

SYLLABUS FOR HORTICULTURE EXTENSION ASSISTANT

- Scope and importance of Horticulture and Horticultural crops, area and production, imports and exports, nutritive value of horticultural crops. Classification of Horticultural crops. Agro-climatic Zones of India and Nagaland in relation to Horticultural crops. Scope for Horticultural development in Nagaland and factors limiting horticultural crop production.
- Nursery techniques; different propagating structures; Bud wood certification, nursery registration Act. Orchard management, pollination & fruit set problems in orchard, Principles, planning and layout of Orchards, fencing, wind breaks, spacing, systems of planting and planting densities, propagation; training and pruning of fruit crops- principles and methods, plant growth regulators; method of irrigation and fertilizer application; cropping systems, crop regulation in relation to cropping system; rejuvenation of old orchard and top working. Methods of plant propagation-Sexual & Asexual – their advantages and disadvantages; Incompatibility; seed dormancy; seed treatment, specialized parts of propagation, micro-propagation.
- Production Technology of major Fruit crops, pre and post-harvest management of major tropical, subtropical and temperate fruit crop, value addition and processing, marketing. Crop improvement, pest and disease management in Fruit crops.
- Vegetable crop- role in human nutrition. Production technology of important tropical and temperate vegetable crops. Vegetables seeds production, techniques of raising nursery in different vegetable crops; Breeding methods and crop improvement of vegetable crops; Physiological disorder; Pests and disease of vegetables.
- Scope and importance of commercial Floriculture. Production technology of major loose flower crops. Production technology and post-harvest management of major cut flowers. Physiological disorders; postharvest management of cut flowers; Techniques for flower drying; landscaping- Basic principles and elements of land scape design, principle of gardening. Gardens- Special types, components, structures, adornments, methods of designing, lawn making and plants for landscaping. Flower arrangement; Bio aesthetic planning; Bonsai culture. Herbal gardens, Aeroponics, Hydroponics, terrace gardening, urban and Peri-urban Horticulture. Protected cultivation of flowers and vegetables.
- Production technology, Post harvest management and value addition of major Spices, condiments and plantation crops. Medicinal and aromatic crops cultivation in India and

Nagaland- Production Technology, harvesting and processing, chemical composition, extraction, use of important medicinal and Aromatic crops.

Post harvest technology in horticultural crops, maturity indices, harvesting, handling, grading of fruits, vegetables, cut flowers, plantation crops, medicinal and aromatic plants. Pre harvest factors; deterioration-Physiological and biochemical changes. Post-harvest treatments; quality parameters and specifications; Storage, packaging and transport; Food Processing techniques. Principles and methods of preservation of fruits and vegetables, Preparation of various products from fruits and vegetables; Food spoilage; Quality control of processed products, govt. policy on import and export of processed fruits and vegetables.

- Insects Pest of fruits, plantation, medicinal, Aromatic crops, vegetable, Ornamental and spice crops. Integrated Pest Management. Nematode pests and their management, Apiculture, Sericulture, lac culture.
- Plant diseases, pathogens, their survival and spread, disease symptoms, etiology and plant disease management. Integrated Disease management practices in Fruits, vegetables, Flower crops, medicinal and Plantation crops. Mushroom cultivation- Pest and disease management.
- Importance of soil, soil genesis, classification and morphology, soil sampling and testing, Plant nutrients- macro and micro nutrients, nutrient accumulation, nutrient uptake and nutrient removal, Stout criteria of essentiality, essential elements-classification, functions. Deficiency symptoms and remedial measure. Organic matter and their importance, humus – Types, importance of humus, manures (organic & inorganic) and manuring. Fertilizers- definition and classification, difference between organic manures and fertilizers, classification of fertilizers, fertilizer scheduled- time and method of application, fertilizer use efficiency. Problem soils- causes and their reclamation. Biofertilizers and Bioagents, Integrated Plant Nutrient management.
- Structure of plant cells and organs; Principles of plant genetics; Mendel laws; gene action, mutations; chromosomes; cell division, DNA, RNA and protein synthesis; linkage and crossing over; Chromosomal aberrations. Plant Bleeding – Scope and importance; floral biology, emasculation and pollination techniques in horticultural crops.
- Plant genetic resources- application in crop improvement; modes of pollination and reproduction. Methods of breeding in self, cross and vegetatively propagated crops. Self incompatibility and male sterility. Breeding objectives, methods and important concepts

of breeding, procedures of varietal and hybrid development in major fruit, vegetables, ornamental and plantation crops. Breeding for insect, disease and drought resistance. Plant biotechnology-sterilization techniques; Plant tissue culture and genetic engineering methods and application in crop improvement. Gene transfer methods, transgenic plants; molecular markers; marker assisted selection. Seed technology, seed quality-seed classes Deterioration of crop varieties. Seed production of major horticulture crop. Seed Certification seed act etc, IPRs; Seed storage, Seed treatment; drying and processing of seeds.

- Classification of weeds, propagation and dissemination; concept of weed prevention, control and eradication; Integrated Weed Management in major horticultural crops, Organic production requirements, Biological intensive Nutrient Management, integrated disease and Pest Management in Horticultural crops. Classification of Agro/HortiForestry systems. Water management-water requirement of different horticultural crops, various irrigation methods – drip, sprinkler, fogging etc water use efficiency, Evapotranspiration, water stress, life-saving irrigation, scheduling of irrigation. Plastic culture and mulching. Organic Farming, Precision Farming, Integrated Farming Systems.
- Plant Bio Chemistry-Proteins, lipids, carbohydrates, enzymes and plant pigments- their physical and chemical properties. Mode of action and metabolism of carbohydrates, seed Physiology, structure and development, physiological maturity, harvestable Maturity, seed viability and vigour; water relations in plants; Plant nutrition, Physiological role of plant nutrients; Photosynthesis, Seed Dormancy; Physiology of flowering, pollination, fruit set, fruit drop- Causes and Prevention, unfruitfulness associated with external and internal factors; Plant growth regulators, Role of plant growth regulators and their commercial application in Horticulture. Micro-biology-General properties of microorganisms. Biogas production, Microbial inoculants, Micro bio pesticides; microbial agency for control of plant disease.
- Farm power – sources, implements and equipment used in farm operations. Surveying and levelling; soil erosion; drip and sprinkler irrigation systems, water harvesting structures and water shed development. Natural resources, ecosystem, biodiversity, environmental pollution and global warming. Horticultural waste management, climate change, Environmental protection Act.
- Statistics; frequency; measures of central tendency, dispersion; testing of hypothesis; correlation and regression; experimental designs. Computers-anatomy operating

systems; WINDOWS-MS OFFICE-MS ACCESS-MS WORD-MS POWER POINT-MS EXCEL.

Division of economics; economic systems; classification of goods, utility, Demand & supply; factors of production; Theories of population; capital, theories of interest. Farm management; various economic principle applied to farm management, cost and income measures, types of farming, farm planning; farm records, capital budgeting techniques.

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- Extension education-teaching and learning; Audio-visual aids; rural development; sociology; rural sociology-education psychology-transfer of technology-farm women and rural youth-programme planning process-participatory rural appraisal-leadership management and administration-human resource development. Forms and methods of communication, group communication methods; entrepreneurship development, small and medium enterprise (SMEs/SSIs), SWOT analysis, Public and private partnerships. Export and import policies relevant to Horticultural sector, Globalization and emerging entrepreneur environment.

