Agricultural Research, Education and Extension Organization

Internship Program for Uzbek Researchers- 2025

Agricultural Field	Educational Content	Duration	Center for Education/ Research	Coordinator
Agricultural Technology (Digitization of Agricultural Machinery and Improvement of Agricultural Metrology)	**Smart Agriculture**		Agricultural Engineering Research Institute (AERI), Karaj, Iran	Prof. Dr. Hossein Dehghanisanij Number: +98-912-1675238 Email: dehghanisanij@yahoo.com
	– Precision Agriculture	1 week		
	– Vis/NIR Spectroscopy and Imaging	1 week		
	– Internet of Things – Artificial Intelligence in Agriculture	1 week		
	– Field Visit	1 week		
Biotechnology in Agriculture (Development, Introduction and Transfer of Modern Plant Breeding Technologies & Introgression of Useful Genes from Wild Species to Commercial Cultivars)	– **Lectures** • Introduction to Genetic Engineering and Transgenic Plants • Methods of Plant Genetic Engineering • Genetic Engineering in Horticultural and Ornamental Plants • Genome Editing (CRISPR/Cas) in Plant Improvement • Biosafety and Risk Assessment of Transgenic Plants GMO Detection and Identification	1 week	Agricultural Biotechnology Research Institute of Iran (ABRII), Karaj, Iran.	Dr. Hassan Rahnama Number: +98-912-4615988 Email: hrahnama@abrii.ac.ir
	– **Case Studies** • Development of Herbicide Tolerant Transgenic Canola • Genetic Engineering for Improvement of Safflower Plant • Transgenic Cotton: Using Back-crossing for Introducing Desired Genes to Iranian Cultivars • Genome Editing (CRISPR/Cas) for Developing Herbicide Resistant Rice • Transgenic Potato Resistant to Potato Tuber Moth (PTM) (Development and Risk Assessment)	1 week		
	– **Lab** • Introduction to Plant Tissue Culture • Tissue culture and Plant Regeneration in *B. carinata* • Construction of Plasmid Vector (Preparation of Competent Cell, Plasmid Extraction, Gene Cloning, Gel Electrophoresis) • PCR Analysis (Primer Designing, and PCR Analysis) • Agrobacterium Mediated Genetic Transformation of *B. napus* • Agrobacterium Mediated Genetic Transformation of Soybean • Gene Gun Mediated Transformation of Plants • DNA and RNA Extraction from Plants • Molecular Analysis of Transgenic Plants (PCR, Real Time-PCR and ….) • Functional Analysis of Transgenic Plants (Bioassay, Protein expression, …) • GMO Detection in the Lab – **Final Projects** Participants Present Proposal on Genetic Engineering for Improving a Desired Trait in the Target Plant	1 week		

Biotechnology in Agriculture (Using Molecular Genetics and Biotechnology for Enhancing the Conservation and Utilization of Plant Genetic Resources)	– **Introduction to Molecular Markers and Genetic Diversity** • Lecture: Overview of plant genetic resources (PGR) and the role of molecular markers in conservation. • Lab: DNA extraction from plant samples (CTAB vs. commercial kits). • Lecture: Types of molecular markers (RAPD, SSR, SNP, AFLP) – pros and cons. • Lab: Quality check (gel electrophoresis, spectrophotometry). • Case Study: How molecular markers helped conserve crop wild relatives. • Workshop: Primer design for SSR markers (using Primer3, OligoCalc). • Group Activity: Design a genetic diversity study for a selected plant species.	1 week	Agricultural Biotechnology Research Institute of Iran (ABRII)	Dr. Mehrshad Zeinolabedini Number: +98-912-8112770 Email: m_zeinalabedini@yahoo.com
	– **PCR-Based Markers (SSR, RAPD, AFLP)** • Lab: PCR optimization for SSR markers (gradient PCR, annealing temp testing). • Lab: Gel electrophoresis and fragment analysis for SSR genotyping. • Lecture: Applications of RAPD and AFLP in genetic diversity studies. • Lab: RAPD fingerprinting (hands-on PCR and gel analysis). • Data Session: Scoring and interpreting RAPD/AFLP banding patterns. • Guest Speaker: Researcher using SSR markers for in-situ conservation.	1 week		
	– **SNP Markers and High-Throughput Genotyping** • Lecture: SNP markers – advantages over SSRs, applications in genomics. • Workshop: Analyzing SNP data (Plink, TASSEL). • Lecture: GWAS (Genome-Wide Association Study) for identifying stress-tolerant genes. • Group Project: Compare SSR vs. SNP data for a given dataset.	1 week		
	– **Data Analysis and Population Genetics** • Lecture: Genetic diversity indices (He, Ho, Fst, AMOVA). • Hands-on: Using GenAlEx for basic diversity stats. • Workshop: STRUCTURE analysis for population clustering. • Lab: Phylogenetic tree construction (MEGA, DARwin). • Case Study: How molecular markers guided breeding programs (e.g., disease resistance in potatoes). • Data Challenge: Interpret a real dataset from a conservation project.	1 week		

	– **Marker-Assisted Conservation Strategies** • Lecture: Using markers for seed bank management (genetic integrity monitoring). • Lab: Detecting genetic erosion in ex-situ collections. • Workshop: Designing a marker-assisted breeding scheme. • Guest Lecture: Policy implications (Nagoya Protocol, ITPGRFA). • Group Project: Develop a conservation plan using molecular data. – **Applications and Final Projects** • Final Project Work: Analyze a dataset and propose conservation actions. • Presentations: Teams present findings (e.g., genetic diversity report for a threatened species). • Panel Discussion: "From Lab to Field – Challenges in Implementing Marker-Based Conservation." • Certification & Networking: Course wrap-up, resource sharing, career pathways.	1 week		
Breeding and Seed Production (Enriching Knowledge on Marker Assisted Selection Technologies in Grain Crops and Genes Controlling the Traits of Resistance to the Abiotic Stress)	– **Foundations of MAS & Abiotic Stress in Grain Crops** • Lecture: Introduction to MAS – principles, advantages over conventional breeding. • Case Study: Success stories of MAS in rice/wheat breeding. • Lecture: Major abiotic stresses (drought, salinity, heat) and their impact on grain crops. • Lab: DNA extraction from grain crops (CTAB method vs. kits). • Workshop: Primer design for stress-related genes (using Primer-BLAST, OligoCalc). • Group Discussion: Identifying key traits for MAS in local grain crops. – **Molecular Markers for MAS** • Lecture: Types of markers (SSR, SNP, KASP) and their use in MAS. • Lab: PCR optimization for SSR markers (gradient PCR). • Lab: Gel electrophoresis & fragment analysis for SSR genotyping. • Demo: High-throughput SNP genotyping. • Data Session: Comparing marker systems for breeding efficiency.	1 week	Agricultural Biotechnology Research Institute of Iran (ABRII), Karaj, Iran.	Dr. Mehrshad Zeinolabedini Number: +98-912-8112770 Email: m_zeinalabedini@yahoo.com
	– **QTL Mapping & GWAS for Abiotic Stress Traits** • Lecture: QTL mapping – principles and applications in stress tolerance. • Workshop: Using QTL IciMapping for linkage analysis. • Lecture: Genome-Wide Association Studies (GWAS) for stress gene discovery. • Hands-on: GWAS analysis using TASSEL/GAPIT. • Case Study: Identifying drought-tolerant QTLs in maize/rice.	1 week		

	– **Gene Pyramiding & MAS Breeding Schemes** • Lecture: Gene pyramiding for multi-stress resistance. • Workshop: Designing MAS schemes for stacking stress genes. • Lab: Marker validation for gene pyramiding (multiplex PCR). • Case Study: IRRI's MAS breeding for salinity tolerance in rice. • Group Activity: Simulate a MAS breeding program for drought tolerance.	1 week		
	– **Functional Genomics of Abiotic Stress Genes** • Lecture: Key genes involved in stress response. • Lab: RNA extraction & cDNA synthesis for gene expression studies. • Workshop: qPCR analysis of stress-responsive genes. • Bioinformatics: Mining stress-related genes in NCBI, Gramene. • Guest Lecture: CRISPR-edited crops for abiotic stress tolerance. – **High-Throughput Phenotyping & MAS Integration** • Lecture: Phenomics tools (drones, sensors) for stress screening. • Demo: Infrared thermography for drought stress detection. • Workshop: Correlating phenotypic data with marker profiles. • Case Study: CIMMYT's MAS for heat tolerance in wheat. • Group Project: Design a MAS + phenotyping pipeline.	1 week		
	– **Bioinformatics for MAS & Stress Genomics** • Workshop: Genome browsers (Ensembl Plants, Phytozome) for gene discovery. • Hands-on: SNP calling from NGS data (GATK, BWA). • Lecture: Machine learning in predicting stress-tolerant genotypes. • Data Challenge: Identify candidate genes from RNA-seq data. • Panel Discussion: "Next-Gen MAS: AI & Big Data in Breeding." – **Applications & Final Projects** • Final Project: Develop a MAS strategy for a target grain crop & stress. • Presentations: Teams present MAS breeding proposals. • Certification & Networking: Industry experts, career guidance.	1 week		

Breeding and Seed Production (To Study the Technology of Growing Pollen Microspores in F1 Generations)	– **Methods of Haploid Plant Production/ Doubled Haploid** • Anther culture • Isolated microspore culture • Plant regeneration to obtain haploid plants • Chromosome doubling of haploid plants and seed production from DH plants	2 weeks	Agricultural Biotechnology Research Institute of Iran (ABRII), Karaj, Iran.	Prof. Dr. Mehran E. Shariatpanahi Number: +98-0912-4893255 Email: m_shariatpanahi2002@yahoo.com
	– **Microspore Embryogenesis for Doubled Haploids Production in Wheat** • Microspore Isolation and Culture • Embryogenesis and Plant Regeneration	2 weeks		
Breeding and Seed Production	• Learning bread wheat breeding programs in different agroclimatic zones of Iran • Learning durum wheat breeding programs in different agroclimatic zones of Iran • Learning barley breeding programs in different agroclimatic zones of Iran • Introducing the implementation of salt tolerance experiments indoors and outdoor • Introducing activities in the cereal's chemistry and technology unit • Introducing cereals pathology experiments indoor and outdoor • Introducing agronomic practices and measurements of physiological characteristic • Introducing Germplasm collection in the CRD Gene bank unit • Introducing DNA extraction and detection of molecular markers • Introducing the development of doubled haploid lines at CRD • Enriching knowledge on speed breeding, double haploid breeding, anther culture, and MAS (Marker-Based Selection) technologies in cereal crops. • Gain knowledge in marker-based selection, improve laboratory skills, and learn new types of markers	2 weeks	Seed and Plant Improvement Institute (SPII)	Dr. Goodarz Najafian Number: +98-9125644024 Email: goodarzn@gmail.com
	• Speed breeding in maize • Plant breeding programs in maize and forage crops in SPII	1 week		

	• Familiarization with NPGB and its main laboratories and scientific areas of activity. • Visiting laboratories and getting acquainted with ongoing scientific projects and research. (Dr. Soltani, Deputy Head of the Dep: Dr. Khodadadi) • Germination assay (Dr. Shahmoradi) • Synthetic bread wheat and Triticale, concepts (Dr. Jaffar Aghaei) • (Theory) • Selecting the appropriate parents (Triticum turgidum sp. AABBm and Aegilops tauschii, DD), (Dr. Jaffar Aghaei) (Literature review) • Interspecific hybridization, (Dr Jaffar Aghaei) (Field work) • Cytogenetic arts, (Dr. Bokaei) (Lab. work) • Plant Tissue Culture, concepts, variations, methods, etc. … (Dr. Amirbakhtiar) (Theory) • Visiting Plant Tissue Culture Companies and Labs (ABRII, Jahad Daneshgahi Center, Private Companies) (Dr Soltani) (Lab. work) • Embryo Rescue (Dr Ahmadi) (Lab. work)	2 weeks		
Crop Production (Cultivation and Biological Properties of Halophyte Plants)	– Introduction of halophyte plants (Salicornia, Suaeda, and Quinoa), usages and method of cultivation Main concerns about salt stress treatment method, sampling and so on	5 weeks	Agricultural Biotechnology Research Institute of Iran (ABRII), Karaj, Iran.	Dr. Parisa Koobaz Number: +98-912-1373124 Email: parisakoobaz@yahoo.com
	– Measurement of lipid and phospholipid content, determination of microelements (Na, K and Ca), determine ionic and ionizable polar molecules (anion and cation)	5 weeks		
	– Measurement of total terpenoid content in plant samples – Determination of fatty acids profile in seed samples of halophyte plants	5 weeks		
	– Ascorbic acid measurement (vitamin c) – Determination of antioxidant components (phenolic acids, total flavonoids, anthocyanins, carotenoids)	5 weeks		
	– Identification perspective halophyte and development recommendations for cultivating species	4 weeks		

Irrigation (Modern Irrigation Systems)	• Implementation, Monitoring and Evaluation of Smart Irrigation Management System • Technical Evaluation of Modern Irrigation Systems Field Visit to Model Designs	2 weeks	Agricultural Engineering Research Institute (AERI), Karaj, Iran	Prof. Dr. Hossein Dehghanisanij Number: +98-912-1675238 Email: dehghanisanij@yahoo.com
	• Smart Irrigation • Water Productivity and Irrigation Volume • Teaching the Basics and Training in the Et_o Calculator Software	1 week		
	• Presentation of the Hooshab System • Presentation of The Virtual Weather System	1 week		
Experimental Agrochemistry	• Principles and foundations of soil, water and plant testing and interpretation of results • Instrumental analysis laboratory (AAS, GFAAS, HGAAS, ICP-OES, HPLC, Spectrophotometers, and Flame photometers	1 week	Soil and Water Research Institute of Iran (SWRI)	Dr. Behnam Rajabpour Number: +98-912-384 1318 Email: behnam.rjbp@gmail.com
	• Soil and water chemistry laboratory analysis (sample preparation, pH, EC, soil texture, soil density, OC, CCE, CEC, Heavy metals determination methods). • Chemical and organic fertilizer analysis (sample preparation, pH, EC, and nutrients and etc.)	1 week		
	• Plant analysis laboratory analysis (determination of nutrients for fertilizer recommendation and crop production purposes, and testing the crop health regarding accumulation of pollutants such as nitrate, heavy metals, and pesticides). • Introducing the various types of chemicals, organic, biological fertilizers, and plant growth stimulants (visiting the fertilizer production factories) • Using biological potential to increase agricultural production	1 week		
	• Nutrition physiology and principles of fertilizer recommendations for crops and orchards crops (Field Visiting) • Salt affected Soils and their management • Determination of water requirement and water management on the farm • Land Evaluation for various plants cultivation	1 week		

Mechanization of Agricultural (Modern Engineering Programs for Designing and Creating 3D Models)	Development of New Design of 3D Adjustable Front Axle Tread of Tractor Using Solid Work	2 weeks	Agricultural Engineering Research Institute (AERI), Karaj, Iran.	Prof. Dr. Hossein Dehghanisanij Number: +98-912-1675238 Email: dehghanisanij@yahoo.com
	Determination of Minimum Turning Radius and Applied Loads on Front Axle Using Simulation Software	2 weeks		
Plant Physiology and Biochemistry (Enriching Knowledge on Speed Breeding, Doubled Haploid Breeding, Anther & Microspore Culture Technologies in Grain Crops)	– **Haploid System and Its Applications in Plant Breeding and Hybrid Seed Production** Introduction of in vitro/in vivo- based haploid system	1 week	Agricultural Biotechnology Research Institute of Iran (ABRII), Karaj, Iran.	Prof. Dr. Mehran E. Shariatpanahi Number: + 98-912-4893255 Email: m_shariatpanahi2002@yahoo.com
	– **Methods of Haploid Plant Production/ Doubled Haploid** • Anther culture • Microspore culture • Shed-microspore culture • Plant regeneration to obtain haploid plants • Chromosome doubling of haploid plants and seed production from DH plants – **Using the Reverse Breeding Process in Hybrid Seed Production** Access to inbred lines of commercial F1 hybrid seeds through reverse plant breeding engineering	1 week		
	– **Microspore Embryogenesis for Doubled Haploids Production** • Microspore Isolation and Culture • Embryogenesis and Plant Regeneration	1 week		

	– **Determination of Microspores Viability and Their Developmental Stage** • Determining developmental stage of microspores with DAPI staining • Determining viability of microspores with FDA staining – **Verification Techniques of Haploid Plants** • Cytogenetics • Flow cytometry	1 week		
Plant Science (Plant Protection)	• Weed Management (Principle & Procedure)	1 week	Iranian Research Institute of Plant Protection (IRIPP), Tehran, Iran.	Dr. Mehdi Minbashi Moeini Number: + 98-912-4358697 Email: mehdiminbashi@gmail.com
	• Weed Management in Cereals	1 week		
	• Weed Management in Oil Seed Crops	1 week		
	• Principle of Chemical Weed Management	1 week		
Plant Science (Plant Protection)	– Introduction of Important Disease of Rice	1 week	Iranian Research Institute of Plant Protection (IRIPP), Tehran, Iran.	Prof. Dr. Shahram Naeimi Number: +98-911-1277742 Email: shnaeimi@yahoo.com
	– Introduction of Fungal and Bacterial Biocontrol Agents for Controlling Rice Disease	1 week		
	– Isolation, Identification, and Formulation of Biocontrol Agents to Control Rice Disease	1 week		
	– Application and Delivery of Microbial Pesticides in the Field	1 week		
Plant Science (Modern Methods for Effective Use of Rainwater)	• Green Water Harvesting Methods (Rainwater)	1 week	Agricultural Engineering Research	Prof. Dr. Hossein Dehghanisanij Number: +98-912-

	• Methods For Estimating the Effective Amount of Precipitation and Water Requirement • Teaching the Basics and Training in the CropWat Software	2 weeks		
	• Environmental Issues of Water and Soil • Drainage And Wastewater Issues	1 week		
Silkworm Farming (Innovative Nanoparticle Formulations for Sustainable Silkworm Farming)	– **Introduction to ZnO Nanoparticles and NaCMC Polymer** Overview of properties, applications, biocompatibility, and safety of ZnO NPs and sodium carboxymethylcellulose • Theory: Nanoparticle basics, ZnO properties, NaCMC structure & applications • Practical: None (Introductory session) • Group Activity: Brainstorming applications in bio-med/entomology • Outcome: Understanding of materials' relevance and potential	1 week	Agricultural Biotechnology Research Institute of Iran (ABRII), Karaj, Iran.	Dr. Marjan Malekmohamadi Number: +98-919-2464977 Email: marjan.malekmohamadi@gmail.com
	– **Synthesis of ZnO/NaCMC Nanocomposites** Laboratory preparation of nanocomposites, solution formulation, and optimization of ZnO to polymer ratios. • Theory: Methods of synthesis (sol-gel, precipitation), mixing techniques • Practical: Lab synthesis of ZnO NPs and NaCMC blending • Group Activity: Preparing different formulations in subgroups • Outcome: Ability to synthesize and prepare nanocomposite solutions	1 week		
	– **Physicochemical Characterization of Nanocomposites** Techniques including DLS, zeta potential, SEM/TEM, UV-Vis, and FTIR to analyze particle size, surface charge, and structure. • Theory: Introduction to DLS, Zeta Potential, SEM, FTIR, UV-Vis • Practical: Performing characterization tests on synthesized samples • Group Activity: Data interpretation from instruments • Outcome: Skills in nanoparticle analysis and data analysis	1 week		

	– **Assessment of Antibacterial and Antioxidant Properties** Conducting antibacterial (disk diffusion, MIC) and antioxidant (DPPH, ABTS) assays • Theory: Antimicrobial mechanisms, assay protocols • Practical: Disk diffusion, MIC, DPPH/ABTS antioxidant tests • Group Activity: Comparing results between groups • Outcome: Ability to evaluate biological performance of nanomaterials	1 week		
	– **Stability Testing of the Nanocomposite Solutions** Studying the physical and chemical stability of formulations over time and under various storage conditions • Theory: Parameters for stability (pH, temperature, time) • Practical: Setting up stability trials under varying conditions • Group Activity: Longitudinal tracking of formulation properties • Outcome: Understanding of formulation durability and shelf-life	1 week		
	– **Optimization for Application on Mulberry Leaves** Determining safe and effective concentrations for treating mulberry leaves to feed silkworms • Theory: Dosing, toxicity, delivery methods via plant material • Practical: Testing different concentrations on mulberry leaves • Group Activity: Selecting optimal formulations based on results • Outcome: Skills in applied formulation and preparation for biological use	1 week		
	– **Introduction to Viral Diseases in Silkworms** Overview of common viral pathogens, symptoms, transmission, and impact on silkworm farming • Theory: Common viruses (NPV, CPV), pathology • Practical: Sample observation (images or preserved specimens) • Group Activity: Case studies of outbreaks • Outcome: Knowledge of disease types and impact on sericulture	1 week		
	– **Silkworm Immune System and Role of Antioxidants** Understanding innate immunity in silkworms and the potential of antioxidant-enhanced diets to boost defense mechanisms. • Theory: Insect innate immunity, ROS & antioxidants • Practical: Enzyme assays (e.g., catalase, SOD) demo or simulation • Group Activity: Mapping immune response pathways • Outcome: Understanding of immune-boosting via nutrition	1 week		

	– **Designing Feeding Trials with Treated Leaves** Setting up controlled experiments with treated and untreated mulberry leaves. Defining control and test groups. • Theory: Experimental design, treatment-control groups • Practical: Treating mulberry leaves, setting up trials • Group Activity: Designing and assigning group protocols • Outcome: Skills in animal testing setup and trial management	1 week		
	– **Behavioral and Clinical Observation of Silkworms** Monitoring changes in feeding behavior, growth rate, survival, and clinical symptoms post-treatment • Theory: Behavioral parameters, clinical signs • Practical: Daily observation and data recording • Group Activity: Compiling and comparing growth charts • Outcome: Monitoring and documentation skills in biological trials	1 week		
	– **Immunological and Biochemical Assessment** Evaluation of immune markers and biochemical parameters in hemolymph to assess immune response. • Theory: Hemolymph analysis, immune markers • Practical: Hemolymph extraction (demo), simulated ELISA or biochemical assays • Group Activity: Analyzing biomarker trends • Outcome: Familiarity with insect immune evaluation tools	1 week		
	– **Final Data Analysis and Practical Conclusions** Comparative analysis of experimental data, evaluation of treatment efficacy, and formulation of practical recommendations. • Theory: Statistical analysis, interpretation of multi-variable results • Practical: Using Excel/GraphPad or similar tools • Group Activity: Group presentations of results and discussion • Outcome: Competence in data analysis, teamwork, and scientific communication	1 week		
Soil and Water (Digital Control of Water-Saving Irrigation Technologies)	• Irrigation Planning and Water Management on the Farm • Drip Irrigation • Sprinkler Irrigation • Irrigation Machines	1 week	Agricultural Engineering Research Institute (AERI), Karaj, Iran.	Prof. Dr. Hossein Dehghanisanij Number: +98-912-1675238 Email: dehghanisanij@yahoo.com
	• Filtration • Pumping Stations • On-site Visit to Pressurized Systems	1 week		
	• Principles of Water Flow Measurement • Soil Moisture Measuring Devices • Types of Flumes	1 week		

	• Volume Meter Device • Flowmeter Device • General Soil Science and Soil Destruction (SWC Software)	1 week		
	• Water and Soil Qualitative Analysis Method • Soil Extraction • Soil Texture Measurement (Hydrometric Method)	1 week		
	• Pressure Plate Method • Water and Soil Quality • Spectrophotometer and Flame photometer	1 week		
	• ArcGIS • Google Earth • Google Earth Engine	1 week		
	• Remote Sensing • Water Accounting	1 week		
	• Types of Problematic Soils • Canal Lining Methods • Irrigation Canals	1 week		
	• Irrigation and Drainage Networks • Soil Mechanics Laboratory	1 week		
	• Water Allocation • Coding • MATLAB Software	1 week		
	• Adaptation to Climate Change in Agriculture • Irrigation Modernization • Integrated Water Management in the Field and Basin • Conjunctive Use of Surface and Underground Water Resources	1 week		
Soil Science	– Principles and foundations of soil, water and plant testing and interpretation of results – Instrumental analysis laboratory (AAS, GFAAS, HGAAS, ICP-OES, HPLC, Spectrophotometers, and Flame photometers	1 week	Soil and Water Research Institute of Iran (SWRI)	Dr. Behnam Rajabpour Number: +98-912-384 1318 Email: behnam.rjbp@gmail.com
	– Soil and water chemistry laboratory analysis (sample preparation, pH, EC, soil texture, soil density, OC, CCE, CEC, Heavy metals determination methods). – Chemical and organic fertilizer analysis (sample preparation, pH, EC, and nutrients and etc.)	1 week		
	– Plant analysis laboratory analysis (determination of nutrients for fertilizer recommendation and crop production purposes, and testing the crop health regarding accumulation of pollutants such as nitrate, heavy metals, and pesticides). – Introducing the various types of chemicals, organic, biological fertilizers, and plant growth stimulants (visiting the fertilizer production factories) – Using biological potential to increase agricultural production	1 week		

	– Nutrition physiology and principles of fertilizer recommendations for crops and orchards crops (Field Visiting) – Salt affected Soils and their management – Determination of water requirement and water management on the farm – Land evaluation for various plants cultivation	1 week		
Study of Primary and Secondary Metabolites of Halophytes (Study of Primary and Secondary Metabolites of Halophytic Plants as New Sources of Raw Materials for Agriculture and Medicine)	– Introduction of halophyte plants (focus on Salicornia, Suaeda, and Quinoa), usage and method of cultivation – Main concerns about salt stress treatment method, sampling and so on.	5 weeks	Agricultural Biotechnology Research Institute of Iran (ABRII), Karaj, Iran.	Dr. Parisa Koobaz Number: +98-912-1373124 Email: parisakoobaz@yahoo.com
	– Measurement of Lipid and phospholipid content, microelements (Na, K and Ca) measurement, determine ionic and ionizable polar molecules (anion and cation), vitamin D	5 weeks		
	– Extraction and characterization of aroma compounds in plant samples using GC/MS – GC-MS-base metabolite profiling (metabolite extraction, derivatization of metabolites and GC-MS analysis)	6 weeks		
	– Ascorbic acid measurement (vitamin c) – Carbohydrate content measurement (soluble, total and type of concentration) – Determination of antioxidant components (phenolic acids, total flavonoids, anthocyanins, and carotenoids)	5 weeks		
	– Identification perspective halophyte and development recommendations for cultivating species – Determination of promising halophyte plants for medical usages	3 weeks		
Sustainable Farming Practices (Cotton Care Agrotechnology System, Drip and Discrete Irrigation Systems)	Integrated Pest and Disease Management in Cotton Cultivation	1 week	Cotton Research Institute of Iran (CRII), Gorgan, Iran.	Dr. Rasmieh Hamid Number: +98-916-1001203 Email: rasmiehhamid@gmail.com
	Irrigation and Nutrient Management Systems in Cotton Production	1 week		
	Optimizing Cotton Production: Seed Treatment, Agronomic Practices, and Harvest Mechanization	2 weeks		