

## Chapter 15

# Conservation Agriculture in Europe

G. Basch, T. Friedrich, A. Kassam and E. Gonzalez-Sanchez

**Abstract** This chapter provides a description of the past and recent development of conservation agriculture (CA) in Europe. It reviews scientific and technical literature as well as empirical evidence reported by the European Conservation Agriculture Federation (ECAAF) and its national member associations.

Starting from the early beginnings of CA in Europe, this chapter reviews the development of CA until its current status. This clearly indicates that Europe lags far behind other regions in the world in terms of the adoption and spread of CA. This chapter presents actual data of adoption in several European countries as far as it is reported by national CA associations. It also reviews the most relevant experiences gained throughout Europe, focussing on crop performance, impact on soil quality, and weed, insects and disease incidence, as well as environmental and economic aspects of CA. Challenges and possible reasons for the relatively low uptake of CA in Europe are discussed, including the influence of national and European agricultural policies and regulations on the past evolution of CA uptake in Europe. Finally, this chapter provides an outlook into future prospects for up-scaling of CA in Europe, and what the likely impact of global changes and constraints may mean for the adoption and spread of CA in Europe.

**Keywords** Aggregate stability • Biodiversity • Common Agricultural Policy • European Conservation Agriculture Federation • Weed management

---

G. Basch (✉)

Institute of Mediterranean Agricultural and Environmental Sciences, University of Évora,  
P-7002-554 ÉVORA, Portugal  
e-mail: gb@uevora.pt

T. Friedrich

Plant Production and Protection Division, Food and Agriculture Organization, Rome, Italy

A. Kassam

School of Agriculture, Policy and Development, University of Reading, Reading RG6 6AR, UK

E. Gonzalez-Sanchez

Rural Engineering Department, University of Córdoba, Córdoba, Spain

## 15.1 Introduction

Conservation agriculture (CA) is a relatively recent concept which has its origins in soil and water conservation systems, which were developed in the 1940s and 1950s in response to the dust bowls in the USA that became known as conservation tillage. Since the middle of the twentieth century, both the need for soil and water conservation due to the intensification of agricultural land use and technological advances led to an increased demand and interest in conservation tillage systems and the gradual replacement of conventional plough tillage, which for many centuries, was the most effective way to guarantee satisfactory weed control, nutrient mineralization and seedbed preparation.

This chapter reviews developments in the science and practice of CA in Europe over the last few decades beginning in the late 1960s. It reviews reported information from several European countries, most of which have national associations dedicated to the promotion of CA and are members of the European Conservation Agriculture Federation (ECAAF).

Today, compared to other regions, Europe is lagging behind in terms of the adoption of CA. Only the African continent with about 1 million ha under CA—corresponding to 1 % of the global arable land—has a lower relative uptake when compared to Europe's approximately 1.36 million ha (not including Russia) under CA, which corresponds to approximately 2 % of the global arable cropland. These rates of uptake of CA lag far behind other regions in the world. For example, countries and regions such as USA, Canada, Paraguay and western Australia show adoption rates of 15, 30, 79 and 100 %, respectively (Friedrich et al. 2014).

Based on the history of CA in Europe, this chapter provides a sketch of the present state of CA and reviews experiences that may or may not help to explain the reason for the low adoption of CA in Europe in general and why adoption is much higher in some countries than in others. Challenges and opportunities are analysed in the light of both research findings and farmer experiences as well as under the economic and political conditions within the Common Agricultural Policy (CAP) framework.

## 15.2 History of CA in Europe

The initial adoption of conservation tillage was driven by different motives in different regions of the world where these techniques are widely applied today. In the USA, it was mainly the concern for the degradation of highly erodible prairie soils subject to both wind and water erosion due to intensive mechanical soil disturbance. Soon, the economic benefits of reduced and no-tillage crop production systems became as relevant as the concern for soil conservation, leading to the massive adhesion of farmers to the new technology for crop establishment and grassland renovation. Despite the occurrence of severe soil erosion in many parts of Brazil, it was