

Diversity of farming practices: the great overlooked

Analysis of the Diversity of Conservation Agriculture Types in the Walloon Region, Belgium

1. Context

Conservation Agriculture (CA) constitutes an agricultural system based on three pillars: the reduction of soil working, the maximization of organic soil cover, and the diversification of cultivated species. Three major challenges arise:

- 1) The definition of CA lacks precision and is difficult to apply in the field;
- 2) This flexibility results in a diversity of CA types that are currently underexplored;
- 3) The diversity of practices likely leads to a variety of outcomes, and consequently, potential benefits attributed to CA.

2. Goals

The thesis relies on four main objectives:

- 1) Develop and propose an operational definition of CA;
- 2) Propose a method for categorizing the diversity of CA practices in a given territory;
- 3) Evaluate the impact of different CA-types on soil quality;
- 4) Analyze and compare the transition processes as well as the trajectories of CA-types.

3. Brief description of chapters

3.1. A universal and operational definition of CA

In this chapter, we propose a universally applicable definition of CA. To achieve this, we analyze the convergences and divergences among existing definitions by examining two sources: FAO publications and research articles considered as references on CA.

3.2. CA in Wallonia

This chapter outlines the CA landscape in Wallonia, based on current knowledge and information gathered from various stakeholders and Walloon CA farmers. The chapter presents the extent of CA adoption, its geographical distribution, the integration of organic certification and livestock farming, and updates the mapping of key stakeholders

3.3. Categorizing CA practices

This chapter presents a new classification method for categorizing CA practices within a specific region. Our approach involves the intersection of results derived from an archetypal analysis and a hierarchical classification. The intersection of these two methods enables us to

identify both the most atypical CA practices, and intermediate CA-types. In Wallonia, five CA-types were identified.

3.4. Soil quality assessment of CA-types

Given that the impact of CA on soil quality is conditioned by the practices implemented, this chapter is devoted to a comparative analysis of the impact of different CA-types on soil quality. This analysis is based on a sampling of 28 CA plots spread across Wallonia.

3.5. Analysis of CA transition processes

This chapter explores farmers' motivations for adopting CA practices to determine whether these incentives vary according to the CA-type implemented. In addition, we analyze the stability of current practices, and farmers' future plans to evolve or not their practices, shaping future Walloon CA types. This knowledge is derived from 34 semi-structured interviews.