**Presentation**

POSTGRADUATE PROGRAM IN AGRONOMY - CONCEPT 5

The Postgraduate Program in Agronomy is developed under the responsibility of the Department of Phytotechnics and Environmental Sciences of the Agricultural Sciences Center – ASC - Campus II, Federal University of Paraíba, and it aims to train professors, researchers and professionals specialized in agronomy. Implemented in 1977, named as Postgraduate Course in Plant Production, at the Master level. Currently, the Master in Agronomy has a duration of 24 months and a Doctorate of 36 months, both operating on a quarterly basis, having a concentration area TROPICAL AGRICULTURE and four lines of research. For the Master's degree, it is allowed to apply candidates with a degree in Agronomic Sciences, Biology, Agricultural Engineering, Forestry Engineering, Environmental Engineering, Food Engineering, Geography, degree in Agrarian Sciences, Plant Science, Horticulture and Chemistry. For the Doctorate, it is allowed to apply candidates with a Master's degree in Agricultural Sciences, Biology, Agricultural Engineering, Forestry Engineering, Environmental Engineering, Food Engineering, Geography, degree in Agrarian Sciences, Phytotechnics, Horticulture and Chemistry.

**Courses**

AGRONOMY - Master’s Degree

AGRONOMY - Doctorate

**Area of Concentration**

**Doctorate**

TROPICAL AGRICULTURE

Research Areas:

SCIENCE AND TECHNOLOGY OF CROP PRODUCTION

ECOLOGY, MANAGEMENT AND CONSERVATION OF NATURAL RESOURCES

BIOTECHNOLOGY, IMPROVEMENT AND CULTIVATED PLANT PROTECTION

SCIENCE AND TECHNOLOGY SEED, POST-HARVEST BIOCHEMISTRY AND PHYSIOLOGY

**Master**

AGRICULTURE TROPICAL

Research Areas:

SCIENCE AND TECHNOLOGY OF CROP PRODUCTION

ECOLOGY, MANAGEMENT AND CONSERVATION OF NATURAL RESOURCES

BIOTECHNOLOGY, IMPROVEMENT AND CULTIVATED PLANT PROTECTION

SCIENCE AND TECHNOLOGY SEEDS, POST-HARVEST BIOCHEMISTRY AND PHYSIOLOGY

**Curriculum Structure> Doctorate and Master> 2020**

SEED PATHOLOGY 60h

History and importance of seed pathology. Seed diseases and injuries. Biology of the main seed pathogen groups. Mechanisms of infection and transmission of pathogens by seeds. Pathogens affecting stored seeds. Control of seed pathogens. Health analysis (methodology).

PLANT ECOLOGY 60h

General. Colonization, Ecological Succession and Stability. Physical factors that determine the differentiation of phytogeographic typologies. Study of plant communities. Relations between environment and vegetation. Vegetation classification. Phytogeography. Anthropic influence.

EMBRYOLOGY AND VEGETABLE MORPHOLOGY 60h

Study of the external and internal morphology of the plant organs, as well as their origin, using as main material the cultivated plants in the Northeast of Brazil.

CROP MANAGEMENT 60h

Importance of rainfed cultural manipulation in the Northeast and worldwide. Aspects of implantation, development, consortium, crop rotations and mixed (with animals). Ecopyrological aspects of crop management. Agroeconomic aspects of crop management.

IN VITRO CULTURE TECHNIQUES APPLIED TO AGRICULTURE 60h

Definition and background. Applications of tissue culture. Assembly of a tissue culture laboratory. Culture mediums. Growth phenomena and morphogenesis. Asepsis and sterilization. Phenolic Oxidation. Micropropagation. Stem apex culture. Micro grafting. Somatic embryogenesis. Callus culture. Biosynthesis of secondary products. Mutation and somaclonal variation. Embryo and ovarian culture. Protoplast culture and fusion. Anther culture. Haploid production. Production of transgenic plants. Conservation and exchange of germplasm. Acclimatization.

AGRICULTURAL PRODUCTION ECOPHYSIOLOGY 60h

Plant in the ecosystem. Radiation in the ecosystem. Utilization and cycling of mineral elements. Water in the plant and in the ecosystem. Interaction between plants: Competition.

POST HARVEST PHYSIOLOGY 60h

Metabolic transformations in the life cycle of harvested products. Respiratory process. Molecular metabolism associated with the respiratory process. Role of hormones in the maturation and maturation processes. Molecular metabolism associated with the mode of action of hormones. Environmental factors that affect ripening. Main causes of loss of fruits and vegetables. Maturity and postharvest quality indexes of fruits and vegetables. Postharvest technology and quality. Product storage under controlled and/or modified atmosphere, other storage systems and post-harvest treatments. Standardization, classification, packaging and transport of fruits and vegetables. Postharvest pathology. Use of chemicals. Postharvest technology applied to tropical fruits.

LARGE CROP PRODUCTION 60h

Synthetic study of the morphological and cultural characteristics and approach of the advanced models of agronomic research, related to the production of large crops, with extensive cultivation.

TROPICAL CLIMATE PRODUCTION 60h

Factors related to vegetable propagation, climate, soil, crop treatment, irrigation, air humidity, soil moisture. Mineral nutrition and discussion of experimental works of vegetables: character, sweet potato, tomato, onion, pepper, potato, carrot, cabbage, bean pod. Physiological aspects of the production of tubers, fruits and leafy vegetables.

ORGANIC AND CONVENTIONAL PRODUCTION SYSTEMS 60h

History of the concept within the sciences, theory and system approaches; The behaviors of agricultural production systems; Types of systems: ecological systems, traditional agricultural systems and agroecological systems; Preparation of systems research projects; Systems evaluation.

SPECIAL TOPICS I 60h

Aims to offer the student the opportunity to study current topics in the field, not in subjects offered, and deemed of importance to their final work.

SEED ANALYSIS 60h

Purpose of seed analysis. Rules for seed analysis. Sampling. Determination of moisture content. Purity analysis. Examination of harmful wild seeds. Germination test. Tetrazolium test. Additional Determinations. Analysis of coated seeds. Vigor tests. Tests for rapid seed quality evaluation.

PLANT BIOCHEMISTRY 60h

The plant cell, organelles and energy transduction. Photosynthesis; C2 Plants, C3 Plants, C4 Plants. Energy metabolism; Starch synthesis. Sucrose synthesis. Fatty acid and lipid synthesis. Cell wall - transport of metabolites. Biological nitrogen fixation. Synthesis of amino acids and proteins. Secondary metabolism. Metabolism of phenols. Metabolism of alkaloids. Plant defense metabolism. Metabolic responses to stress. Transport metabolism. Molecular metabolism associated with each metabolic process.

SEED PHYSIOLOGY 60h

Physiological quality of seeds. Germination. Cellular events during germination and seedling growth. Mobilization of reserves. Carbohydrate, lipid, protein and phosphate metabolism. Longevity. Metabolic aspects of dormancy. Seed vigor. Seed determination.

SEED PRODUCTION AND TECHNOLOGY 60h

Seed formation; Chemical structure; Germination; Dormancy; Seed vigor; Seed production fields; Seed field inspection; Technical rules for the production of supervised seeds and seedlings; Harvest; Drying; Beneficiation; Storage.

XEROPHILIC PLANT CROP 60h

History of agroforestry, especially in the Semi-arid Northeast. Studies of the main fruit and tree forest species of the semi-arid. Studies of non-wood products of native plant species (forage, medicine, energy, etc.). Multiple use of native cacti (animal feed, human food, hedge and ornamental). Study of the main types of agrosilvopastoral consortia.

ENVIRONMENTAL PLANNING 60h

Conceptualization, classification and importance of natural resources. Deterioration: natural and anthropogenic factors. The importance of renewable natural resources. Environmental planning: concepts, objectives and strategies of the environmental plan. Methodology: steps, basic assumptions. Sectorization and prioritization. Diagnostics: conservationist physicist, utility, water, vegetation, fauna, environmental and socio-economic pollution.

RECOVERY OF DEGRADED AREAS 60h

The is no content in this discipline. Why?

TROPICAL CLIMATE FRUIT I 60h

Crops: pineapple; banana; cashew; papaya; mango,; Origin: Botanical position and classification; Varieties; Economic and social importance of cultures; Main producing regions; Soil and climate requirements; Propagation; Culture installation; Crop and phytosanitary treatments; Fruiting; Harvesting, packaging and transportation; Commercialization; Production costs; Industrialization.

NUTRIENT CYCLING IN NATURAL ECOSYSTEMS 60h

SOIL SALINITY IN IRRIGATED AREAS 60h

Origin of salt problems, salinization and alkalinization of land. Quality of irrigation waters. Transport of soil salts by irrigation. Potential hazards of salinization and alkalinization of soils by irrigation waters. Importance of salts for fertility, plant nutrition and product quality. Osmotic adjustment of plants to salts.

PALNT CYTOGENETICS 60h

Understanding the processes involved in molecular and subphases of phases and mitosis and meiosis; Understand the processes of karyotypic evolution involved in the evolution of major groups of plants; Learn how to prepare slides with conventional and differential staining.

TROPICAL CLIMATE FRUITS II 60h

Importance of native tropical fruits and strategies for their insertion in the market. Origin, distribution and genetic resources of tropical fruit trees. Native tropical fruits from America. Tropical fruits native to Brazil. Quality and potential use of tropical fruits native to Brazil. Recommended use and exploitation of native tropical fruit.

GENETICS OF NATIVE PLANT POPULATIONS 60h

Random mating populations. Applications and extensions of the law of equilibrium. Multiple alleles. Maximum likelihood estimation method. Genes linked to sex. Genetic variance and correlation. Migration and mutation. Selection. Small populations.

INTEGRATED MANAGEMENT OF DISEASES 60h

Introduction. Principles involved in disease control. Chemical control, biological control, cultural control and physical control, genetic control. Seed Pathogen Management, Seed Treatment Post Harvest Disease Management, Post Harvest Treatment Fungus resistance to fungicides. Plant transformation aiming disease resistance. Plant resistance to disease. Acquired systemic resistance. Cultural management for disease control, Philosophy of integrated disease management.

INTEGRATED INSECT MANAGEMENT 60h

Introduction to integrated insect management; Ecological basis of integrated insect management; Economic and social aspects of integrated insect management; Strategies and tactics of integrated insect management; Integrated insect management of major crops; Research and teaching in integrated insect management.

PLANT IMPROVEMENT METHODS 60h

Germplasm banks. Genetic principles, objectives, techniques, special problems and their applications in the plant breeding system. Methods of improvement of autogamous, allogamous and asexual propagated plants.

NUTRIENT CYCLING IN NATURAL ECOSYSTEMS 60h

The Soil-Plant System. The essentials elements. Dynamics and function of organic matter. Reactions of organic matter. Organic matter and pedogenesis. Litterfall and nutrient cycling. Microbial biomass and nutrient cycling. Effects of fire on soil.

SOIL FERTILITY 60h

Essential elements for plants. Physical and chemical properties of soil. Nutrient transport in the soil. Soil reaction. Soil acidity correction and calcium and magnesium fertilization. Nitrogen, phosphorus, potassium and sulfur. Micronutrients. Organic matter. Soil fertility assessment. Fertilizers. Fertilization recommendation. Influence of fertilizer use.

MANAGEMENT AND CONSERVATION OF SOIL 60H

Climate characterization of the tropical environment. Soil adaptability and agricultural uses. Degradation of soils and their recovery. Integration of soil management practices. Soil preparation. Main hydrological processes and prediction of runoff. Erosion mechanics, soil erosion measurement systems and water erosion control. Soil productive capacity; Agricultural aptitude of land and land use capacity.

SOIL MICROBIOLOGY 60h

General characteristics of the soil microbiota. Microbial ecology of the soil. Biochemical activity of microorganisms in soil. Microbial transformations of essential nutrients and toxic elements. Rhizosphere microbiology. Biological nitrogen fixation. Waste recycling and its use. Mycorrhizal associations. Xenobiotic compounds and their interaction with soil microbiota.

MINERAL PLANT NUTRITION 60h

Relationship of plant nutrition to mineralogical, physical, chemical and biological soil properties. History of plant mineral nutrition. Essential elements to plants. Root and leaf absorption of the essential elements. Transport and redistribution of essential elements. Anionic and cationic macronutrients. Cationic and anionic micronutrients. Elements useful to plants. Toxic elements to plants. Disease management with macro and micronutrients. Characterization of nutritional deficiencies in grasses and legumes. Interpretation of soil analysis in light of plant mineral nutrition. Correction of nutritional deficiency through foliar application of nutrient deficiency. Leaf diagnosis. Studies on nutrition in disability. Leaf diagnosis. Studies on plant mineral nutrition and interaction with substrate salinity.

SOIL SALINITY IN IRRIGATED AREAS 60h

Origin of salt problems, factors and processes of salinization and alkalinization of land. Quality of irrigation waters. Transport of soil salts by irrigation. Potential hazards of salinization and alkalinization of soils by irrigation waters. Importance of salts for fertility, plant nutrition and product quality. Osmotic adjustment of plants to salts.

PLANT PHYSIOLOGY 60h

The plant cell and its osmotic relationships. Water-plant relationship: water absorption, translocation and losses. Effects of water stress on plant physiology. Absorption and transport of ions: root absorption and leaf absorption. Production physiology: C4, C3 and CAM plants. Drought resistance. Physiology of xerophilous plants. Growth and development: the plant hormones.

EXPERIMENTAL STATISTICS I 60h

Basic Design Mathematical Models. Significance tests. Factorial tests. Tests in subdivided parcels. Joint analysis of essays. Regression studies. Rehearsal planning.

EXPERIMENTAL STATISTICS II 60h

Mathematical hope. Contrasts. Decomposition of degrees of freedom in orthogonal contrasts. Variance components in experimental models. Covariance analysis. Regression analysis. Correlation Analysis. Use of SAEG Software (System for statistical analysis). Case studies.

HIGHER EDUCATION METHODOLOGY 60h

The teacher, student and society. Methods, instruments and teaching plan and its structuring. Evaluation of the teaching-learning process. Teaching plan and its systematization.

METHODOLOGY OF SCIENTIFIC RESEARCH 60h

Media. Concepts. Features. Tenses. Types of research models. Different methodological approaches. Research problems settings. Bibliographic survey. Elaboration of research projects. Scientific communication.

SEMINAR I 60h

How to prepare and present a 10-minute technical seminar: public speaking, visual audio types, personal appearance; How to prepare and present a poster: format, content.