

PLANT SCIENCE, PLANT GROWING AND HORTICULTURE

Biotechnology

- Detecting the molecular resistance of pesticides
- Markers, detecting genes, selection based on markers
- Research of the molecular genetics of rag weeds and other weeds
- Detection of pollen allergic genes, the evaluation of their frequency in natural population
- The demonstration of genetic variability at molecular level
- Mapping of genes that determine economically significant characteristics
- Research of fish and insect genetics

Genetics and Plant Breeding

- The examination of the nutrient utilization ability of plant species
- The examination of abiotic stress tolerance (e.g. drought tolerance)
- Analyses to isolate resistance genes
- The application of molecular markers in species research
- Developments of potato genomes, resistance breeding
- The evaluation of the bio-ethics of gene technology
- Breeding of horticultural and arable plants (grass plants, green peppers, grapes)

Microbiology

- Soil microbiology, research into organic and artificial fertilization, examinations of soil biology
- The ecology of microbial soil
- Soil enzymology

Botany and Plant Physiology

- Revealing the problems of nature, environmental protection and landscape management
- Preparation of surveys, research into nature protection
- Vegetation and habitat mapping, floristic research
- Ethno-ecological studies
- The examination of hormone products and plant conditioners
- Mycology research, to grow wild mushrooms
- The sustainability of endangered species, research into the conditions of protection in cooperation with national institutions (gene bank, Tápíószele, botanic gardens)

Crop Production

- Relationships between nutrient supply and crop production
 - Comparative studies on the effects of organic and mineral fertilization on soil fertility, yield quantity and quality
 - Investigation of the interaction of crop rotation, fertilization and meteorological data
 - Studying the dynamics of organic matter and Nitrogen in the soil and the effectiveness of Nitrogen supply
- Investigation of new plant species and genotypes

- The examination of the parameters of wheat in the mill and bakery industry
- Maintaining of varieties: conservation selection of grass species
- Experiments with energy plants
 - The examination of arable crops as raw materials for biogas, biodiesel, bio ethanol production

Land Use

- The development of a new land qualification and evaluation system
- Long term experiments in crop rotation and maize monoculture
- The examination of the connection between the systems of rotation, cultivation fertilization and soil productivity in arable land research
- Coordination of the network of National NPK Fertilization Long-term Field Experiment at Keszthely (OMTK).
- Participation in the development of crop and site-specific nutrient management system

Soil Science and Agrochemistry

- Research in soil physical methodology (water permeability, oil retention ability, air permeability, hydraulic conductance)
- The development of the national soil physical database (MARTHA)
- Studies on the effects of nutrient load using models of material cycles, erosion experiments at different scales.
- Developments in soil mapping, environmental impact and risk assessments (using electronic databases and different geostatistical methods)
- Studies of the nutrient dynamics in the soil-plant system under greenhouse and incubation experiments
- Investigations of plant nutrient element contents and plant available forms of soil nutrients using different methodologies.
- Studies of the relationships between plant and soil nutrient concentrations (available forms of N,P and K).
- Studying the effects of nitrogen, phosphorus and potassium nutrient imbalances and stress under controlled environments

Horticulture

- The development of the vegetative propagation of horticultural plants and in vitro maintenance of fruit species
- The development of production technologies in the entire range of horticulture
- The examination of the drought and frost resistance of ornamental trees and bushes, the comparison of different irrigation methods in horticultural cultures
- Comparative examinations of species in vegetable production
- Examinations of blooming biology for coupling of species with fruit growing plants

- The examination of growing different arboreal and non-arboreal ornamental plants in different medium and ways of nutrition
- Extreme weather conditions and the protection against them in orchards
- The identification of grape species according to the indicators of ampelography
- The examination of nutrient supply and plant protection of vineyards
- Grape breeding
- Winery research – methods of processing grapes, white wine maturing technologies

Potato Research

- Maintenance and development of the biological basis of potato production
- Genetic and biotechnological studies for the development understanding the nature and heritability of resistances against major potato pests (viruses, bacteria, fungi, nematodes)
- Variety breeding programme; quality, pathology and genetic research to assist in breeding
- Research in connection to the maintenance and propagation of our own varieties
- Development of general and variety specific production technologies (agro-techniques, plant nutrition, plant production, etc.)