“Crop Diversification in Controlled Environment Agriculture”
Scientific Training Plan

Research Objectives

The Research Centre on Urban Agriculture and Biodiversity (ResCUE-AB), Department of Agricultural and Food Sciences (DISTAL), University of Bologna, has extensive experience in the development of innovative cultivation systems for Controlled Environment Agriculture (CEA), with particular emphasis on urban agriculture, soilless cultivation, and vertical farming. Through its participation in national and international research initiatives, the research group develops sustainable production strategies aimed at improving resource-use efficiency, enhancing crop performance, and promoting the diversification of horticultural crops grown under controlled environmental conditions. The objective of this research activity is to provide advanced scientific training in the experimental evaluation and optimization of cultivation protocols for diversified horticultural crops cultivated in vertical farming systems. The research will focus on investigating the effects of environmental and agronomic factors—including artificial lighting, nutrient management, and cultivation practices—on plant growth, productivity, resource-use efficiency, and crop quality. The research activities will be carried out at the experimental facilities of the Department of Agricultural and Food Sciences (DISTAL), University of Bologna, and will include:

- Design and management of experiments involving horticultural crops cultivated in vertical farming and soilless production systems;
- Optimization of cultivation protocols through the management of environmental and nutritional conditions;
- Evaluation of plant growth, yield, resource-use efficiency, and quality-related parameters;
- Collection, statistical analysis, and interpretation of experimental data;
- Support for research activities in Controlled Environment Agriculture and crop diversification;
- Contribution to the preparation of technical reports, scientific publications, and dissemination activities.

Planned Activities

The research activities will focus on the cultivation and experimental evaluation of diversified horticultural crops grown in vertical farming and soilless cultivation systems. The candidate will participate in the planning, management, and execution of experiments aimed at optimizing cultivation protocols and evaluating the effects of environmental and agronomic factors on crop growth, productivity, resource-use efficiency, and quality.

Through these activities, the candidate will acquire practical knowledge of controlled environment agriculture, including vertical farming, cultivation of diversified crops, experimental design, data collection, statistical analysis, and interpretation of research results.

The candidate is expected to have a solid background in agronomy, horticulture, plant physiology, or related disciplines. Previous experience in horticultural experimentation, controlled environment agriculture, soilless cultivation, or statistical analysis of experimental data will be

considered an advantage. Good English proficiency, together with strong organizational, teamwork, and problem-solving skills, is also required.

Research Location

The research activities will be carried out at the Alma Vertical Farm (AlmaVFARM) and the experimental greenhouses of the Department of Agricultural and Food Sciences (DISTAL), University of Bologna.