Introduction

Agriculture is the backbone 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.
7. Visit to a meteorological observatory.
8. Study of different types of weeds and herbicides.
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.
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
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 biotechnology
    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.
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.
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.

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