21AGRO303 RAINFED AGRICULTURE AND WATERSHED MANAGEMENT

Source:
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Hours Per Week :

L	T	P	C
1	-	2	2

Total Hours :

L	T	P
15	-	30

Course Description and Objectives:

This course makes the student aware about the concept of rainfed agriculture, risks and opportunities associated with rainfed agriculture and the role of integrated watershed management in managing water scarcity and sustainable crop production

Course Outcomes:

Upon completion of the course, the student will be able to achieve the following outcomes:

COs	Course Outcomes
1	Acquire knowledge about planning and management of rainfed agricultural systems with due consideration to climate uncertainties
2	Able to identify the Soil and climatic conditions prevalent in rainfed areas
3	Skills to plan and implement integrated watershed development programs to manage rain fed dry lands profitably and sustainably

SKILLS:

- ✓ *Surveying and preparation of watershed map*
- ✓ *Watershed investigations for planning and development*
- ✓ *Water budgeting for watershed*
- ✓ *Suggest suitable crops for rain fed agriculture*
- ✓ *Classify the land based on distribution of annual rainfall*

ACTIVITIES:

- *Prepare plan and calculate economics for establishment of watershed*
- *Prepare cropping patterns suitable for different dry land areas*
- *Practice soil moisture conservation practices*
- *Field demonstration on construction of water harvesting structures*
- *Visit to rain fed research station / watershed*

UNIT - 1

Rainfed agriculture: Introduction, types, History of rainfed agriculture & watershed management in India

UNIT - 2

Problems and prospects: Problems and prospects of rainfed agriculture in India; Soil and climatic conditions prevalent in rainfed areas

UNIT - 3

Drought – definition – types of drought – effect of water deficits on physio-morphological characteristics of the plants- mechanism of crop adaptation under moisture deficit condition - management strategies for drought. Strategies for drought management. Contingency planning

UNIT - 4

Management of crops in rainfed areas: Agronomic measures of soil and water conservation – choice of crop – crop geometry – tillage – contour cultivation – strip cropping – cover cropping – mulching – cropping systems and weed control - Mechanical measures of soil and water management. Water harvesting (In situ, ex situ moisture conservation). Agronomic, mechanical methods of soil and water management

UNIT - 5

Watershed: definition – concept— objectives and principles of water shed management components of watershed development programme – factors affecting watershed management

LABORATORY EXPERIMENTS

LIST OF EXPERIMENTS

1. Climate classification.
2. Rainfall analysis - Mean, standard deviation, variance and CV
3. Onset and withdrawal of monsoons and determination of length of growing crop season
4. Study on cropping pattern of different dryland areas
5. Mapping of dryland areas in India
6. Interpretation of meteorological data for rainfall variability
7. Scheduling of supplemental irrigation based on crop ET demand
8. Critical analysis of rainfall and calculation of wet spells, dry spells and length of growing season
9. Calculation of effective rainfall. Determination of moisture availability index
10. Study of cultural practices for mitigating moisture stress (mulching, plant density, depth of sowing, thinning and leaf removal)
11. Visit to watershed
12. Field demonstration on soil & moisture conservation measures
13. Field demonstration of water harvesting structures
14. Study of farm ponds as a source of supplemental irrigation
15. Visit to rainfed research station

REFERENCES:

1. Reddy, S. R. and Prabhakar Reddy, G. 2015. Dryland Agriculture. Kalyani Publishers
2. Arnon, I. 1972. Crop Production in Dry Regions (Vol.I), Leonard Hill Pub. Co, London
3. Dhruva Narayana, V.V., Sastry, G.S. and Patnaiak, V.S. 1999. Watershed Management in India. ICAR, New Delhi
4. Jeevananda Reddy,S.2002. Dryland Agriculture in India: An agro-climatological and agro-meteorological perspective. B S publications