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NH-52, Namsai, Arunachal Pradesh -792103

MASTER OF SCIENCE (HORTICULTURE- VEGETABLE SCIENCE) – SECOND SEMESTER

Second Semester			
S. No.	Name of Subject	Credits	Total Marks
1	Seed Production Technology of Vegetable Crops	5	100
2	Production Technology of Under Exploited Vegetable Crops	5	100
3	Organic Vegetable Production Technology	5	100
4	Modern Concepts in Crop Production	5	100
5	Research-II	4	100
Total		24	

Subject Name: SEED PRODUCTION TECHNOLOGY OF VEGETABLE CROPS

UNIT I

Definition of seed and its quality, new seed policies; DUS test, scope of vegetable seed industry in India.

UNIT II

Genetical and agronomical principles of seed production; methods of seed production; use of growth regulators and chemicals in vegetable seed production; floral biology, pollination, breeding behaviour, seed development and maturation; methods of hybrid seed production.

UNIT III

Categories of seed; maintenance of nucleus, foundation and certified seed; seed certification, seed standards; seed act and law enforcement, plant quarantine and quality control.

UNIT VI

Physiological maturity, seed harvesting, extraction, curing, drying, grading, seed processing, seed coating and pelleting, packaging (containers/packets), storage and cryopreservation of seeds, synthetic seed technology.

UNIT V

Agro-techniques for seed production in solanaceous vegetables, cucurbits, leguminous vegetables, cole crops, bulb crops, leafy vegetables, okra, vegetatively propagated vegetables.

Practical

Seed sampling, seed testing (genetic purity, seed viability, seedling vigour, physical purity) and seed health testing; testing, releasing and notification procedures of varieties; floral biology; rouging of off-type; methods of hybrid seed production in important vegetable and spice crops; seed extraction techniques; handling of seed processing and seed testing equipments; seed sampling; testing of vegetable seeds for seed purity, germination, vigour and health; visit to seed processing units, seed testing laboratory and seed production farms.

Suggested Readings

1. Agrawal PK & Dadlani M. (Eds.). 1992. Techniques in Seed Science and Technology. South Asian Publ.
2. Agrawal RL. (Ed.). 1997. Seed Technology. Oxford & IBH.
3. Bendell PE. (Ed.). 1998. Seed Science and Technology: Indian Forestry Species. Allied Publ.
4. Fageria MS, Arya PS & Choudhary AK. 2000. Vegetable Crops: Breeding and Seed Production. Vol. I. Kalyani.
5. George RAT. 1999. Vegetable Seed Production. 2nd Ed. CABI.
6. Kumar JC & Dhaliwal MS. 1990. Techniques of Developing Hybrids in Vegetable Crops. Agro Botanical Publ.
7. More TA, Kale PB & Khule BW. 1996. Vegetable Seed production Technology. Maharashtra State Seed Corp.
8. Rajan S & Baby L Markose. 2007. Propagation of Horticultural Crops. New India Publ. Agency.
9. Singh NP, Singh DK, Singh YK & Kumar V. 2006. Vegetable Seed Production Technology. International Book Distributing Co.
10. Singh SP. 2001. Seed Production of Commercial Vegetables. Agrotech Publ. Academy.

Subject Name: PRODUCTION TECHNOLOGY OF UNDER EXPLOITED VEGETABLE CROPS

UNIT I

Asparagus, artichoke and leek

UNIT II

Brussels's sprout, Chinese cabbage, broccoli, kale and artichoke.

UNIT III

Amaranth, celery, parsley, parsnip, lettuce, rhubarb, spinach, basella, bathu (chenopods) and chekurmanis.

UNIT IV

Elephant foot yam, lima bean, winged bean, vegetable pigeon pea, jack bean and sword bean.

UNIT V

Sweet gourd, spine gourd, pointed gourd, Oriental pickling melon and little gourd (kundru).

Practical

Identification of seeds; botanical description of plants; layout and planting; cultural practices; short-term experiments of underexploited vegetables.

Suggested Readings

1. Bhat KL. 2001. Minor Vegetables - Untapped Potential. Kalyani.
2. Indira P & Peter KV. 1984. Unexploited Tropical Vegetables. Kerala Agricultural University, Kerala.
3. Peter KV. (Ed.). 2007-08. Underutilized and Underexploited Horticultural Crops. Vols. I-IV. New India Publ. Agency.
4. Rubatzky VE & Yamaguchi M. (Eds.). 1997. World Vegetables: Principles, Production and Nutritive Values. Chapman & Hall
5. Srivastava U, Mahajan RK, Gangopadyay KK, Singh M & Dhillon BS. 2001. Minimal Descriptors of Agri-Horticultural Crops. Part-II: Vegetable Crops. NBPGR, New Delhi.

Subject Name: ORGANIC VEGETABLE PRODUCTION TECHNOLOGY

UNIT I

Importance, principles, perspective, concept and component of organic production of vegetable crops.

UNIT II

Organic production of vegetables crops, viz., solanaceous crops, cucurbits, cole crops, root and tuber crops.

UNIT III

Managing soil fertility, pests and diseases and weed problems in organic farming system; crop rotation in organic horticulture; processing and quality control for organic foods.

UNIT IV

Methods for enhancing soil fertility, mulching, raising green manure crops. Indigenous methods of compost, Panchagavya, Biodynamics, preparation etc Pest and disease management in organic farming; ITK's in organic farming. Role of botanicals and biocontrol agents.

UNIT V

GAP and GMP- Certification of organic products; organic production and export -opportunity and challenges.

Practical

Method of preparation of compost, vermicomposting, biofertilizers, soil solarization, bio pesticides in horticulture, green manuring, mycorrhizae and organic crop production, waster management, organic soil amendment for root disease, weed management in organic horticulture. Visit to organic fields and marketing centers.

Suggested Readings

1. Dahama AK. 2005. Organic Farming for Sustainable Agriculture. 2nd Ed. Agrobios.
2. Gehlot G. 2005. Organic Farming; Standards, Accreditation Certification and Inspection. Agrobios.
3. Palaniappan SP & Annadorai K. 2003. Organic Farming, Theory and Practice. Scientific Publ.
4. Pradeepkumar T, Suma B, Jyothibhaskar & Satheesan KN. 2008.
5. Management of Horticultural Crops. New India Publ. Agency.
6. Shivashankar K. 1997. Food Security in Harmony with Nature. 3rd IFOAMASIA, Scientific Conf.. 1- 4 December, 1997, UAS, Bangalore.

Subject Name: MODERN CONCEPTS IN CROP PRODUCTION

Agronomic aspects in food security; Crop growth and production in relation to climate change; Agro ecological and agroclimatic zones of India; Concept of potential yield; Modern concepts in tillage - zero, minimum and conservation tillage; Optimization of plant population and planting geometry in relation to soil fertility, solar radiation and available moisture regimes; Mitscherlich, Baule and Inverse yield : nitrogen laws; Biotic and abiotic stresses; Concept of ideal plant type; Organic farming, Physiology of grain yield in cereals; Crop growth analysis; Crop modelling in agronomic systems; Precision agriculture; Growth regulators and their role in agriculture; Designer crops; Vermi-technology; Agro biodiversity; Seed priming; ; Indigenous technological knowledge; Herbicide resistance in weeds; Allelopathy in agriculture ; Plant nutrition and disease tolerance in field crops

Subject Name: RESEARCH-II