

PREFACE

The initiative of organizing a new debate on *conservation tillage* reveals the updating of this theme with a high impact on agricultural technologies.

The conceiving of *conservation tillage* was determined by the tillage practices which proved to be aggressive towards soil, first of all by favouring the erosion phenomenon. Such system has evolved in time under different methods consisting of the reduction of soil tillage and leaving crop residue (mulch) on soil surface for its protection.

The promotion of methods of reduced tillage, including no-tillage, was facilitated by herbicides use for weed control and by an economic result which was preferred by farmers, because it brings a fuel save, which means a profitable advantage.

In the world, no-tillage system is carried out on almost 100 million hectares, of which 80% on the American continent. The extension of no-tillage method in the practical activity takes place on the large farms which have acquired the equipment specific for the direct planting, appreciated by farmers owing to the reduced production costs.

At the beginning, the reduction of soil tillage aimed the decrease in the number of tillage trips over a field, a method described as *minimum tillage*, the term which has changed later (1977) into *conservation tillage*, defined as a form of non-inversion tillage, that retains protective amounts of residue mulch on the surface throughout the year (Uri, 1999).

The conservation tillage is an expression of a new concept – *conservation agriculture*, having as basic elements: little or no soil disturbance, no burning, crop rotation, permanent soil cover and controlled traffic to avoid soil compaction.

Conservation tillage has extended in the USA as a necessity for soil protection, this system covering at present over 40% from the cropland with large differences among states. The variation to carry out conservation tillage is determined by soil and climatic conditions and by farmers' availability and their ability to implement such system.

Conservation tillage promotion was sustained by the results of the research activity, developed in numerous centers, which offered a large volume of useful information for farmers. This research approached many aspects regarding the effects of practiced conservation tillage in comparison with conventional tillage, the results obtained being sometimes contradictory. There were studied problems referring to: the modification of soil physical and biological features, the hydric and thermic regime in soil, water movement in soil, plants emergence and their growing, weeds infestation, carbon sequestration, diseases and pests, the yields level, fuel consumption, production costs. Generally, the results are favourable for conservation tillage.

In our country, the decrease of soil disturbance was experimented and extended into the practical activity by reducing the depth of plowing or its replacement either by disking (a shallow work) or by a loosening without furrow turning, taking into consideration the crop requirements.

In the '60s, the first experiments were carried out with no-tillage for wheat and corn, obtaining good results, but with some difficulties generated by perennial weed infestation.

In the '80s, the research in the experimental fields extended to the large production farms (Urleasca-Brăila, Apahida-Cluj), which confirmed the practicability of the reduced tillage system, including no-tillage, with an economic profitability.

At present, no-tillage system is extending on large areas with good results. But we must not forget that the reduced tillage requires more skill, knowledge and care for conducting the technical processes in the crop production.

Consequently, the new results of research in the field of tillage conservation included into the present volume represent a precious contribution to the development of knowledge. We are interested to know more about the undesired consequences, which can appear in connection with the evolution of weeds infestation, the impact of climate changes, a potential attack of pathogens and pests, changes taking place in soil, suitability of cultivars to tillage conservation etc.

In such way the research activity has a large area of acting, its results being useful to the farmers who must know that any new technology involves not only advantages but also risks, which can be decreased or avoided only by help of rigorous research.

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