

1. Introduction

- 1.1. History, impact and importance of crop research and development programs
- 1.2. Agricultural perspective plan and its priority in food security
- 1.3. Major constraints of agricultural production in Nepal
- 1.4. Prospects of commercial field and plantation crops for commercialization

2. Crop Production and Its Management

(Major Cereal crops, pulses, cash crops) in relation to

- 2.1. Introduction, Origin and Distribution
- 2.2. Botany, Physiology, Morphology and Growth stages of Crop Plant
- 2.3. Climate and Soil
- 2.4. Recommended Varieties and their Characteristics
- 2.5. Cultivation Practices: land preparation, seed rate, and seed treatment, planting methods, planting time, intercultural operations
- 2.6. Manure's and Fertilizers: recommended doses, method of application, time of application etc.
- 2.7. Water Management: critical stages of water requirement, time and frequency of water application, irrigation methods and drainage prevalent
- 2.8. Plant Protection Measures: important diseases, insect pests prevalent in Nepal and their control measure / IPM practices
- 2.9. Post Harvest Practices and Handling

3. Weather and crops

- 3.1. Climate-Temperature, Humidity, Rainfall, Sunshine Hours, Soil Temperature and their effects on crops
- 3.2. Agro climatic Zones, Seasonal Patterns in relation to crops of Nepal
- 3.3. Effects of Drought, Floods, Cold, Frost Hailstones and Wind on Crop Production

4. Land Resources and Tillage

- 4.1. Physiographic Distribution and Land System in Nepal
- 4.2. Land capability and Irrigation suitability
- 4.3. Land utilization
- 4.4. Soil classification and its relationship with tillage practices
- 4.5. Zero Tillage, minimum tillage and optimum tillage
- 4.6. Terrace and Terrace management

5. Biodiversity & Agro biodiversity

- 5.1. Convention on Biodiversity (CBD)
- 5.2. Role of IPGRI in conservation of agro-biodiversity
- 5.3. Plant variety protection in relation to WTO
- 5.4. Himalayan Region as a centre of crop plants origin and diversity
- 5.5. Biodiversity and approaches for its utilization and conservation

6. Soil and Plant Nutrition Management

- 6.1. Importance of Top Soil and Sub Soil's
- 6.2. Soil of Nepal and their classification

- 6.3. Chemical Properties of Soil
- 6.4. Essential Plant Nutrients and their sources
- 6.5. Organic Manuring
 - 6.5.1 Organic Manures- Application/Sources
 - 6.5.2 Plants suitable for green manuring
 - 6.5.3 Desirable characteristics of green manuring crops
 - 6.5.4 Constraints of organic manuring
 - 6.5.5 Sources of organic manures
 - 6.5.6 Organic crop production in the present scenario

7. Water Management in Crop Production

- 7.1. Irrigation potential in Nepal
- 7.2. Water requirement of different crops
- 7.3. Quality of irrigation water, methods and technique of irrigation
- 7.4. Some alternative irrigation practices presently in use
- 7.5. Drainage methods
- 7.6. Available water resources
- 7.7. Integrated crop and water management

8. Weeds & weed control

- 8.1. Classification of weeds, effects on crop production
- 8.2. Common weeds found in major field crops
- 8.3. Principles and methods of weed control practices in Nepal
- 8.4. Herbicides: type, formulation, and mode of action, effects and its use in Nepal
- 8.5. Herbicidal effects on environment and its economic use

9. Genetics & Plant Breeding

- 9.1. Advances in crop improvement in Nepal.
- 9.2. Definition, importance, history and achievement of plant breeding
- 9.3. Genetic basis of plant breeding
- 9.4. Breeding methods: self pollinated & cross pollinated crops
- 9.5. Varietal improvement procedure adopted in Nepal
- 9.6. Use of biotechnology in plant breeding

10. Seed Technology

- 10.1. Principles and practices of seed production
- 10.2. Seed classification and their qualities
- 10.3. Physiology of seed
- 10.4. Seed certification procedures and seed certification standards of major crops
- 10.5. Seed regulatory agency and its function in controlling and maintenance of seed standards
- 10.6. Seed self sufficiency program, its importance and present status

11. Crop Physiology

- 11.1. Growth & development
- 11.2. Photoperiodics
- 11.3. Photosynthesis and respiration.
- 11.4. Transpiration
- 11.5. Absorption & translocation

11.6. Stress physiology: cold & heat stress, low & high moisture stresses, etc.

12. Sustainable Agriculture & Farming System

- 12.1. Definition of sustainable agriculture
- 12.2. Problem of modern agriculture system
- 12.3. Importance of green revolution
- 12.4. Technology generation and its sustainability
- 12.5. Importance of indigenous technology
- 12.6. Farming system approach and its components
- 12.7. Social, economic & institutional aspects of farming system
- 12.8. Gaps in agronomy research & development
- 12.9. Suggestion to strengthen sustainability in agriculture
- 12.10. Gender issues in agronomic practices

13. Biometrics

- 13.1. Concept and fundamental parameter of statistics
- 13.2. Proper plot technique and data analysis
- 13.3. Estimate and control of error-replication, blocking and randomization
- 13.4. Concept and use of different design used agriculture
- 13.5. Use of computer statistical packages in agronomy research and development