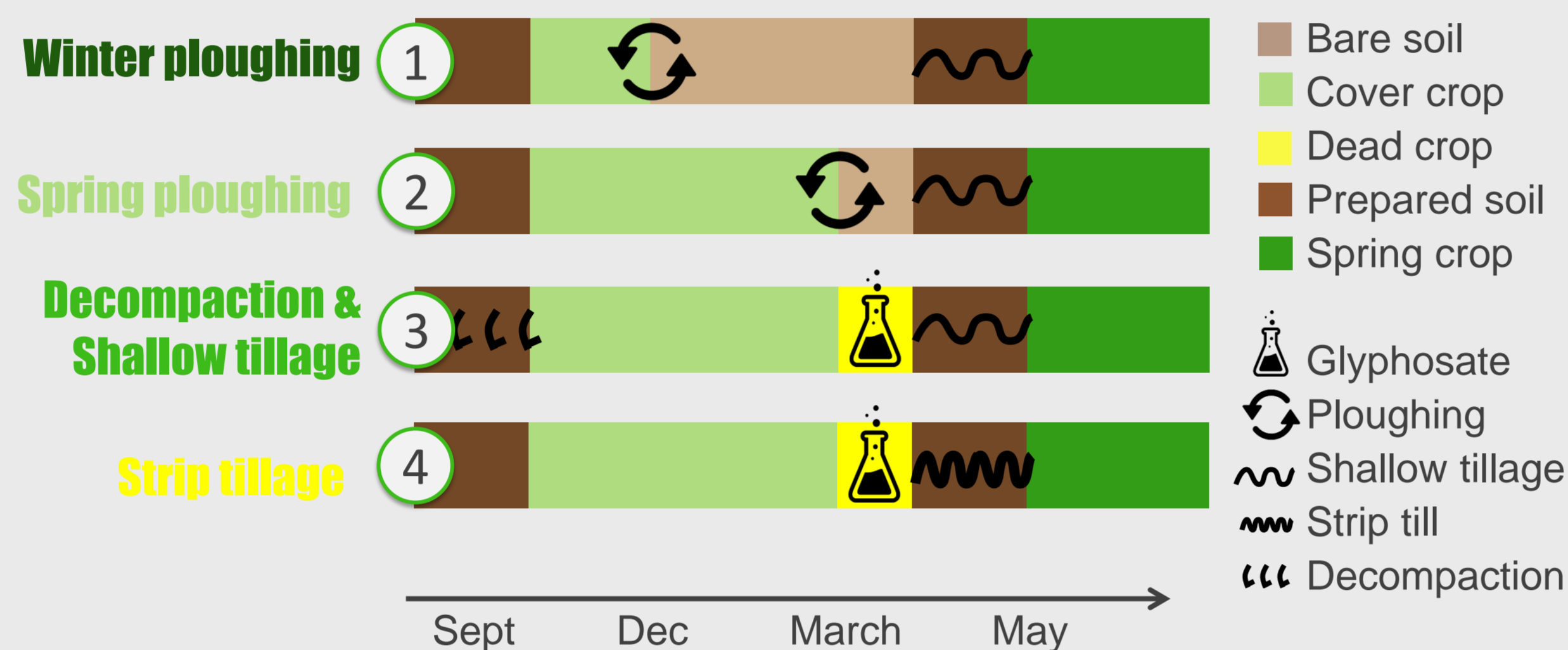
CONTEXT



In Wallonia, the main crop region is in loamy soils. Walloon farmers has now the obligation to cultivate cover crop before a spring crop (PGDA). These cover crops are firstly used to preserve the soil from nitrogen leaching but has also mainly other advantages. Nowadays's challenge is to make a good compromise between the cover crop and the main crop. How to best valorize this residue and what are the impact of cover crop management on main crop production?

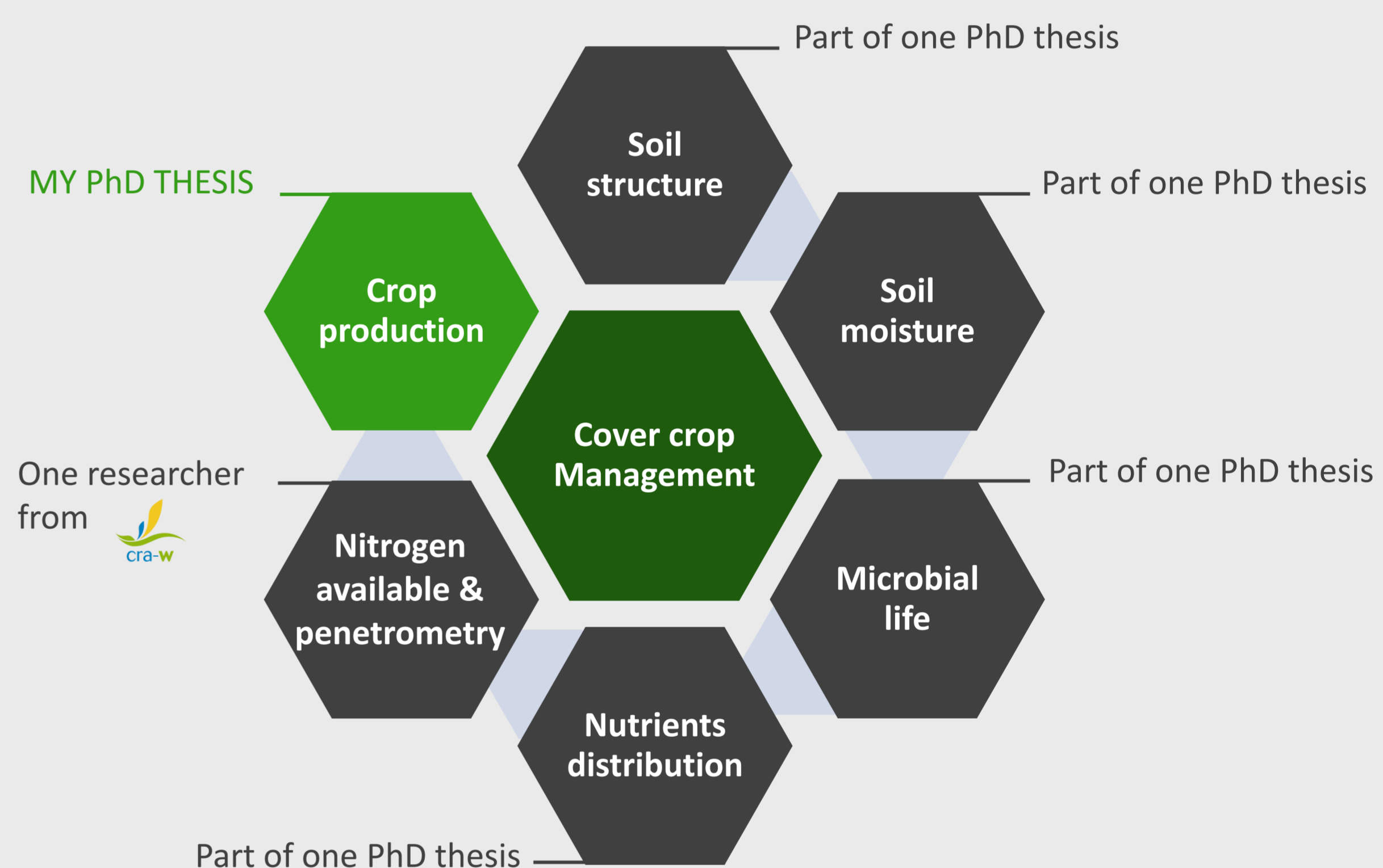
Treatments

Four contrasted cover crop managements were chosen. These modalities variations are related to the intensity of tillage, the cover crop destruction mode, main crop soil preparation and time of intervention. Some of them are classically used by farmers (1 and 2) other are less used (3) or quite new (4).



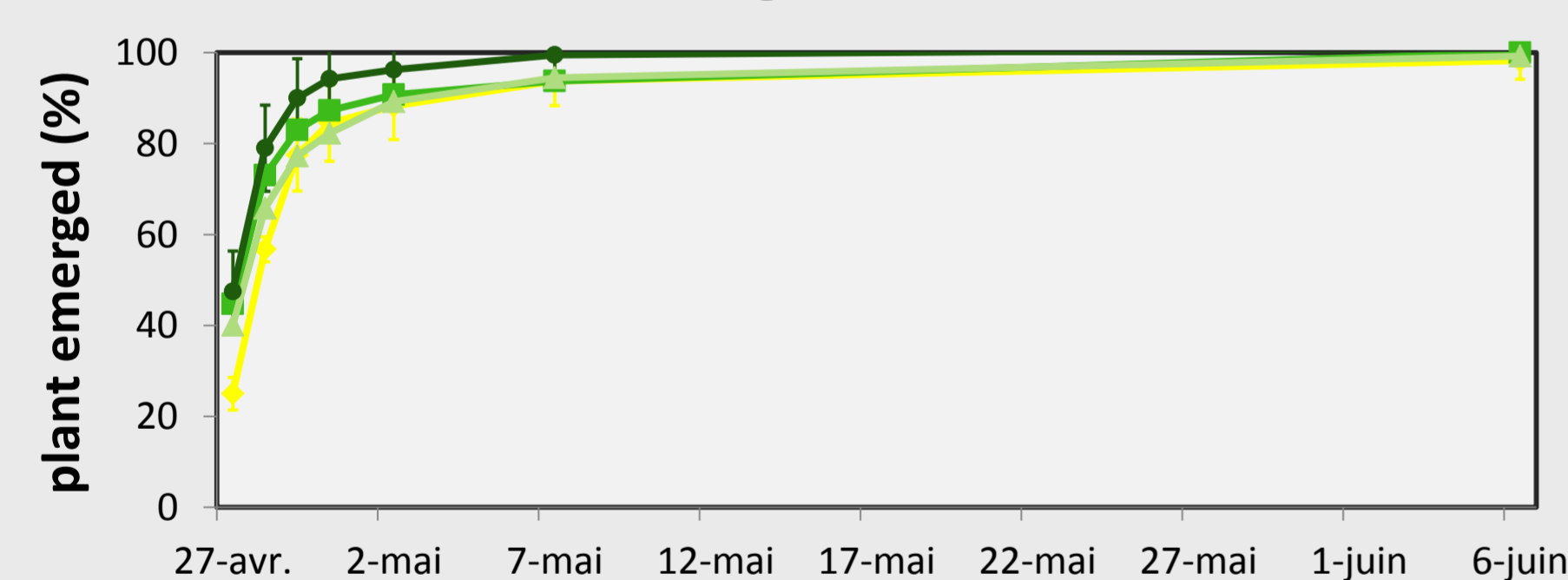
OBJECTIVES

Our goal is to understand how cover crop management, in Wallonia context, impacts crop production and weed population. This is a part of a bigger project that aims to characterize all the agroecosystem. This study will be linked with several other research inside the platform AgricultureIsLife.be

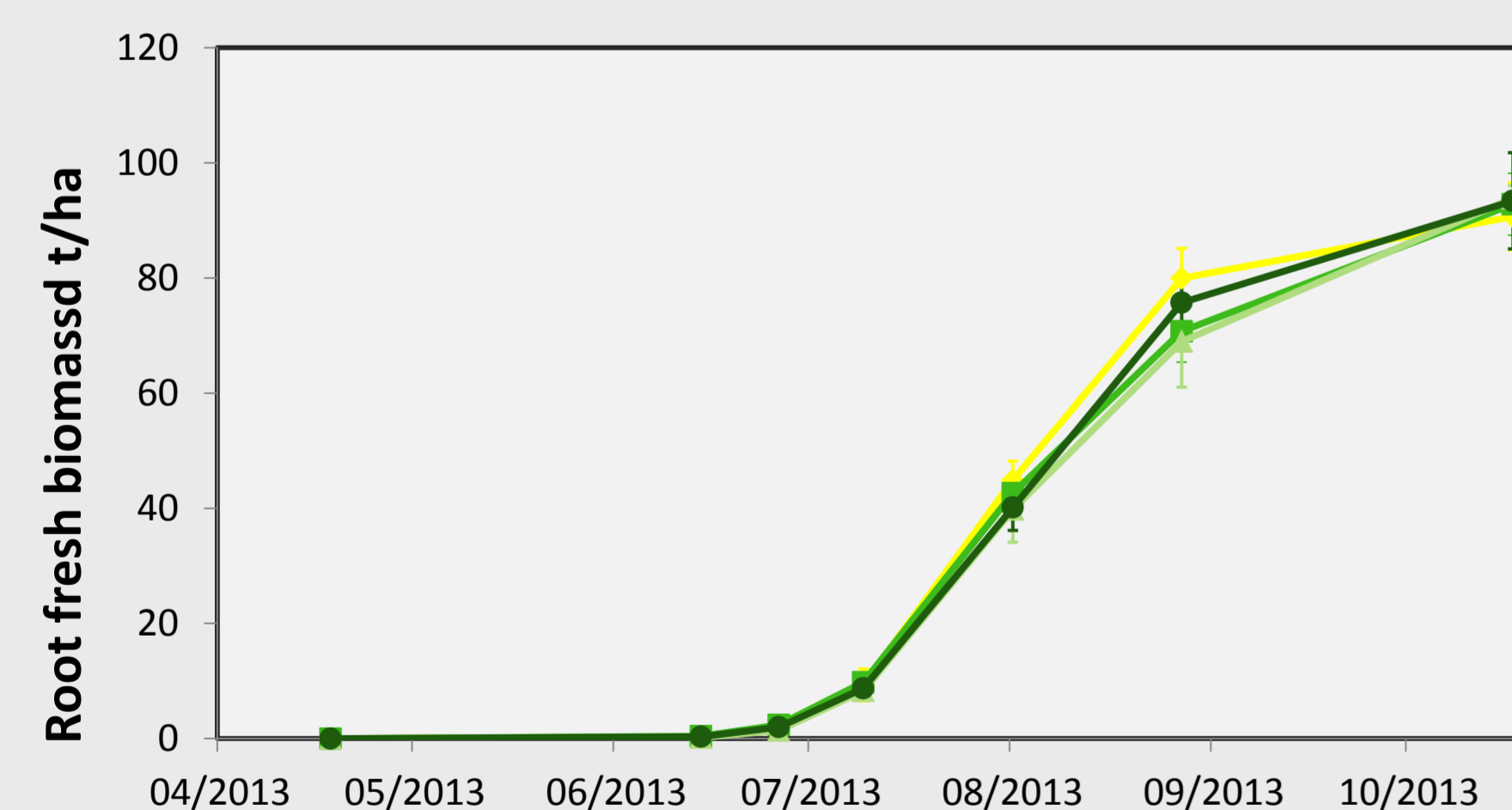


PRELIMINARY RESULTS

Main crop : Sugar beet

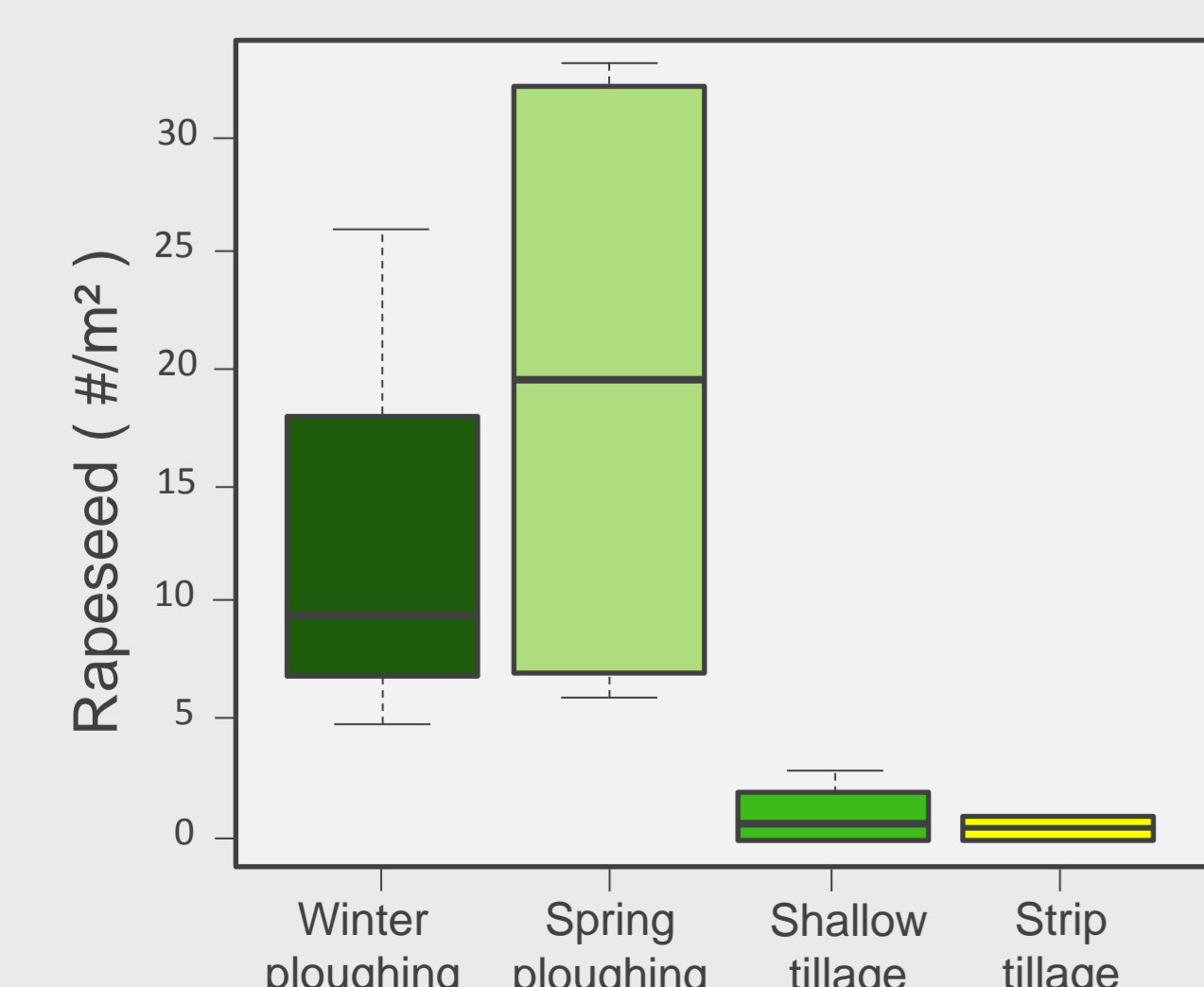


Germination rate was the same in each treatment. However we observed differences in germination dynamic with a faster germination in winter ploughed plots and the slower germination in strip tilled plots.



Concerning **crop development**, differences were observed with better results in shallow tillage for the beginning then the trend reversed with better results in winter ploughing and strip till. Finally the different treatments didn't have any effect on **crop production** quality and quantity included.

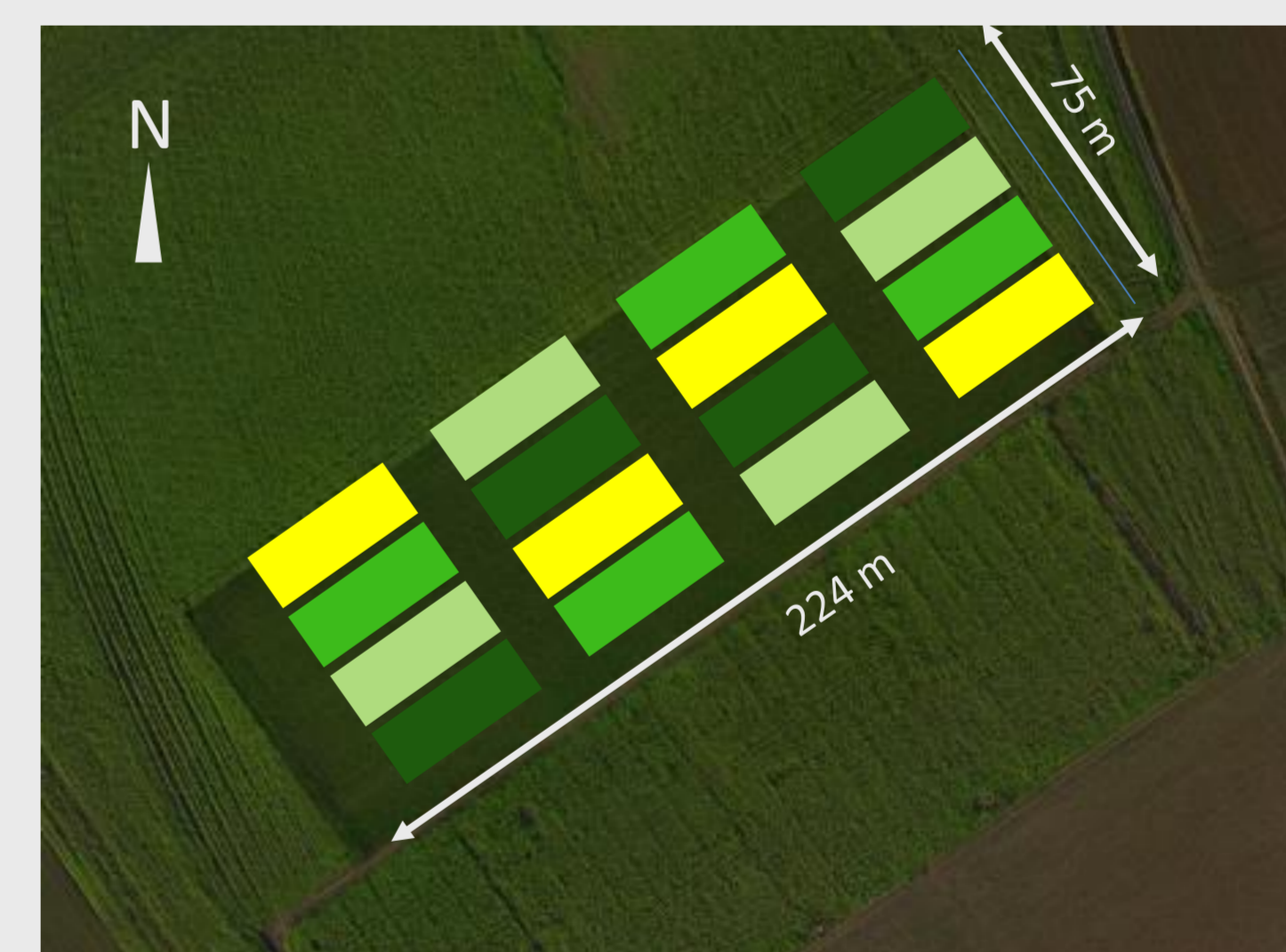
Weeds



Weed populations were followed during the whole cropping period. No significant differences were observed between the species or occurrence except in rapeseed. The occurrence of **rapeseed** at cotyledons stage in ploughing soil is significantly higher than in non ploughed soils. This is due to the presence of rapeseed crop four years ago. This occurrence didn't threaten the sugar beet crop because the field has been weeded by herbicide treatments.

EXPERIMENTAL DESIGN

The experimental field is situated near Gembloux in the loamy region at +50° 33' 50.18", +4° 42' 45.42". The field with a surface of 1,7 ha, has a latin square design. Each of the 16 plots have a surface of 15 m x 40 m.



CONCLUSION

As a field experiment is highly dependant on weather conditions, and as the processus in soils will take time to show differences, we still need to continue this experiment to observe crop behaviour along time and under various weather conditions.

This results concern only crop production and weed population but on this project, we collaborate with different PhD's student with differents skills (hydrology, microbiology,...). In this context we aim at characterizing the entire soil-water-plant system.