

# M.Sc. (Ag.) (Agronomy)

## Minor

- **Course Title** : **Production of Cool Season Vegetable Crops**
- **Course Code** : **HOR 503**
- **Credit Hours** : **(2+1)**
- **Need of course?**

Cool season vegetables are a major source of dietary fibres, minerals and vitamins. Some of these vegetables also contribute protein, fat and carbohydrate. Most of the leafy and root vegetables are rich in minerals, especially in micro-elements such as copper, manganese and zinc. Vegetables differ in their temperature requirement for proper growth and development. Most of the winter vegetable crops are cultivated in cool season when the monthly mean temperature does not exceed 21°C. Even in temperate climate, these vegetables are cultivated in spring summer in hilly tracks where the day time temperature in summer is less than 21°C. The students of vegetable science need to have an understanding of production technology of important cool season vegetable crops and their management.

- **Objective of Course**

To impart knowledge and skills on advancement in production technology of cool season vegetable crops

The course is constructed given as under:

No. Block	Unit
• Production of cool season vegetable Bulb and tuber crops	I I Cole crops • Root crops • Peas and beans V Leafy vegetables

- **Theory**

Introduction, commercial and nutritional importance, origin and distribution, botany and taxonomy, area, production, productivity and constraints, soil requirements, climatic factors for yield and quality, commercial varieties/hybrids, seed rate and seed treatment, raising of nursery, sowing/ planting time and methods, hydroponics and aeroponics, precision farming, cropping system, nutritional ingredients, micro nutrients and irrigation requirements, inter-cultural operations, special horticultural practices, weed control, mulching, role of plant growth regulators, physiological disorders, maturity indices, harvesting, yield, post-harvest management (grading, packaging and marketing), pest and disease management and production economics of crops.

### **Unit I**

*Bulb and tuber crops*—Onion, garlic and potato.

*Colecrops*—Cabbage, cauliflower, kohlrabi, broccoli, Brussels sprouts and kale.

### **Unit III**

*Root crops*—Carrot, radish, turnip and beetroot.

### **Unit IV**

*Peas and beans*—Garden peas and broad bean.

### **Unit V**

*Leafy vegetables*—Beet leaf, fenugreek, coriander and lettuce.

#### • **Practical**

- Scientific raising of nursery and seed treatment;
- Sowing and transplanting;
- Description of commercial varieties and hybrids;
- Demonstration of methods of irrigation, fertilizers and micronutrients application;
- Mulching practices, weed management;
- Use of plant growth substances in cool season vegetable crops;
- Study of nutritional and physiological disorders;
- Studies on hydroponics, aeroponics and other soilless culture;
- Identification of important pest and diseases and their control;
- Preparation of cropping scheme for commercial farms;
- Visit to commercial farm, greenhouse/polyhouses;
- Visit to vegetable market;
- Analysis of benefit to cost ratio.

#### • **Teaching Methods/Activities**

- Classroom lectures
- Assignment (written and speaking)
- Student presentation
- Hands-on training of different procedures
- Group discussion

#### • **Learning outcome**

After successful completion of this course, the students are expected to:

- Appreciate the scope and scenario of cool season vegetable crops in India
- Acquire knowledge about the production technology and post-harvest handling of cool season vegetable crops
- Calculate the economics of vegetable production in India

#### • **Suggested Reading**

Bose TK, Kabir J, Maity TK, Parthasarathy VA and Som MG. 2003. *Vegetable crops*. Vols. I-III. Nayaudyog.

Bose TK, Som MG and Kabir J. (Eds.). 1993. *Vegetable crops*. Naya prokash.

Chadha KL and Kalloo G. (Eds.). 1993-94. *Advances in horticulture* Vols. V-X. Malhotra publ. house.

Chadha KL. (Ed.). 2002. *Handbook of horticulture*. ICAR.

Chauhan DVS. (Ed.). 1986. *Vegetable production in India*. Ramprasad and sons.

Fageria MS, Choudhary BR and Dhaka RS. 2000. *Vegetable crops: production technology*. Vol. II. Kalyani publishers.

Gopalakrishnan TR. 2007. *Vegetable crops*. New India publ. agency.

Hazra P and Banerjee MK and Chattopadhyay A. 2012. *Varieties of vegetable crops in India*, (Second edition), Kalyani publishers, Ludhiana, 199p.

Hazra P. 2016. *Vegetable Science*. 2<sup>nd</sup> edn, Kalyani publishers, Ludhiana.

Hazra P. 2019. *Vegetable production and technology*. New India publishing agency, New Delhi.

Hazra P, Chattopadhyay A, Karmakar K and Dutta S. 2011. *Modern technology for vegetable production*, New India