

The Agriculture Scientist Recruitment Board (ASRB) of Indian Council of Agricultural Research

Syllabus for **Economic Botany & Plant Genetic Resources** for the benefit of the aspirants preparing for ASRB NET Examination. Candidates can go through the syllabus and prepare better for this exam.

Unit 1: Plant Taxonomy and Biosystematics

Nomenclature, purpose, principles and systems of classification; Taxonomy of higher plants, floras, manuals, monographs, index, catalogues and dictionaries, herbaria; Concepts of biosystematics, evolution and differentiation of species; Biosystematics and taxonomic tools; Origin, evolution and biosystematics of selected crops (rice, wheat, rape seed & mustard, cotton).

Unit 2 : Economically important plants –I

Origin, history, domestication, botany, genetic resource activities, cultivation, production and use of: Cereals: Wheat, rice, maize, sorghum, pearl millet and minor millets. Pulses: Pigeon pea, chickpea, black gram, green gram, cowpea, soyabean, pea, lentil, horsegram, lab-lab bean, ricebean, winged bean, French bean, lima bean, sword bean. Oilseeds: Groundnut, sesame, castor, rape seed, mustard, sunflower, safflower, niger, oil palm, coconut and linseed.

Unit 3 : Economically important plants –II

Origin, distribution, cultivation, production and utilization of economic plants of following groups such as Fibres: cotton, silk cotton, jute, sunnhemp, agave, flax and mesta (kenoff); Sugars: sugarcane, sugarbeet, sugarpalm and sweet sorghum; Fodders and green manure crops: Plantation crops: coconut, cocoa, tea; root and tuber crops:- potato, sweet potato, tapioca, aroids etc.

Unit 4 : Economically important plants –III

Origin, distribution, classification, production and utilization of Fruits: mango, banana, citrus, guava, grapes and other indigenous fruits; apple, plum, pear, peach, cashewnut and walnut; Vegetables: tomato, brinjal, okra, cucumber, cole crops, gourds etc.; Fumigatories and masticatories: tobacco, betelvine, areacanut; medicinal and aromatic plants: sarpagandha, belladonna, cinchona, nux-vomica, vinca, mentha and glycyrrhiza, plantago etc.; Narcotics: cannabis, datura, gloriosa, pyrethrum and opium; Dye-, tannin-, gum- and resin- yielding plants; Plant of agro-forestry importance: multipurpose trees/shrubs, subabool, Acacia nilotica, poplar, sesbania, neem etc.; non-traditional economic plants: jjoba, guayule, jatropa, carcus etc.

Unit 5 : Biodiversity and Plant Genetic Resources (PGR)

Biosphere and biodiversity; plant species richness and endemism; concept and importance of plant genetic resources and its increasing erosion; Centres of origin and diversity of crop plants, domestication, evaluation, bioprospecting; National and International organizations associated with PGR; Convention on Biological Diversity (CBD), recent issues related to access and ownership of PGR, IPR, PBRs, farmers rights, sui-generis system etc.

Unit 6 : Germplasm Augmentation

History and importance of germplasm collection, Eco geographical distribution of diversity, logistics of exploration and collection, use of flora and herbaria, random and selective sampling, genepool sampling in self and cross pollinated species; Concept, importance and Eco geographical considerations of introduction and exchange of plant germplasm; prerequisites conventions and achievements of PGR exchange. 10

Unit 7 : Germplasm Conservation

Principles and methods of conservation, in situ and ex situ methods, on – farm conservation; Gene banks: short-medium- and long-term conservation strategies; seed physiology and seed technology in conservation; seed storage behaviour (orthodox, recalcitrant), field gene banks, clonal repositories. Gene bank management, gene bank standard for various crops, ISTA, AOSA, IPGRI guidelines, documentation of information in gene bank.

Unit 8 : Biotechnology in PGR

Plant conservation biotechnology, biotechnology in plant germplasm acquisition; plant tissue culture in disease elimination, in vitro conservation and exchange; cryopreservation, transgenics – exchange and biosafety issues; biochemical and molecular approaches to assessing plant diversity.

Unit 9 : Plant Quarantine

Principles, objectives and relevance of plant quarantine; Regulations and plant quarantine set up in India; economic significance of seed borne pests, pathogens and weeds; detection and post entry quarantine operations, salvaging of infested/infected germplasm, domestic quarantine.

Unit 10 : Germplasm characterization, evaluation, maintenance and regeneration

Principles and strategies of PGR evaluation, approaches in germplasm characterization and diversity analysis, concept of core collection, descriptors and descriptor states for data scoring; maintenance of working and active collections of self-cross-pollinated and vegetative propagated crops, perennials and wild relatives; principles and practices of regeneration in relation to mode of reproduction, concept of genetic integrity, genetic shift, genetic drift and optimum environment; post-harvest handling of germplasm; PGR data base management.