SECTORAL OPERATIONAL PROGRAM
"INCREASE OF ECONOMIC COMPETITIVENESS"
funded by The European Regional Development Fund and National Budget
„Investment in your future "

Beneficiary: University of Agronomic Sciences and Veterinary Medicine in Bucharest

Research Center for Studies of Food and Agricultural Products Quality

Strategic goal of UASMV Bucharest is to become **a reference center in the study of quality food products**

Agriculture and food industry with their specific products activities - research or production - have a significant impact on life quality (through agricultural products and their implications on health and environment).

Research Center for Studies of Food Quality and Agricultural Products from UASVM Bucharest is the newest developed research infrastructure

This research center emerged to ensure a good quality control of agricultural and food products throughout the production flow, to promote the biodiversity and environmental protection, as well as a higher quality of food products for consumer needs and expectations.

Laboratories:

Laboratory of integrated fruit growing

Research topics: The study of the tree as a complex productive system; the study of the integrate fruit growing plantation as an enduring ecosistem; the research of new varieties and mother plants suitable for low environmental impact fruit growing; research of the means of optimization of culture technologies in integrated fruit growing plantations; the study of the relationships between plant and environment through a climate change point of view.

Equipments: penetrometer , portable refractometer, system for leaf image analysis, system for root multiple image analysis, digital image analyzer for canopy structure, machine for chopping grass and branches, orchard milling machine with feeler, trailed orchard sprayer

Laboratory of molecular virology

Research activities: extraction of ADN, ARN genetic material, sequencing activities, asisted selection using molecular markers; hibridations, amplification of genetic material, detection of a variety of plant viruses.This laboratory proposed the following immediate research topic: The mass selection of plum and apricot tree using molecular markers, specific environmental monitoring and protection.

Equipments: PCR Termobloc Mastercycler NEXUS gradient Eppendorf, *automated nucleic acid extraction system* INNU PURE C16 ANALYTIK JENA, *vertical laminar flow hood microbiological, pH meter, incubator without cooling, precision technical balance* PARTNER PS2100R2, *drying oven, microscope with built camera, vertical electrophoresis, refrigerator, centrifuge, orbital shaker, horizontal electrophoresis, glassware washing machine*

Laboratory of plant multiplication

Research activities: the study of the main methods of plants propagation, the reduction of growth time for young plants, the obtaining of plant material that is free of viruses and pests. This laboratory proposed the following immediate research topic: The creation and implementation of new biotechnologycal techniques in plant propagation, the conservation of the biodiversity of plant species.

Equipments: Vertical laminar flow hood microbiological, pH meter, technical balance PARTNER PS2100R2, *drying oven, refrigerator, magnetic stirrer, climatic chamber, orbital shaker, autoclave, laboratory thermostatic water bath, magnetic stirrer with heating plate, washing machine, glassware washing machine, microscope, precision analytical balance* PARTNER AS200R2*, microwave oven*

Laboratory of diagnosis and plant protection

Research activities: diagnosis of diseases and pests of the samples, purity analysis of plant materials in terms of genetic content of genetically modified organisms, load analysis of pathogens and pests of plants and food. This laboratory aims as immediate research themes: food security and animal population, reducing the negative influence of plant protection measures, preservation of biodiversity agroecosystems by reducing the negative influence of plant protection measures, development of new technologies under the plant protection EU regulations.

Equipments: Climate chambers for the insect growth, vertical laminar flow hood microbiological, biological safety cabinet, bacteriological thermostat, stereomicroscope, automated nucleic acid extraction system INNU PURE C16 ANALYTIK JENA*, PCR termobloc* Mastercycler NEXUS gradient Eppendorf, *precision analytical balance, magnetic stirrer, laboratory thermostatic water bath, microscope with built camera, thermostat, digital video camera, drying oven*

Laboratory of post-harvest technologies

Research activities: the testing of storage capacity in different storage condition, the identifications of biological fighting techniques for storage pathogens, the testing of post-harvest treatments in order to improve storage capacity, primary physical and chemical analyses for agroalimentary products. This laboratory proposed the following immediate research topic: post-harverst non-polluting technologies for improving the storage capacity of agroalimentary products, the assessment of agroalimentary products quality through non-distructive techniques, activities for the prevention of frauds in the field of food products.

Equipments: pH meter, penetrometer, compact muffle furnaces, technical balance, refractometer, drying oven, digital photo cameras, analytical balance, cold room 1, cold room 2, controlled atmosphere equipment for 12 cabinets.

Laboratory of agrochemistry

Research activities: agrochemical analysis of plant, soil, substrate, fertilizers. This laboratory proposed the following immediate research topic: nitrate determination in water, soil and plant; trace metals determination in soil, specific environmental monitoring and protection.

Equipments: UV-VIS spectrophotometer, ion chromatograph Waters Alliance e2695 XE Separations Module w / CH with conductivity detector 432 Waters, and Anions Cations suppressors, with software EMPOWER*, thermobalance* PARTNER MAC50*, compact muffle furnaces, conductormeter-multiparameter, pH meter, magnetic stirrer with heating plate, refrigerator, centrifuge* Eppendorf*, thermostatic water bath, ultrapure water apparatus, soils mill, laboratory fume hood, fat extraction system, reflectometer for water analysis, mechanical shaker soil samples (homogenizer), automated titration system, drying oven, technical balance* PARTNER PS2100R2, *analytical balance* PARTNER AS200R2*.*

Laboratory of IT, management and econometry

Laboratory is designed to collection, storage and structuring data and information, its processing and recovery results. In this laboratory performs mathematical models for evaluating, funding and decision-making.

Equipments: computers Dell Optiplex 3010MT, laptop Dell Inspiron 5521, server Dell PowerEdge T620, Software: 5xMathcad Education – University Edition, IBM SPSS 21.0 Statistics Base Authorized User License, STATISTICA V12 Advanced for Windows.

Laboratory of sensorial analysis

Research themes: development of products – evaluation of new products using the methodology of sensory analysis; evaluation and comparison of new technologies for the processing of foodstuffs by sensory analysis of these products; evaluation of the quality of food products; activities for the prevention of frauds in the field of food products.

Equipments: GC-MS with comparison function like "nose-electronic" GC-MS Agilent 7890B - 5977A*, dishwasher, bidistilled water apparatus, software for sensorial analysis* FIZZ FORMS and FIZZ NETWORK.

Laboratory of microscopy and plant anatomy

Research activities: specifically plant's morphology and anatomy activities; optical, electronically and fluorescence microscopy. As research themes, the following immediately proposed subjects are: research regarding the wild flora species biodiversity to introduce in culture of the wild species with a decorative characteristics; morpho-structurally plants characteristics in the biotic and abiotic stress conditions.

Equipments: Scanning electron microscope SEM Inspect S50 FEI Company*, research trinocular microscope* Leica DM 1000 LED*, trinocular zoom stereomicroscope* Leica S8Apo*, tissue processing system for SEM (ultramicrotome* Leica EM UC7 RT and Leica E*M*W7P, Leica EM TRIM2, Leica EM KMR3*), research binocular microscope* Leica DM500*, precision rotary microtome* Leica RM2245*, embedding station* Leica EG1150H*, fluorescence microscope* Leica DM 3000*, technical balance* ADAM PGL2002

Laboratory of physico-chemical analysis

Research activities: Physical and chemical analysis based on gas chromatographic methods coupled with FID and MS detectors (to perform pesticides residues determination, volatiles components, amino acids, carbohydrates etc.), FT-IR spectrometry and lichid chromatography (vitamin C determination, carbohydrates etc.), ICP-MS spectrometry (mineral elements determination) for agro-alimentary product; the development of new analitical methods for the interested compounds. As a proposed research theme it can be mentioned: biodiversity –sustainable valorification and preservation; traceability of some components (minerals, pesticide residues, toxins etc.) during the production chain (soil-plant-crops-finite product), specific environmental monitoring and protection.

Equipments: ICP-MS Spectrometer Agilent 7700x with software Mass Hunter G7200B*, GC-MS with headspace and MS, FID detectors, centrifuge* MPW MED. Instruments*, microwave digestion system, drying oven, laboratory fume hood, system analysis of solid – liquid* FT-NIR Bruker MPA with software Bruker OPUS*, extraction system* ASE 350 Thermo Scientific*, sample concentrator with nitrogen flux*, *analytical balance* PARTNER AS200R2*, semi-analytical balance* PARTNER PS600 R2*, technical balance* PARTNER PS2100R2*, refrigerator*

Laboratory of plant physiology

Research activities: specifically determination of the physiological processes rate (photosynthesis, transpiration, respiration) in vivo and in laboratory, osmotic potential determination, membrane permeability, concentration of some biochemical parameters determination. Reserch themes: biotic and abiotic stress for cultivated plants and wild species, biodiversity and the cultural technologies effects on the yield and productivity.

Equipments: Analyzer ADC Bioscientific Lcpro-SD *for photosynthesis, transpiration, respiration processes, autolaborator, infrared CO2 analyzer* ADC BioScientific Lambda-T*, automatic burette, UPLC system with FLR detector Acquity* UPLC I-CLASS Waters with software EMPOWER, *refractometer, ELISA Processing system* FLUOStar Omega BMG Labtech*, peristaltic pump, centrifuge* Eppendorf*, plant stress analyzing system* Opti-Sciences CCM-300, ACM-200plus and OS1p*, drying oven, laboratory freezer, lyophilizer, vibrated water bath, ultrasonic bath, bidistilled water apparatus, ultrapure water apparatus, ice machine, mill plant materials, automatic homogenizer, orbital shaker, sample concentrator with nitrogen flux, refrigerator, electronic balance , semi-analytical balance.*

Laboratory of molecular plant biology

Research activities: DNA extraction, DNA detection and quantification of genetically modified organisms, GMOs analysis by electrophoresis and imagistics, the development and improvement of new GMO analysis methods, special genomic analysis.

The proposed immediately research themes are: GMO impact on agro-alimentary products and health, GMO coexistence with genetically unmodified species, gene and gene products flux in the ecosystem and food chain, analysis of the agro-alimentary products which posibly contain GMO, activities for the prevention of frauds in the field of food products, specific environmental monitoring and protection.

Equipments: centrifuge Eppendorf, *spectrophotometer* Specord 210 Plus ANALYTIK JENA, Agilent 2100 Bioanalyser, *pH-meter, magnetic stirrer with heating plate, Western Blot system, ELISA plates reader, ELISA processing system, peristaltic pump, microcentrifuge, drying oven, laboratory freezer, PCR* MasterCycler ProS Eppendorf, *Real time PCR* LightCycler 480 System ROCHE, *vertical electrophoresis, orbital shaker, analytical balance* PARTNER AS200R2, *electronic portable balances* ADAM PGL 203, *refrigerator, block heater.*

Laboratory of molecular plant physiology

Research activities: Special genomic analysis, proteomics and metabolomics to study the functions and interactions at the molecular level in plants. The proposed immediately research subjects are: structure-functions relations at the gene-protein-metabolite; agro-alimentary quality study based on QTL technique and possibility to select variants with an economical valuable quality.

Equipments: Functional system for proteomics-metabolomics analysis LCMS-QTOF Agilent 5990-6221EN with Chromatographic and Metabolic Pathway software 5989-4895EN, *Functional genomics platform (sequencing and microarray)* GS Junior ROCHE with NimbleGen MS200 Microarray Scanner and NimbleGen Hybridization Systems, *system analysis of protein interactions* ProteOn XPR36 Protein Interaction system BIORAD coupled with NGC Quest 10 Plus Chromatography Instrument, *centrifuge* Eppendorf, *automated nucleic acid extraction system* MagNa Pure LC 2.0 System ROCHE, *vertical laminar flow hood microbiological, drying oven, ELISA processing system, peristaltic pump, external laser molecular imaging system* Molecular Imager PharosFX Plus System BIORAD with PDQuest Advanced 2-D Analysis Software, *bidistilled water apparatus, ultrapure water apparatus, magnetic stirrer with heating plate, microcentrifuge* Eppendorf, *vibrated water bath, pH-meter, mill plant materials* SPEED MILL PLUS ANALYTIK JENA, *orbital shaker, block heater, analytical balance* PARTNER AS60/220 R2, *technical balance* PARTNER PS2100R2, *refrigerator, laboratory freezer box.*

The new ***RESEARCH GREENHOUSE*** was build and equipped with the most important facilities: heating systems, irrigation systems, culture tables or troughs, lamps for assimilation, water and energy management system, computer for monitoring and automation for research domain, specific software, etc. Aspersion, reflux and flooding installations and drip systems can all be operated via the water management program. The greenhouse is provided with a recirculation system of the wastewaters and of the unused nutritional solutions after LD-UV disinfection, in this way will contribute substantially to environmental protection.

Research activities: the monitoring of environmental factors such as air and soil temperature, humidity, CO_2 concentration, lighting, irrigation, etc. in order to develop specific culture technologies and the influence of horticultural plants action of environmental factors on physiological and biochemical processes of horticultural plants.

Research directions:

1. Corelation between the biotic and abiotic plant stress and the culture technologies productivity, with quality implications on food and plant products
2. Study the tree like complex production system and the orchard as a sustainable ecosystem
3. Study the crop products quality from structure-function relationship at molecular level (gene-protein-metabolites) in order to selection of variants with great economic value.
4. Biodiversity – sustainable utilization and conservation.

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