

Agriculture Science and Technology (75)

Introduction

Agriculture is the back bone of countries development, as more than 65 % Indian population living in the rural area is mainly dependant on agriculture and the related fields. Hence, development of agriculture is the only way to improve the economic status of the rural population. Besides, agriculture has the potential to nourish the ever increasing population provided the productivity and production of the various crops is increased substantially.

It is the need of the hour to strengthen agricultural education and extension activity for the benefit of the farming community through the inclusion of agriculture subjects to the 10 + 2 students or technicians. As majority of the school going children belong to villages, they are expected to acquire knowledge of improved techniques in agriculture easily.

Objectives

To enable the students to

1. acquire knowledge of different soil forming rocks and soil formation procedure.
2. know the properties of soil, soil types and soil management practices.
3. understand different agricultural practices for maintenance of soil fertility and productivity.
4. understand different factors of crop production.
5. know the use of farm waste for soil improvement.
6. study the dry land farming and watershed management.
7. understand the cultivation of important field crops, fruits, vegetables and floriculture crops.
8. know the improved technology like hybridization, tissue culture, polyhouse, farm mechanization etc.
9. study climate in relation to plant growth.
10. acquire knowledge about weed, pest and disease management.
11. develop the skill in using various agricultural appliances.
12. study management practices for sustainable agriculture.
13. develop the habits of working in field conditions.
14. know the extension teaching methods and aids.
15. appreciate and honour the work of farming community.

Std. XI : Theory

1. **Introduction to Agronomy and Crop Production**
 - 1.1 Agronomy
 - 1.2 Crop production
2. **Rocks and minerals**
 - 2.1 Meaning of rock
 - 2.2 Types of rocks
 - 2.3 Study of minerals
 - 2.4 Weathering of rocks
3. **Soil**
 - 3.1 Meaning
 - 3.2 Functions
 - 3.3 Soil formation
 - 3.4 Properties of soil
 - 3.5 Soil fertility and productivity



- 3.6 Soils of Maharashtra
4. **Weather and climate**
- 4.1 Different weather elements
- 4.2 Instruments of measurement
- 4.3 Weather forecasting
5. **Plant morphology and physiology**
- 5.1 Study of different plant parts viz. root, stem, leaf and flower
- 5.2 Plant physiology
6. **Tillage and farm operations**
- 6.1 Definition
- 6.2 Objectives
- 6.3 Types
- 6.4 Tillage implements
- 6.5 Modern concepts
- 6.6 Farm operations
7. **Seed and sowing**
- 7.1 Meaning
- 7.2 Difference between seed and grain
- 7.3 Characteristics of seed
- 7.4 Parts of seed
- 7.5 Seed technology
- 7.6 Seed multiplication
- 7.7 Seed treatment
- 7.8 Sowing methods
- 7.9 Sowing time, depth and spacing
8. **Seed testing**
- 8.1 Objectives
- 8.2 International Seed Testing Association
- 8.3 Seed germination
- 8.4 Seed dormancy
- 8.5 Different seed tests
9. **Plant protection**
- 9.1 Pest and diseases
- 9.2 Control methods
- 9.3 Integrated pest management
- 9.4 Integrated disease management
- 9.5 Study of important pests
- 9.6 Study of important diseases
10. **Weed management**
- 10.1 Meaning
- 10.2 Characteristics
- 10.3 Classification
- 10.4 Effects of weeds
- 10.5 Dispersal of weeds
- 10.6 Weed control
11. **Crop rotation and cropping scheme**
- 11.1 Crop rotation
- 11.2 Cropping scheme
12. **Dryland agriculture**
- 12.1 Meaning and classification
- 12.2 Characteristics of dry land agriculture
- 12.3 Water shed management
- 12.4 Water harvesting
- 12.5 Contingency planning
- 12.6 Sustainable agriculture
13. **Study of different crops**
- 13.1 Cereals and pulses: Jowar and bajra, gram and red gram
- 13.2 Importance of vegetables
- 13.3 Classification of vegetables
- 13.4 Study of vegetables – potato, brinjal, chilli, okra, cabbage, onion, spinach and cucumber
14. **Agricultural economics**
- 14.1 Introduction to basic concepts
- 14.2 Agricultural costing
- 14.3 Cost of cultivation
- 14.4 World Trade Organization (WTO)
- 14.5 Awareness in purchasing agricultural inputs.
- Practicals**
- Std. XI**
1. Identification of important rocks.
 2. Identification of seeds of different crops, manures and fertilizers.
 3. Study of soil profile and different types of



- soils.
4. Handling and use of different tillage implements and plant protection equipments.
 5. Seed treatment for the crops included in the syllabus.
 6. Study of meteorological equipments.
 7. Visit to a meteorological observatory.
 8. Study of different types of weeds and herbicides.
 9. Practice of seed bed preparation.
 10. Determination of physical purity of seed.
 11. Visit to a seed processing plant and seed testing laboratory.
 12. Methods of sowing for different crops.
 13. Collection and preparation of soil sample for analysis.
 14. Visit to a soil testing laboratory.
 15. Demonstration of spraying of insecticides, pesticides and herbicides.
 16. Study of cropping schemes.

Project work

Note : Students may be given choice to do any one of the project work listed below.

1. Collection of weeds and preparing an album with brief information.
2. Collection of seeds and preparing an album with brief information.
3. Collection of samples of different soils with brief information.
4. Preparation of any one model of tillage implements.

Std. XII : Theory

1. Plant nutrition

- 1.1 Essential elements
- 1.2 Classification
- 1.3 Functions
- 1.4 Deficiency symptoms

- 1.5 Integrated nutrient management
2. **Manures and fertilizers**
 - 2.1 Meaning
 - 2.2 Classification
 - 2.3 Study of organic manures
 - 2.4 Green manuring
 - 2.5 Vermicompost
 - 2.6 Bio-fertilizers
 - 2.7 Organic farming
 - 2.8 Chemical fertilizers
 - 2.9 Time and methods of application
3. **Irrigation and drainage**
 - 3.1 Meaning of irrigation
 - 3.2 Advantages and adverse effects
 - 3.3 Systems of irrigation
 - 3.4 Scheduling of irrigation
 - 3.5 Meaning of drainage
 - 3.6 Importance of drainage
 - 3.7 Causes of improper drainage and remedies
4. **Cropping systems**
 - 4.1 Meaning
 - 4.2 Study of different cropping systems
5. **Plant breeding**
 - 5.1 Introduction to plant breeding
 - 5.2 Objectives
 - 5.3 Activities in plant breeding
 - 5.4 Modes of reproduction
6. **Seed production technology**
 - 6.1 Principles of seed production
 - 6.2 Seed act
 - 6.3 Hybrid seed production of jowar
 - 6.4 Hybrid seed production of cotton
7. **Study of field crops**
 - 7.1 Cash crops : Cotton and sugarcane
 - 7.2 Cereals and oilseeds : Paddy, wheat, soybean and groundnut
 - 7.3 Fodder crops : Lucerne, berseem, jowar, maize



8. Fundamentals of horticulture

- 8.1 Scope, importance and limitations of fruit growing in India
- 8.2 Importance of fruits in human diet
- 8.3 Planning of fruit orchard
- 8.4 Special horticultural practices

9. Cultivation of horticultural crops

- 9.1 Cultivation of fruit crops : Mango, grape, banana, santra, pomegranate
- 9.2 Cultivation of fruit crops (in brief) : Ber, guava, custard apple, chikoo, coconut, cashewnut and papaya
- 9.3 Cultivation of flower crops : Rose, tuberose, marigold, chrysanthemum

10. Fruit preservation

- 10.1 Principles
- 10.2 Methods of preservation
- 10.3 Preparation of preserved products viz. jam, jelly and pickles.

11. Advanced technologies in agriculture

- 11.1 Scope and importance of bio-technology
- 11.2 Plant tissue culture
- 11.3 Genetic manipulation technique
- 11.4 Polyhouse culture
- 11.5 Farm mechanization

12. Agricultural extension

- 12.1 Meaning
- 12.2 Objectives
- 12.3 Formal and extension education
- 12.4 Extension teaching methods
- 12.5 Teaching aids
- 12.6 New communication technologies

Practicals : Std. XII

1. Study of various systems of irrigation.
2. Study of calculation of theoretical seedrate required for different crops.
3. Calculations regarding plant population.
4. Study of calculation of doses of fertilizers for different crops.
5. Raising of seedlings of flowers and fruits.
6. Practice of filling containers for pot culture.
7. Preparation of crop-cafeteria and practice of sowing, planting, transplanting, interculturing and harvesting.
8. Practice of training and pruning.
9. Study of asexual methods of propagation viz. cutting, layering, budding and grafting.
10. Study of methods of fertilizer application.
11. Seedbed preparation for different crops included in syllabus.
12. Visit to a tissue culture laboratory.
13. Visit to a nursery and polyhouse.
14. Emasculation and pollination in cotton.
15. Preparation of extension teaching aids.

Project work

Note : Students may be given choice to do any one of the project work listed below.

1. Collection of manure and fertilizer samples and preparing an album with brief description.
2. Collection of pest samples along with brief information regarding its name, nature of damage and control measures.
3. Collection of disease samples along with brief information regarding its name, symptoms and control measures.
4. Collection of samples regarding visual aids used in extension teaching.

