

RAJASTHAN PUBLIC SERVICE COMMISSION

Syllabus for screening test for the Post of Agriculture Research Officer (Agronomy)

Agriculture Department

Agriculture and Indian economy, agro-climatic zones of India and Rajasthan and their characteristics, factors affecting crop production, tillage: objectives, types and modern concepts in tillage: zero, minimum and conservation tillage, climate change and agriculture, global warming, causes and effects. Precision agriculture, plant growth regulators and their role in agriculture, growth and development, crop growth analysis, cardinal points, source-sink relationship.

Agroclimatology: weather and climate, their elements and relation with crop production, solar radiation: characteristic and energy balance in atmosphere, photosynthesis and efficiency of radiation utilization by crops. Precipitation and humidity. Monsoon: types, onset and withdrawal in India and Rajasthan. Weather forecasting and remote sensing in India, atmospheric pollution and its impact on climate and crop production.

Role of water in crop production, water resources of India and Rajasthan, irrigation statistics in India and Rajasthan, status of ground water depletion in Rajasthan, soil-water-plant atmosphere relationship, mechanism of water movement in soil, theories and mechanism of water absorption, soil moisture measurement, evapotranspiration, water requirement of field crops. Irrigation: methods, evaluation and scheduling, moisture stress and its mitigation, management of excess soil water and drainage, water saving techniques under irrigated conditions and conjunctive use, pressurized irrigation and fertigation, drainage, management of salt-affected soils and brackish irrigation water, consumptive use and water use efficiency.

Criteria of essentiality of plant nutrients, their role and deficiency symptoms, soil fertility and productivity concept, forms of nutrients uptake, nitrogen: transformation in soil, mineralization of N-compounds, losses of N in soil, methods to increase N-use efficiency, slow release fertilizers, phosphorus : availability and P-fixation, practices of improving applied and native phosphorus in soil, potassium : fixation and release of potassium, bio-fertilizers, N, P and K fertilizers and their application methods, compound fertilizers, secondary and micro nutrients, inter-relationship of nutrients availability and soil pH , integrated nutrient management.

Weeds: biology, ecology and classification. Weed prevention, control and eradication. Herbicides: history, classification, mode of action, basis of selectivity, weed control principles and management practices in field crops, weed control under specific situations viz. non-cropped area, noxious farm weeds, parasitic weeds and their control, persistence of herbicides in soil, integrated weed management, herbicide resistance in weed and crops.

Dry farming: role in economy, types, problems of crop production in dry land farming, moisture stress, mechanism of crop adaptation for dry land, *in situ* moisture conservation techniques. Mulches and antitranspirants: types, their use and practical relevance. Contingent planning and mid-season corrections for aberrant weather situations, water harvesting, watershed management, improved dryland technology, alternate land use system, land degradation: types and their extent, soil erosion: types and management and land capability classification.

Cropping systems: Principles and practices, cropping systems under irrigated and rain fed situations, assessment of yield advantages, integrated farming system: meaning, scope and different models, crop residue management, crop diversification, organic farming, its certification, principles and accreditation, green farming, sustainable agriculture, natural resources management.

Introduction, origin, history, production, distribution, cultural practices, plant protection and varieties of cereals, pulses, oilseeds, fibre, forage sugar and commercial crops as well as area, production and productivity at national and state level, post-harvest technologies in agronomical crops.

Principles of experimental design, correlation and regression analysis. Analysis of variance and co-variance. Statistical Designs used in Agronomical Experiments, transformation of data,

Pattern of question papers:

1. Objective type paper
2. Maximum marks : 100
3. Number of question : 100
4. Duration of paper : Two hours
5. All question carry equal marks
6. There will be negative marking.
