

Master program at Plant production Department (Crop Sci. Section)

PPS 500 Advanced Crop Physiology

3(2+1)

Plant cell structure and functions. Plant cell water relations. Photosynthesis and respiration (photo and thermo-chemical reactions, analysis photosynthetic pathways of C₃, C₄ and Crassulacean acid metabolism [CAM] and the effect of environmental factors). Photosynthetic efficiency in agricultural crops (photosynthesis, photorespiration, the potential for increasing crop photosynthesis, canopy architecture and interception of solar radiation, optimum and maximum leaf area indices). Translocation in phloem. Source-sink relationship. Dry-matter partitioning. Growth and development (growth measurements and analysis, factors affecting growth, chemical growth regulators, phytochrome). Carbon isotopic discrimination and water use efficiency in plants. Stress physiology. Environmental pollutants affecting physiological process in plant.

PPS 501 Environmental Stress Physiology

2 (2+0)

Environmental stresses; definitions, sources, types, interactions and effects on plant growth stages (seed germination, vegetative stage, flowering and reproductive stages). Effect of stresses on plant physiological process (water and minerals absorption, photosynthesis, respiration, translocation and partitioning, nitrogen metabolism, nitrogen fixation and hormonal balance). Plant response to stresses (adaptation, hardening, resistance and physiological mechanisms). Factors affecting plant resistance to environmental stress. Plant growth improvement under environmental stress conditions.

PPS 502 Crop Water Relations

2 (2+0)

Water properties and functions. Aqueous solutions and measuring concentration. Plant cell water relations. Water potential and its components. The importance of water in plants. Water in soil and plants. Root growth and functions. Absorption mechanisms and water movement through plants. Factors affecting the absorption of water. Evapotranspiration and crop water consumption. Agricultural crop water requirements. Water use conservation. Water deficits and plant growth. Drought and tolerance mechanisms. Salts and crop water status. Measurement of water status in soil and plant. (Requisite: SOSC 362 Soil Water and Plant Relationship).

PhD program at Plant production Department (Crop Sci. Section)

PPS 620 Crop Ecophysiology

3(2+1)

The plant environment interaction in relation to growth and production of agricultural crops - Radiant energy - The plant's energy balance - Effect of radiation- photosynthesis - Light and dark reactions – Respiration - Water and temperature relationships in crop stand - Mineral nutrition - Nutrient toxicity - Effect of soil nutrient supply on photosynthesis - Effect of air pollutants on physiological processes in plants – Biotic and abiotic factors and their impact on the growth and crop productivity - Crop allocation and storage (source sink relationship) - Growth analysis -Adaptation and acclimation to stresses. Improve productivity under stress conditions

PPS 621 Crop Seed Physiology

2(2+0)

Importance and characteristics of Crop seeds - Seed structure - Chemical composition of seeds - Environmental control of seed germination - Imbibition and germination - Metabolism of germination seeds -Breakdown of storage reserves - Causes of dormancy – Physiology and Biochemistry of dormancy - Seed vigor - Seed development and vigor - Expression and evaluation of vigor- Storage of seeds and the factors influencing - Effect of seed quality on stand establishment - Environmental factors to be considered during establishment Field seeding and transplanting - Methodology to improve stand uniformity and emergence.

***These Courses have been teaching under Specialization
in crops by Prof. Ali Alderfasi***

