

22FMPE303 INTERCULTURAL, HARVESTING AND THRESHING EQUIPMENT

Hours Per Week :

L	T	P	C
2	0	2	3

PREREQUISITE KNOWLEDGE: Basics of intercultural, harvesting & threshing operation.

COURSE DESCRIPTION AND OBJECTIVES:

The objective of the study is to impart knowledge about machines / implements for plant protection, intercultural operation, harvesting and threshing.

MODULE-1

UNIT-1

8L+0T+8P=16 Hours

INTRODUCTION TO PLANT PROTECTION EQUIPMENT:

Sprayers and dusters. Classification of sprayers and sprays. Types of nozzles. Calculations for calibration of sprayers and chemical application rates. Introduction to interculture equipment. Use of weeders – manual and powered. Study of functional requirements of weeders and main components. Familiarization of fertilizer application equipment.

UNIT-2

8L+0T+8P=16 Hours

INTRODUCTION TO HARVESTING:

Study of harvesting operation – harvesting methods, harvesting terminology. Study of mowers – types, constructional details, working and adjustments. Study of shear type harvesting devices – cutter bar, inertial forces, counter balancing, terminology, cutting pattern.

PRACTICES:

- Familiarization with plant protection and intercultural equipment.
- Study of sprayers, types and functional components.
- Study of dusters, types and functional components.
- Calculations for chemical application rates.
- Study of nozzle types and spread pattern using patternator.
- Familiarization with manual and powered weeding equipment and identification of functional components.
- Study of fertilizer application equipment including manure spreaders and fertilizer broadcasters.

MODULE-2

UNIT-1

8L+0T+8P=16 Hours

STUDY OF REAPERS, BINDERS AND WINDROWERS:

Study of reapers, binders and windrowers – principle of operation and constructional details. Importance of hay conditioning, methods of hay conditioning, and calculation of moisture content of hay.

Introduction to threshing systems – manual and mechanical systems. Types of threshing drums and their applications. Types of threshers- tangential and axial, their constructional details and cleaning systems. Study of factors affecting thresher performance.



Source: <https://devette.nl/en/products/plant-protection-equipment>

SKILLS:

- ✓ Operate crop protection equipment.
- ✓ Perform calibration of sprayer.
- ✓ Perform intercrop operations.
- ✓ Operate harvesting.
- ✓ Compute the material losses in harvesting and threshing.
- ✓ Selection of suitable material handling system.

UNIT-2**8L+0T+8P=16 Hours****STUDY OF GRAIN COMBINES:**

Combine terminology, classification of grain combines, study of material flow in combines. Computation of combine losses, study of combine troubles and troubleshooting. Study of chaff cutters and capacity calculations. Study of straw combines – working principle and constructional details. Principle of operation, blade adjustment and approach angle, and calculation of material handled. Study of potato and groundnut diggers. Study of Cotton harvesting – Cotton harvesting mechanisms, study of cotton pickers and strippers, functional components. Study of maize harvesting combines. Introduction to vegetables and fruit harvesting equipment and tools.

PRACTICES:

- Study of various types of mowers, reaper, reaper binder.
- Study of functional components of mowers and reapers.
- Familiarization with threshing systems, cleaning systems in threshers.
- Calculations of losses in threshers.
- Familiarization with functional units of Grain combines and their types.
- Calculations for grain losses in a combine.
- Study of root crop diggers and familiarization with the functional units and attachments.
- Familiarization with the working of cotton and maize harvesters.
- Familiarization with vegetable and fruit harvesters.

COURSE OUTCOMES:

Upon successful completion of this course, students will have the ability to:

CO No.	Course Outcomes	Blooms Level	Module No.	Mapping with POs
1	Apply and application of practical knowledge to troubleshoot the machinery/implement problems.	Apply	2	1, 2, 9, 12
2	Apply, calculate material losses in harvesting and threshing operation.	Apply	2	1, 2, 9, 12
3	Evaluate and calibrate sprayer and dusters.	Evaluate	1	1, 2, 9, 12

TEXT BOOKS:

1. Jain S. C. and Grace Philip. "Farm Machinery – An Approach". Standard Publishers Distributors., New Delhi, 2010.

REFERENCE BOOKS:

1. Kepner, R. A., Bainer, R., and Barger, E. L." Principles of Farm Machinery".CBS Publishers and Distributors Pvt. Ltd., New Delhi, 2009.
2. Ojha, T. P. and Michael, A. M. "Principles of Agricultural Engineering Vol. I". Jain Brothers, New Delhi, 2006.
3. Sahay, J. "Elements of Agricultural Engineering. Standard Publishers and Distributors", New Delhi, 2015.
4. Yadav, R. and Solanki, H. B." Numerical and Short Questions in Farm Machinery, Power and Energy in Agriculture". New India Publishing Agency, New Delhi, 2009.