

## ABSTRACT

The habilitation thesis titled “**Research on Cultivation Technologies for Agriculturally Significant Species in the Context of Climate Change**” synthesizes my professional achievements and research activities in the field of agronomy, conducted from the completion of my doctoral thesis in November 2009 to the present. Obtaining habilitation is a crucial step in the development of an academic and scientific career, with the primary goal of identifying, supporting, and mentoring young researchers passionate about scientific inquiry. This process not only validates academic and scientific competencies but also opens new perspectives for interdisciplinary collaborations.

This work provides a detailed analysis of academic, scientific, and professional activities, focusing on contributions to sustainable agriculture and the study of cultivated plants in the context of climate change. The structure of the thesis is organized into three main parts: Academic and Scientific Activities, Scientific and Professional Achievements, and the Career Development Plan.

The first chapter includes information about my professional training and experience in teaching and research. It highlights the role of education and research in career development and emphasizes significant contributions to the training of new generations of specialists.

The second part presents the scientific achievements, addressing the importance of climate change on agriculture in general and on cultivated plants in particular. This section discusses the main cereal crops, such as corn and wheat, in the context of climate change, as well as sorghum, a crop that can replace corn in more arid areas. Furthermore, it examines sustainable agricultural practices for oleaginous and proteaginous crops, which are fundamental components of sustainable agriculture, significantly contributing to the improvement of agricultural ecosystems, food security, and the reduction of ecological impact. Integrating these crops into modern agricultural practices can transform agriculture into a more sustainable and adaptable model for current challenges.

In addition, the thesis presents innovative technological elements applied to root and tuber crops such as potatoes, sugar beets, and sweet potatoes, which play a crucial role in global food security, nutrition, and economy. Studies on medicinal and aromatic plants are also featured, including agastache (*Agastache foeniculum*), artichoke (*Cynara scolymus*), chrysanthemum (*Chrysanthemum cinerariifolium*), St. John's Wort (*Hypericum perforatum*), sage (*Salvia officinalis*), lavender (*Lavandula angustifolia*), peppermint (*Mentha piperita*), and primula (*Primula veris*). Moreover, research on agricultural crops with medicinal uses, such as corn (*Zea mays*), barley (*Hordeum vulgare*), rapeseed (*Brassica napus*), and lupine (*Lupinus spp.*), highlights their dual utility in agriculture and phytotherapy. This chapter concludes with additional achievements in related fields.

The final chapter outlines strategic directions for the development of the university

career, including plans to strengthen teaching activities and expand scientific research.

From an academic perspective, the need for continuous improvement of teaching methods is emphasized to better meet current demands and help students acquire relevant skills and competencies. Special attention is given to adapting teaching practices to new educational trends, using interactive and innovative methods to make learning more engaging and effective. Another essential aspect involves the development and updating of teaching materials. The importance of creating educational resources aligned with the current themes of taught disciplines, labor market requirements, and student interests is underlined. Reediting or creating new, attractive, and relevant materials is a priority.

In the field of scientific research, the focus is on continuing and diversifying existing research directions by actively involving doctoral students in relevant and applied projects. Initiatives include exploring new research areas, optimizing agricultural technologies, and promoting academic education by training new generations of specialists.

Strategies are also detailed for consolidating existing collaborations and establishing new partnerships with research teams from national and international institutions. These partnerships are considered essential for increasing the quality and impact of the research conducted.

To enhance the impact of research, emphasis is placed on increasing the international visibility of scientific activity. This involves not only publishing a greater number of scientific papers but also significantly improving their quality. Publications will target high-impact journals to ensure better dissemination of research results.

By pursuing these directions, this work provides a comprehensive and well-founded plan for the development of an academic career, reflecting a strong commitment to academic excellence, applied research, and the training of future specialists capable of addressing current challenges in agriculture and science.