



# **SNS COLLEGE OF TECHNOLOGY**

**An Autonomous Institution  
Coimbatore – 35**

Accredited by NBA – AICTE and Accredited by NACC – UGC with 'A+ Grade  
Approved by AICTE , New Delhi and Affiliated to Anna University , Chennai.

## **DEPARTMENT OF AGRICULTURE ENGINEERING**

**19AG302 – FARM IMPLEMENTS AND MACHINERY**

**2020-21 BATCH - III YEAR V SEMESTER**

**UNIT IV. SOWING EQUIPMENT AND FERTILIZER APPLICATION  
TOPIC – L22 & 24- PLANTERS AND FERTILIZER CUM SEED DRILL  
PLANTERS FOR POTATO AND SUGARCANE**



# OBJECTIVES OF PLANTER



## PLANTER

Planter is a sowing equipment used for sowing those seeds which are larger in size and can not be handled by seed drills. Row to row and plant to plant spacing is maintained in a planter.

Potato planter, maize planter , cotton planter are popularly used.

Functions of a planter:

- (i) to open the furrow
- (ii) to meter the seed
- (iii) to deposit the seed in the furrow
- (iv) to cover the seed and compact the soil over the seed.



# COMPONENTS OF A PLANTER



**A planter consists of:**

- (i) hopper**
- (ii) feed metering device**
- (iii) knock out mechanism**
- (iv) cut-off mechanism**
- (v) furrow opener**
- (vi) furrow closer**
- (vii) Drive mechanism**
- (viii) clutch etc.**

**A planter has separate seed hopper for each row. Hopper is usually made of mild steel or any other suitable material.**



## SEED METERING DEVICE IN A PLANTER



There are a number of seed metering devices available for use in a planter. The most common device is a rotating circular plate with cells which is provided at the bottom of seed hoppers. In some planters, vertical rotors , inclined rotors , canvas belts are also used The circular seed plates have notches or holes provided along the periphery called cells which pick up the seeds from seed hopper and drop them in to the seed tube.

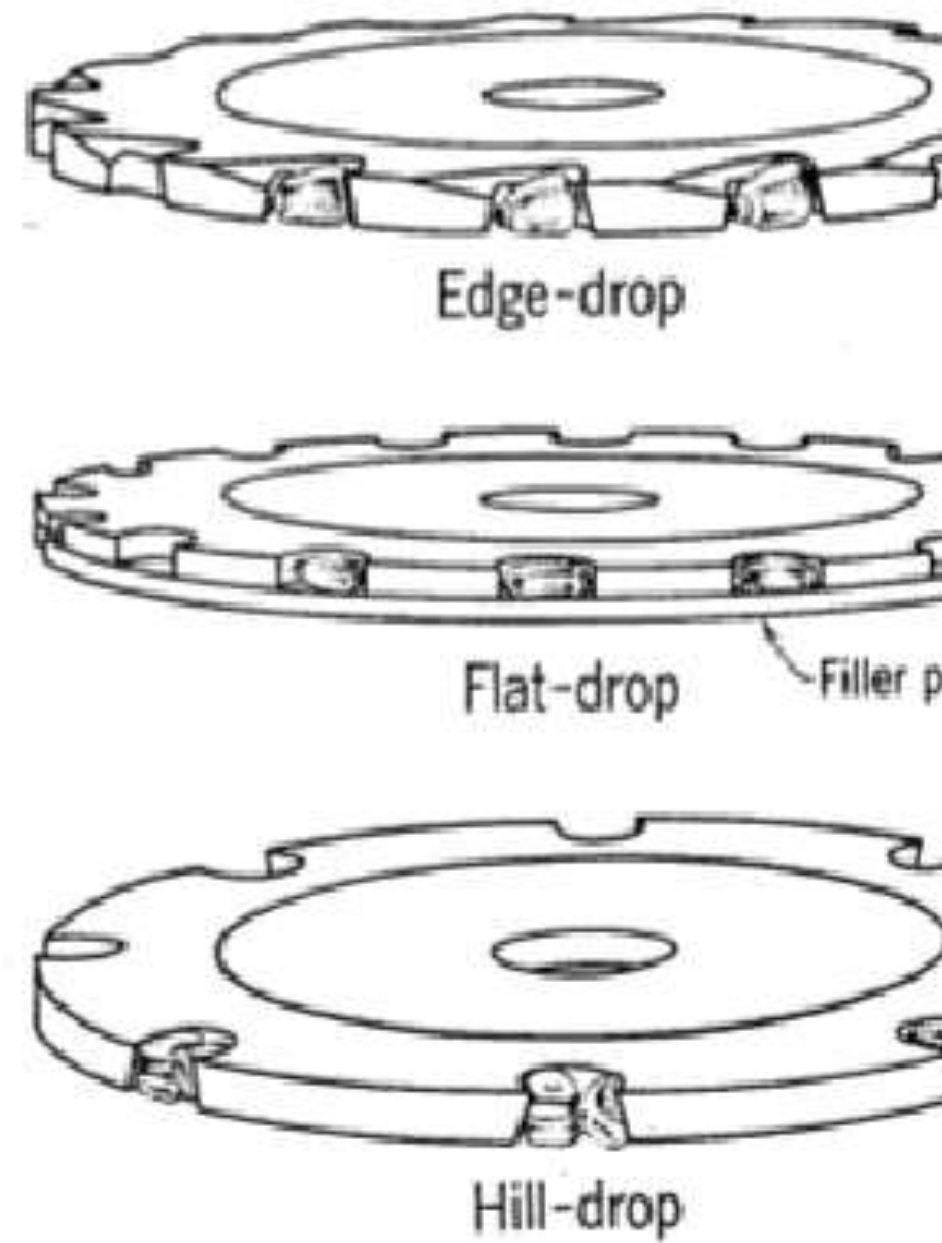


# TYPES OF ROTORS



- Depending upon the type of notches provided on the plates, the rotor is further classified in to.
  - (i) Edge drop
  - (ii) Flat drop and
  - (iii) Hill drop rotors.
- The cells carry the seeds in the cells of the rotor. The flat drop cell carries the seed on a platform of thickness half of the cell depth. Only one seed is allowed in the cell each time.
- In hill drop rotor, the cells are larger in size and admit many seeds at a time. The rotating plate receives the seeds from the hopper. The plate moves under an arrangement called cut-off which allows only those seeds which are accommodated in the cells.



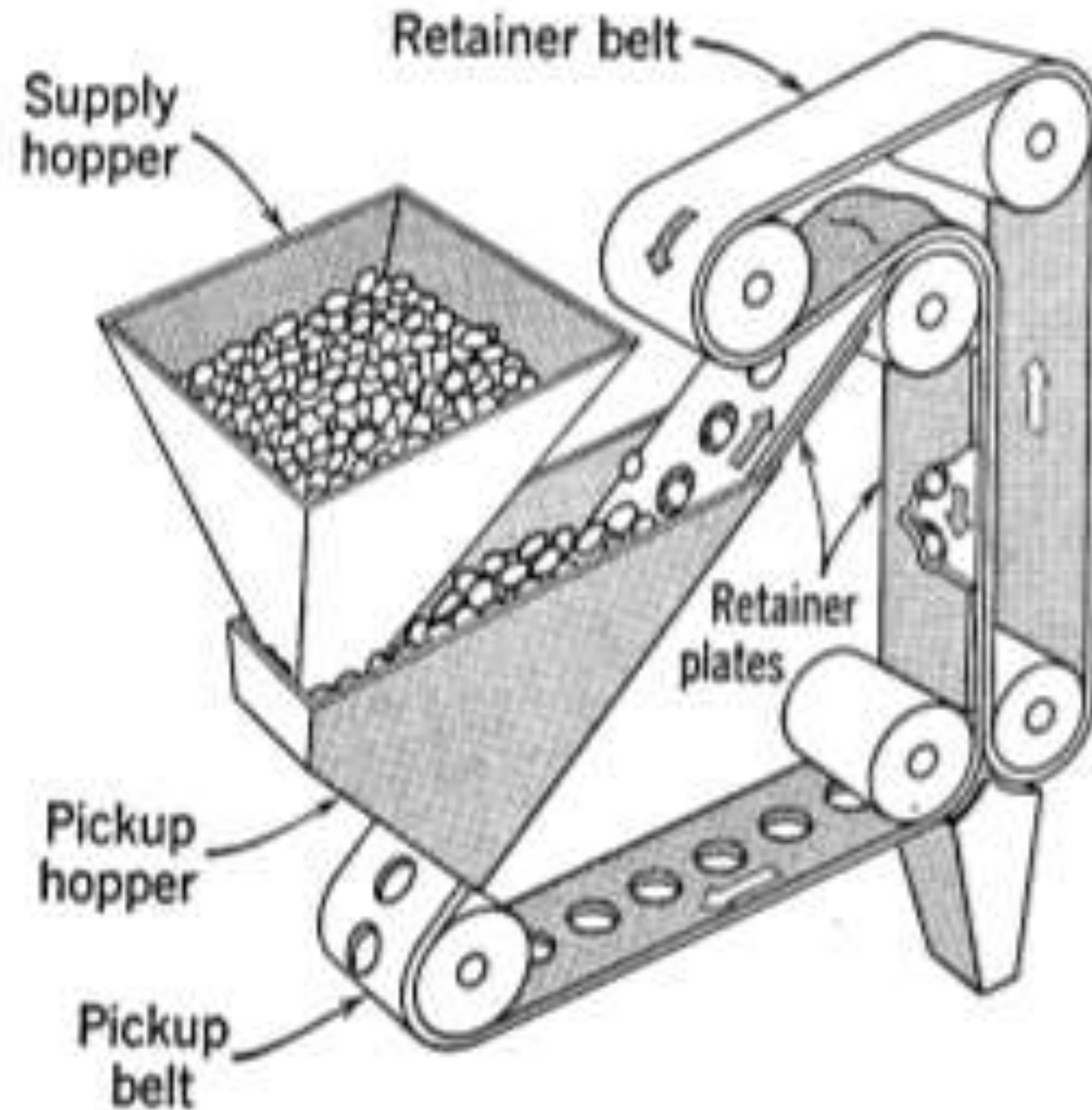


**LEFT : HOPPER BOTTOM FOR TYPICAL HORIZONTAL PLATE CORN PLANTER.**

**NOTE THE SPRING-LOADED (YIELDING) CUT-OFF A. AND THE SPRING-LOADED KNOCK-OUT PAWL B.**

**RIGHT : THREE TYPES OF EDGE-CELL PLATES USED INTERCHANGEABLY IN THIS HOPPER BOTTOM.**

**(INTERNATIONAL HARVESTER Co.)**



**EXPERIMENTAL BELT-TYPE PLANTER DEVELOPED FOR HIGH SPEED DRILLING OF SEEDS SUCH AS PEA-NUTS.**

**J.G.FUTRAL AND R.L.ALLEN, AGRIL. ENGG., APRIL, 1951.**



# CUT-OFF MECHANISM



- **Cut-off mechanism**
- It cuts-off or brushes out or removes the excess seeds carried away by the cells thus allowing corrected number of seeds for delivery.
- **Knock out mechanism:** It is a device which knocks out the seeds from the rotor cells . It consists of rollers or star wheels which by pressure releases the seeds from the cells. Seeds fall in to the seed tube and reach the furrow.
- **Spacing of seeds or hills:** The spacing of seeds or hills in the row is determined by the ratio of peripheral speed of the rotor to the forward speed of the planter and the spacing between the cells in the rotor.
- The accuracy of the planter depends upon several factors such as:
  - (i) speed of seed plate
  - (ii) shape and size of cells
  - (iii) shape of hopper bottom and
  - (iv) uniformity of seed size.





# SEED CUM FERTILIZER DRILL



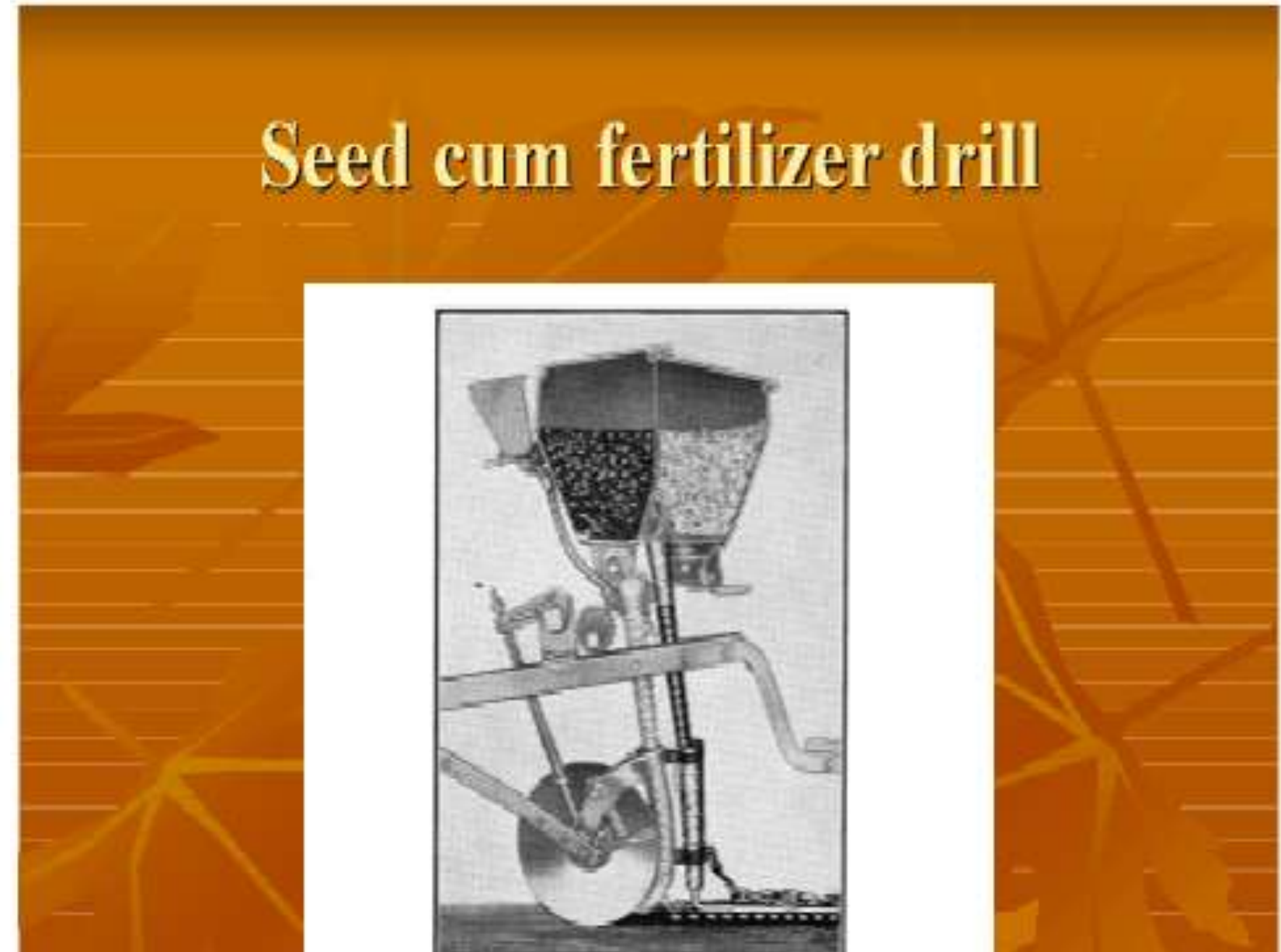
- Seed drills fitted with fertilizer dropping attachments are called seed-cum-fertilizer drills, They deliver both the seeds and fertilizers simultaneously in an acceptable pattern.
- Seed cum fertilizer drill has a large seed box which is divided lengthwise into two compartments, one for seed and another for fertilizers distribution.
- Functions of a seed cum fertilizer drill - Seed cum fertilizer drill performs the following functions :
  - i) To carry the seeds.
  - ii) To open furrows at uniform depths
  - iii) To meter the seeds
  - iv) To deposit the seeds in furrows in an acceptable pattern
  - v) To cover the seeds and compact the soil around the seed.
  - vi) To carry the seeds and fertilizer in separate compartments.
  - vii) To open furrows at uniform depths
  - viii) To meter the seeds and fertilizers
  - ix) To deposit the seed and fertilizer in the furrows in an acceptable pattern
  - x) To cover the seed and fertilizer and compact the soil around the seed.



# SEED CUM FERTILIZER DRILLS



**SEED CUM FERTILIZER DRILL**





# POTATO PLANTER



- Potato is an important crop in India. It requires a lot of labour for sowing in the fields. Potato planter have two types of potato dropping mechanisms namely i.) automatic and ii). Semi-automatic
- **POTATO PLANTER (AUTOMATIC SEED DROPPING)**
- The automatic potato planter consists of a hopper for each row and cups with chain drive mechanism. The graded potatoes are picked up by the cups and carried to furrow opener spout and released in the furrows. A feeder roller connected to the compensating tray which carrying spare potatoes checks up each cup. If a cup is found empty, a potato is released from compensating tray ensuring uniform seed spacing with no missing .The fertiliser and pesticide can also be placed simultaneously. It can plant in 2-4 rows. Capacity is 6000- 14000 potatoes /h





# POTATO PLANTER ( SEMI-AUTOMATIC)



- It is used for planting of potatoes.
- The semi automatic potato planter consists of a hopper , metering disc and furrow openers.
- The fertilizer application unit can be attached separately.
- The potatoes from the hopper are placed in the metering disc which contains several compartments. The metering disc is rotated by gear drive mechanism.
- The ridges are formed by the furrow openers .
- The potatoes drop in the furrows due to gravity.
- It may plant in 2-4 rows. Field capacity is 0.15-0.35 ha/h





# THREE ROW POTATO PLANTER







# SUGARCANE PLANTER



## I. Sugarcane planter

- This is a **tractor mounted** machine and can be drawn by any tractor of **35 hp**. This can be lifted or lowered by the hydraulic system of the tractor.

### Cane planting includes

- Planting of sugarcane in two rows.
- Opening of furrows at a spacing of 75 cm.
- Cutting of cane into 37 cm long setts
- Placement of setts in the furrows
- Dropping of fertilizer below the setts
- Dispensing the insecticide solution over the setts
- Covering the setts with soil and providing light compaction to minimise sett and soil moisture loss
- **Advantages:**
  - Irrigation water saving: 20- 30%
  - Seed Saving: Fertilizer Saving - 40%
  - Full yield of sugarcane is obtained.







# SUGARCANE PLANTER




**anon**

Wuhan Anon Tech-Trade Co., Ltd.  
www.anoncn.com

CE ISO



## SUGAR CANE PLANTER

**Khalsa**

50% Less Operational Cost

Educate use of Fertilizer and Seeds

Less Labour more Yield

25% more Germination

Required Seed Placement

Easy To Operate

9 Work Operation

1 Machine

Govt. of India

TOV 9001

An ISO 9001 : 2015 Certified Company





## YOUTUBE LINK



- <https://www.youtube.com/watch?v=xle2EjQ>  
[Nols](#)
- METHODS OF SOWING



## TEXT BOOKS

- |    |  |
|----|--|
| 1. | Michael, A.M. & Ojha, T.P. “Principles of Agricultural Engineering Vol. I & II”, Seventh Edition, Jain Brothers, New Delhi, 2011. (Unit I,II,III,IV,V) |
| 2. | Jagdishwar Sahay. “Elements of Agricultural Engineering”, Standard Publishers and Distributors, 2010. (Unit III,IV,V)                                  |
| 3. |  |
| 4. |  |



**THANK YOU**