

FMPE 520 :

Pesticide Application Equipment**1 +1****Objectives:**

To make familiar with the different pesticides application equipments, based on hydraulic energy, gaseous energy, centrifugal energy, kinetic energy, and power etc; their components, working principles and their details for crop protection.

Unit I

Role of chemical control and formulations. Target, droplet size, its distribution and determination methods, selection of droplet size, atomizing devices-nozzles, types of sprayers, dusters and granular applicators, manually and power operated sprayers.

Unit II

Hydraulic energy, centrifugal energy, hybrid and air blast sprayers, pumps. Agitators, filters, pressure control devices and systems, manually and power operated dusters and granular applicators, fogging machines, aerial application of pesticides, application of pesticides in poly houses, application of pesticides with drone for field crops, calibration of sprayers.

Unit III

Design of spraying and dusting equipments, maintenance and selection of spraying equipments

Unit IV

Application methods and economics of pest control, safety precautions in pesticide application.

Practical:

Study of different types of sprayers, dusters, granular applications, fogging machines, nozzles, calibration of sprayers, selection of pesticides application equipment for field and orchard crops, weedicide application, performance, droplet size, maintenance of different sprayers

Teaching Schedule

Sr. No.	Topic	No. of lecture
1.	Role of chemical control and formulations	1
2.	Target for spraying	
3.	Importance of droplet size in pest management	
4.	Distribution of droplets on target	1

5.	Determination of droplet size methods, selection of droplet size	
6.	Atomizing devices-nozzles, types etc	1
7.	Types of sprayers, stirrup, hand operated knapsack, battery operated knapsack, compression, rocking sprayer etc	2
8.	Hydraulic energy, centrifugal energy, hybrid and air blast sprayers etc	1
9.	Components of sprayers, pumps, agitators, filters, pressure control devices and systems	1
10.	Manually and power operated dusters, Granular applicators, fogging machines etc	1
11.	Aerial application of pesticides	1
12.	Application of pesticides in poly houses	1
13.	Application of pesticides with drone for field crops	1
14.	Calibration of sprayers	3
15.	Design of spraying and dusting equipments and numerical	
16.	Maintenance and selection of spraying equipments	1
17.	Spray Application methods and economics of pest control	1
18.	Safety precautions in pesticide application	
	Total	16

List of Practicals

Sr. No.	Topic	No. of practicals
1	Study of manually Knapsack sprayer	1
2	Study of battery operated knapsack sprayer	1
3	Study of hand compression sprayer	1
4	Study of rocking sprayer	1
5	Study of rocking sprayer	1

6	Study of centrifugal energy sprayers	1
7	Study of air assisted sprayers	1
8	Study of power sprayers	1
9	Study of mist blower	1
10	Study of different types of dusters	1
11	Study of tractor operated boom sprayer	1
12	Study of fogging machine	1
13	To study the comparative performance of nozzles	1
14	Study the pressure, discharge relationship of different nozzles	1
15	Calibration of sprayer	1
16	Study maintenance of different sprayers	1
	Total	16

Suggested Reading:

1. G.A. Mathew. 1985. *Pesticide Application methods*, English language book society, Longman, Harlow, England
2. O.P. Bindra, H. Singh. 1980 *Pesticide application equipments*, Oxford & IBH publishing Co., New Delhi
3. R.A. Kepner, R. Bainer, E.L Barger. 2000. *Principles of Farm Machinery*. CBS Publishers and distributors, New Delhi
4. H. Bernacki, J. Haman Cz. Kanafojske. 1972. *Agricultural machines, theory and construction, Vol-I*, USDA Publications, Warsaw, Poland.
5. N.I. Klein, I.F. Popov and V.A. Sakun. *Agricultural Machines*, Amerind Publishing co. pvt. Ltd.
6. Ram Avtar, *Unmanned Aerial Vehicle: Applications in Agriculture and Environment*, Springer, e- book .(Link: <https://bit.ly/34xchDg>)