
UNIVERSITATEA DE TIINTE AGRICOLE I MEDICIN VETERINAR DIN
CLUJ-NAPOCA
COALA DOCTORAL DE TIINTE AGRICOLE INGINEREȘTI

TEZ DE ABILITARE

Cercetări interdisciplinare privind producerea și calitatea legumelor și a altor produse horticole

Domeniul: **Horticultură**

Autor: **Sima Rodica Maria**

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ABSTRACT

The habilitation thesis titled INTERDISCIPLINARY RESEARCH ON PRODUCTION OF VEGETABLES AND QUALITY OF VEGETABLES AND OTHER HORTICULTURAL PRODUCTS was written following the requirements of both the national legislation and the regulations regarding the habilitation procedures of the IOSUD of USAMV Cluj-Napoca, approved for the year 2017.

This habilitation thesis presents, in a summarized and documented manner, the research activity in field of Horticulture which I have conducted since my PhD graduation in 2003, in the field of Horticulture, as well as significant results that I have obtained with the view of this scientific and professional approach. The content of the habilitation thesis has been structured as follows: an abstract written in both Romanian and English; a first section which presents the main disciplinary and interdisciplinary research topics as well as the results and the scientific and professional achievements obtained in my research activity in the frame of different research teams, as director/member; a second section which presents the evolution of my professional, scientific and academic career; bibliographical references.

The main disciplinary and interdisciplinary research topics aimed at assessing the following themes:

- the management of some technological inputs at the vegetables production in protected crops and different cropping systems;
- the quality of vegetables and other horticultural products;
- the impact and the importance of agrobiodiversity and bio-conservation in the production of vegetables.

The research themes had both disciplinary, in the Vegetables growing field, and interdisciplinary character, approach which supposed collaboration with colleagues and specialists in the fields of Agro chemistry, Ecology, Biochemistry and Horticultural products technology of UASVM Cluj-Napoca and other universities (UASVM Bucharest, Universities of Craiova and Pitești), as well as within some research institutes in horticultural field (National Research and Development Institute for Biotechnology in Horticulture – Institutul Național de Cercetare Științifică și Dezvoltare în Horticultură). The relevance and the importance of research conducted within the topics above mentioned are highlighted, as appropriate, both by how they relate to the scientific achievements at the time of research and by the possibility and impact of transposing the results of the research into the practice. The results presented for each research topic are documented by results relevant to the research gathered within it, selected and synthesized from the articles that have been

published in various scientific bulletins and journals, international indexed/ISI rated, which are mentioned in the list of papers I have published.

In the first research topic regarding *the management of some technological inputs at the vegetables production in protected crops and different cropping systems*, I approached topical issues in national and international vegetable research, which aimed at the sustainable use of soil resources by establishing crop technologies that would allow the getting of high yields to ensure the profitability of these protected spaces and high quality products, in compliance with the rules of food safety. Thus, these research involved important vegetable species both as cultivated surface and as consumption requirement (tomato, cucumbers, bell peppers, eggplants and cabbage), cultivated in greenhouses and plastic tunnels, in different cropping systems (conventional and on organic substrate) under the influence of technological inputs of major influence on the obtained yields and their quality (substrate, cultivar, plants density, fertilization and pruning method).

Considering that nutritive value represents a useful approach in selection of cultivars with better health-promoting properties, within the second research topic which aimed *the quality of vegetables and other horticultural products*, were presented the results of research on the chemical composition and antioxidant compounds content in the fruit of some tomato cultivars and on the evaluation of some quality parameters considered important for small fruit cucumber cultivars, recommended for canning industry. Research experiments on the quality of vegetable products under the influence of technological factors have also been presented at lettuce and white cabbage.

In the research topic regarding *the quality of vegetables and other horticultural products* were also presented the results of interdisciplinary research regarding the possibilities of preservation of floral species such as roses and chrysanthemums (indigenous and/or imported cultivars) as cut flowers in different preservative solutions by appreciating the aesthetic and morphological changes that were highlighted in the floral bud, in the aspect of flower/inflorescence and in the aspect of the leaf from floral stem. One of the last addressed subject within this research topic aimed to evaluate five apple cultivars at the processing as clear juice and at the preservation by using of three methods (sulfur dioxide, sodium benzoate and pasteurization).

The third research topic outlined in the scientific work portfolio focused on research activities into the *importance and impact of agrobiodiversity and bio-conservation in the production of vegetables*. This orientation was the result of a trans-disciplinary collaboration within a project, in which I was involved with, as member of the research team with responsibilities in the field of vegetables growing. The project aimed at highlighting local varieties of carrot, parsley, lettuce and tomatoes with valuable agronomic and organoleptic characteristics

and resistance to biotic and abiotic stress, as well as at the selection and promotion of the most valuable local varieties (populations) of vegetables recommended for organic farming.

Studies on tomatoes have been developed by the research activities carried out with the support and collaboration of the Vegetables growing Department team, within a doctoral study program, which focused on the study of local tomato populations cultivated under plastic tunnel conditions. Research has started from the premise that the wide genetic variability of local varieties of tomatoes – the agrobiodiversity of the species, associated with their superior organoleptic and nutritional qualities as compared with the hybrids from conventional commercial crops, with their higher resistance to disease and pests, and with their better adaptability and possibility of capitalizing ecopedological conditions in a certain area of the country, can represent the starting point for the development and implementation of an ecological cropping system. This system responds to the both qualitative requirements of consumers and to the requirements of producers in terms of practicing a sustainable cropping system, especially regarding to the precocity of harvest and season extension of ecological production through plastic tunnel cultivation.

The evolution of professional, scientific and academic career and the main future development plans are presented in the third part of the thesis. In the research activity I coordinated 2 research grants as project director and I participated in 11 national grants as member of the research teams. The results of the research activity conducted to the publication of 156 articles, out of which 14 in ISI indexed/rated journals, 67 articles BDI and 47 in national and international proceedings with program committees. For teaching purpose I have published as sole/first/co-author 2 books, 6 chapters in books, 2 courses and 1 practical guide.

The results obtained in the presented research activity contributed to my professional and scientific completion through accumulation professional experience within activities such as the coordination of some research teams, as a project manager, respectively in activities of communication and collaboration with the members of the grant research teams, within I have activated in. All these accumulations have served as good practices and have given me a better ability to organize and manage the teaching activities I have been involved in. At the same time, the results of the research have allowed me to facilitate the learning process of students by creating knowledge based on the results of the inter- and trans-disciplinary research that I have undertaken.