

DEPARTMENT OF AGRONOMY

AGRO 103

Credits 3(2+ 1)

Principles of Agronomy and Agricultural Meteorology

Theory

Agriculture - Agronomy, its relationship with basic sciences. Agricultural development in India, Telangana Agro-climatic zones in India and Telangana Major Constraints limiting crop production in different Agro-climatic zones of Telangana.

Tillage and Tillage, sowing, crop stand establishment, plant geometry and plant density and their effect on growth and yield. Indices for evaluating productivity and efficiency.

Agro meteorology - weather and climate, monsoon, clouds, weather aberrations, disaster management, weather modification and microclimate. Weather forecasting and its utility. Remote sensing. Climate classification, and climate change, crop-weather relationship and crop growth modeling.

Practicals

1. Study of tillage implements
2. Ploughing practice in the field
3. Puddling practice in the field
4. Study of seeding equipment and demonstration of sowing practice
5. Identification of manures, fertilizers, study of nutrient management practices (time and method of application etc)
6. Identification of green. manure crops, green leaf manures, study and practice of bullock drawn and tractor drawn implements in the field
7. Intercultivation implements and their practice in field crops
8. Visit to a commercial farm
9. Measurement of solar radiation in crops
10. Measurement of air temperature in crops
11. Measurement of soil temperature in crops
12. Measurement of wind in crops
13. Measurement of humidity in crops
14. Estimation of evaporation by using weather elements - Reading of weather maps
15. Visit to Agro meteorological Meteorological observatory
16. Study of synoptic charts and symbols

References

1. Principles of Agronomy Yelamanda Reddy T and Sankara Reddy G H 1995. Kalyani Publishers, Ludhiana
2. Introduction to Agronomy and Soil water management Vaidya V G and Shasrabudde K R 1979. Continental Prakashnam, Pune
3. Principles of Agronomy Mudaliar V T S Revised by Sankaran S 1991. Bangalore Printing and Publishing Company, Bangalore
4. Principles of Agronomy Reddy S R 1999. Kalyani Publishers, Ludhiana .
5. Principles and Practices of Agronomy Climatology Chaitanya Publilshing House, Allahabad
6. Climatology Singh S S 1998. Kalyani Publishers, Ludhiana Lal D S 1986.
7. Meteorology Ghadekar S R 1991. Agromet Publishers, Nagpur
8. Basic Principles of Agricultural Meteorology Radha Krishna Murthy V 2003, B.S. Publications, Hyderabad.
9. Climate, Weather and Crops Lenka D Kalyani Publishers, 2000. Second Edition, New Delhi

AGRO 204

Credits 3(2 + 1)

Rainfed Agriculture and Watershed Management

Theory

Introduction and Definition. Rainfall in India and Telangana. Types of rainfall aberrations and their impact on soil, Soil moisture and crop production. Probability estimates of rainfall. Identification of suitable crops, varieties and cropping systems for different soils in different agro-climatic zones of Telangana Contingency crop planning. Drought management. Fertilizer use in dry lands. Soil erosion and soil moisture conservation

Watershed management - objectives and approaches for soil and water conservation. Watershed Development Programmes. Land use capability classification. Water harvesting and life saving irrigation for better crop production. Alternate land use systems.

Practicals

1. Allotment of plots and preparation of seedbed
2. Fertilizer application and sowing
3. Rainfall analysis and interpretation
4. Study of dry farming Implements
5. Study of agronomic measures of soil and moisture conservation
6. Demonstration of land treatments for moisture conservation
7. Evaluation of treatment effects on moisture conservation
8. Periodical collection of biometric data on raised crop and its interpretation
9. Visit to watershed of any Dry land Institute
10. Study of drought effects on crops
11. Field exercise to take up mid season crop corrections
12. Study of methods to alleviate drought
13. Study of erosion resistant and erosion permitting crops
14. Methods of improving fertilizer use efficiency in dryland crops
15. Estimation of yield in important dryland crops
16. Harvesting, post harvesting operations and recording of yield

References

1. A New Technology for Dry land Farming ICAR 1970. ICAR, New Delhi
2. Crop Production in dry Regions - Vol-I. Arnon 1972. Leonard Hill Publishing Company, London
3. Physiological Aspects of Dry land Farming Gupta U S 1975. Oxford & IDH Publishers Company Limited, New Delhi
4. Dry land Agriculture in India Mohd. Shahid & Mehdi Raja 1987. Rawat Publications, Jaipur
5. Dry land Farming Perspectives and Prospects Sharma BL 1991 . Daya Publishing House, New Delhi
6. Dry land Agriculture State of Art of Research in India Somani L L Vittal K D R & Venkateswarlu B 1992. Scientific Publishers, Jodhpur
7. Watershed management in India Murthy J V S 1994. Wiley Eastern Publishers, New Delhi

Production of Cereals, Pulses and Fodder Crops**Theory**

Agronomy of Crops - Introduction, origin, area, production and productivity, soils, climate, season, crop varieties, seeds and sowing, fertilizers, irrigation, weed management, cropping systems, harvesting, threshing, uses, quality, export potential and marketing of Cereals - rice, wheat, maize, sorghum, pearl millet; Pulses - redgram, greengram, blackgram, bengalgram - Fodder crops - hybrid napier, guinea grass, paragrass, lucerne, berseem, anjan grass.

Practicals

1. Preparation of individual plots for cultivation of crops
2. Preparation of seed material
3. Preparation of hay/silage
4. Fertilizer application and sowing
5. Recording data on seedling emergence
6. Gap filling
7. Thinning
8. Intercultivation and weeding
9. Recording biometric observations
10. Harvesting and recording yield data
11. Compilation of data and interpretation of results
12. Visit to crop and forage Cafeteria for identification
13. Field visit to ICAR Institutes/ICRISAT
14. Visit to farmers fields and identification of constraints
15. Visit to forage production farm
16. Visit to processing units

References

1. Advances in pulse production technology Jeswani & Baldev 1990. ICAR, New Delhi
2. Fundamentals of Cereal crop production Mahendrapal & Jayanta Deka 1996. McGraw Hill Publishers, New Delhi
3. Science of Field crop production Gururaj Singh Huusigi & Krishna K R 1998. Oxford Publishers, New Delhi
4. Text book of field crop production Rajendra Prasad 2002. ICAR, New Delhi.
5. Forages production in India Singh P 1986 Range management Society of India IGFRI, Jhansi
6. Forage crops & grasses Relwani L L 1979. ICAR, New-Delhi
7. Forage crops of India Narayanan T R and Dabadghao PM 1972. ICAR, New Delhi

AGRO 304

Credits 3(2 + 1)

Production of Oilseeds and Commercial Crops

Theory

Agronomy of crops - Introduction, origin, area, production and productivity, soils, climate, season, seeds and sowing, fertilizers, irrigation, weed management, cropping systems, harvesting, threshing, uses, quality, export potential-and marketing of Oilseeds - groundnut, rapeseed and mustard, soybean, sunflower, sesame, safflower and castor and commercial crops - cotton, jute, mesta, sugarcane and tobacco.

Practicals

1. Allotment of individual plots for cultivation of crops
2. Seed material preparation
3. Seed bed preparation
4. Fertilizer application and sowing
5. Observations on field emergence of seedlings
6. Gap filling
7. Thinning
8. Intercultivation and weeding
9. Recording biometric observations

10. Harvesting and recording yield data
11. Compilation of data and interpretation of results
12. Identification of plant and seed material of various crops
13. Estimation of yield in various crops
14. Visit to farmers fields
15. Visit to processing units
16. Visit to nearby sugar factory

References

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| 1. | Tobacco | Gopalachari N C 1984. ICAR, New Delhi |
| 2. | Groundnut | Reddy P S 1988. ICAR, New Delhi |
| 3. | Sugarcane | Babu C N 1990. Allied Publishers Limited, New Delhi |
| 4. | Modern Techniques of raising field crops | Chidda Singh 1993. Oxford & IBH Publishing Company, New Delhi |
| 5. | Agronomy of Sugarcane - Principles and Practices | Yadava R L 1993. International Book Distribution Company, Lucknow |
| 6. | Efficient Management of Dry land Crops in India - Oilseeds | Singh R P Reddy P S and Kiresur V 1997. Indian Society of Oilseeds Research, D.O.R., Hyderabad |
| 7. | Science of Field Crop Production | Gururaj Singh Hunsigi and Krishna K R 1998. Oxford Publishers, New Delhi |
| 8. | Text Book of Field Crops Production | Rajendra Prasad 2002. ICAR, New Delhi |

AGR0402

Credits 3(2 + 1)

Irrigation Water Management

Theory

Water resources of India and Telangana. Irrigation development in India and Telangana. Soil-plant-water relationships. Evapotranspiration and crop requirement. Effective rainfall. Measurement of irrigation water and scheduling irrigation. Irrigation efficiency and water use efficiency. Conjunctive use of water. Irrigation water quality and its management. Agricultural drainage. Uses of wastewater for irrigation.

Water production functions and their application in irrigation water management. Water management practices for principal field, vegetable and fruit crops.

Practicals

1. Determination of bulk density and infiltration rate for different soils
2. Determination of soil moisture content by gravimetric method
3. Determination of soil moisture content by volumetric method
4. Installation and working of tensiometer
5. Installation and working of gypsum blocks
6. Measurement of soil moisture by neutron moisture meter
7. Determination of field capacity by field method
8. Determination of permanent wilting point by field method
9. Scheduling of irrigation by soil-cum-sand mini plot technique
10. Scheduling of irrigation by IW /CPE ratio method
11. Calculation of irrigation water needs (problems)
12. Measurement of plant water status
13. Calculation of effective rainfall & Duty of water
14. Layout of surface methods of irrigation
15. Demonstration of sprinkler and drip irrigation
16. Installation and operation of water control devices

References

1. Irrigation - Principles & Practices Israelsen O W and Hansen V E 1962. John Wiley & Sons, U.S.A.
2. A practical manual for water use Research Dastane N G 1967. Navbharat Publications, Poona
3. Water requirement of Crops in India Monograph 41977. I.A.R.I., New Delhi.
4. Irrigation - Theory and Practice Michael A M 1978. Vikas Publishing House Private Limited, Ghaziabad, U.P.
5. Manual on Irrigation Agronomy Misra R D and Ahmed M 1988. Oxford & IBH Publishing Company Limited, New Delhi
6. Efficient use of irrigation water Reddy G H S and Reddy T Y 1995. Kalyani Publishers, New Delhi

Sustainable Agriculture**Theory**

Sustainable Agriculture - Introduction, definition, goal and current concepts. Factors effecting ecological balance and ameliorative measures. Land degradation. Irrigation problems. Indiscriminate use of agrochemicals. Environmental pollution - Greenhouse effect, depletion of ozone layer, methane emissions, erosion of genetic biodiversity. Conjunctive use of water. Wastelands and their development. Sea water inundation and sand casting during cyclonic storms - ameliorative measures. Organic farming- definition, principles, relevance to modern agriculture.

Biological control - IPM, biopesticides and bioherbicides. Green manure crops and INM, Farming Systems - IFS models for wetland, irrigated dry land and dry land situations.

Practicals

1. Preparation of cropping scheme for irrigated situations
2. Preparation of cropping scheme for dryland situations
3. Preparation of integrated farming system model for wetlands
4. Preparation of integrated farming system model for irrigated - dry conditions
5. Preparation of integrated farming system model for dryland conditions
- 6 & 7. Preparation of enriched FYM
- 8 & 9. Preparation of vermicompost
10. Study of preparation of biofertilizers
11. Visit to recycling of urban waste unit and economics
12. Study of profitable utilization of agricultural wastes
- 13 & 14. Visit to a poultry and dairy farming unit to study resource allocation, utilization and economics
15. Visit to an organic farm to study various components application and utilization
16. Visit to command area to study and analyse irrigated related problems

References

1. Farming Systems in the Tropics Rangaswamy A Annadurai K Subbaiah P and Jayanthi Chinnuswamy, 2002. Kalyani Publishers, New Delhi
2. Organic Farming - Theory & Practice Palaniappan S P & Annadurai K1999. Scientific Publishers, Jodhpur
3. Proc. of International Symposium on Natural Resource Management for Sustainable Agriculture (Vol-I&II) Indian Society of Agronomy, 1990 IARI, New Delhi
4. Natural Resource Management for Sustainable Agriculture and Environment Deb DH. 1984. Angkor Publishers, New Delhi
5. Organics in soil health and crop production Thampan P K 1983. Peekay Tree Crops Development Foundation, Cochin