



**ROHINI COLLEGE OF ENGINEERING AND TECHNOLOGY**  
**AUTONOMOUS INSTITUTION**

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**24AG201**

**CROP PRODUCTION**  
**TECHNOLOGY**

**UNIT 3**

**CROP**

**MANAGEMENT**

### 3.2.3.2. FERTIGATION SCHEDULES FOR SOME SAMPLE CROPS

#### 1. FERTILIZATION OF COTTON:

Plant population: 60,000-90,000 plants/ha.

Expected yield: 4.0 MT/ha of lint.

Recommended average rates of nutrients (Kg/Ha):

N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
200-235	80-110	200-250

#### Fertigation (to be applied during 90 irrigation days)

Growth stage	Nutrient demand -----kg/ha/day-----			Recommended fertilizers -----kg/ha/day-----		
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Multi-K	MAP	AN
Vegetative development	0.03-0.1	0.02-0.07	0.03-0.05	0.06-0.12	0.03-0.12	0.05-0.25
First flower upto two weeks after flowering	0.25-0.35	0.09-0.18	0.23-0.28	0.5-0.6	0.15-0.30	0.5-0.7
Boll development	0.6	0.18-0.09*	0.7-0.28*	1.5-0.6*	0.3-0.15*	1.2-1.4

#### 2. FERTILIZATION OF PAPAYA:

Cultivar: Solo.

Plant population: 1,800-2,000 plants/ha.

#### Recommended average rates of nutrients according to the plantation

Tree age	Nutrient requirement			Recommended fertilizer		
	Nutrients (Kg/Ha)			(Kg/Ha)		
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Multi-K	MAP	AN
2-6 months	10-20	35-45	10-20	22-43	60-75	0-15
6-12 months	40-60	90-115	25-50	55-110	150-190	45-65
1-2 years	60-80	125-150	90-120	195-260	205-250	30-50
Over 2 years	80-100	60-150	100-150	220-330	100-250	120-180

### 3. A COMPLETE FERTILIZATION PROGRAM FOR ONION

#### Fertigation

Weeks after transplanting	Nutrient requirements				Recommended fertilizers		
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Ca	Multi-K	AN	CN
	-----Kg/Ha-----				-----Kg/Ha-----		
2-6	14			0.9		40	4.5
8-12	6.5		23		50		

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**CROP PROTECTION INCLUDING MANAGEMENT OF WEEDS, PESTS AND**  
**PATHOGENS**  
**WEED and WEED MANAGEMENT**

**What is weed?**

Weed is a plant which is not wanted in a particular environment. It is otherwise called 'plant out of place'

- Example
  - If rice is cultivated any other crop is called weed

**General characters of weed**

- They are mostly grasses
- They have more adaptability than cultivated crops
- They compete with crops plants for resources
  - Water, nutrients, light and space

**Management of weeds may be classified into:**

1. Mechanical methods
2. Cultural methods
3. Chemical methods and
4. Biological methods

**Mechanical methods of weed control**

- It is by means of tools and implements
  - Ploughing
  - Hand hoeing and weeding
  - Digging and removing
  - Using sickles to cut
- **Merits**
  - Safe to environment
  - Does not involve any skill
- **Demerits of Mechanical Method**
  - Labour consuming
  - Possibility of damaging crop

**Cultural methods of weed control**

- It is by proper crop cropping systems and crop rotations
- Summer ploughing
- Mulching
- Blind tillage

**Chemical methods of weed control**

**Herbicide:** It is a chemical used to kill some targeted plants.

**METHODS OF APPLICATION**

- Spraying

- Broadcasting

### Biological methods of weed control

- Use of living organisms viz.,insects, disease organisms, herbivorous fish, snails or even competitive plants for the control of weeds is called biological control.
- In biological control method, it is not possible to eradicate weeds but weed population can be reduced.
- Examples of biological control
  - Water hyacinth is controlled by **Haycynth** moth
  - Opuntia is controlled by **scale insects**
  - Parthenium is by **Zygogramma beetle**

## PEST MANAGEMENT

### 1. CULTURAL METHODS

- Intercropping
- Planting dates and crop duration
- Planting density
- Water management
- Crop rotation

### 2. PHYSICAL METHODS

Modification of physical factors in the environment to minimize pest problems

- Sun drying
- Collection & Destruction

### 3. MECHANICAL METHODS

- Light trap



- Yellow sticky traps



**Biological Control**

- Any condition under which or practice where by activity of a pest/pathogen is reduced by any other living organism
  - Parasitoids–wasp
  - Predators–grass hopper

**DISEASE MANAGEMENT IN AGRICULTURE CULTURAL METHODS**

**1. Clean Seed**

**2. Field Sanitation**

- Removal of diseased plant debris, burning and keeping the field clean is the best known method for eradicating the source of inoculum.

**3. Selection of field**

- The sick soil in which the soil borne inoculums persists should not be selected for the ensuing cropping season.

**4. Plant spacing**

**5. Flooding**

**6. Deep ploughing**

**7. Fertilization**

**8. Rouging**

Rouging is removing suspected plant which has infection by visual identification.

**9. Amount of irrigation**

**PHYSICAL METHODS**

**1. Soil solarisation**

- Clear polyethylene placed over moist soil, during summer days raises the temperature at the top 5cm of soil to as high as 52<sup>0</sup>C. The increased soil temperature from solar heat, known as solarization inactivates many soil borne pathogens and reduces the inoculums and the potential for disease-examples





## 2. Burning trashes

- Burning of rice stubble's and straw effectively reduce stem rot.

## 3. Soil mulching and polyethylene traps

- Vertical, sticky, yellow polyethylene sheets erected along the edges of susceptible crops attract a considerable number of aphids which stick to the plastic, reducing the amount of virus inoculums reaching the crop.

## CHEMICAL METHOD

- A variety of chemicals are available that have been designed to control plant diseases by inhibiting the growth of or by killing the disease-causing pathogens. Chemicals used to control bacteria (bactericides), fungi (fungicides), and nematodes (nematicides) may be applied to seeds, foliage, flowers, fruit, or soil.

## INTEGRATED WATER, NUTRIENT, PEST MANAGEMENT

### INTEGRATED WATER MANAGEMENT(IWM)

Integration of all possible means by which the crop water requirement is fully satisfied with minimum loss to the natural water resources but highly efficient to attain the potential crop yield.

#### Importance of IWM

- Crop production purely depends upon water to meet the food demand of growing population
- Share of water to agriculture is shrinking owing to urbanization and industrialization
- Loss caused by excess or deficit irrigation is extreme
- Hence it is the responsibility of the present generation to use the water judiciously by producing crop per drop of water
- It is the ultimate aim to increase the WUE
- It is by:
- 

#### Strategies for IWM

- Surface
- Sub-surface
- Pressurized irrigation
  - Drip irrigation
  - Sprinkler irrigation

### 3.4.2.INTEGRATED NUTRITION MANAGEMENT(INM)

#### What is importance of going for INM?

Increasing the use of chemical fertilizers to increase food and fibre production is the concern since:

- Soils which receive plant nutrients only through chemical fertilizers have started

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declining in crop yield

- The decline in productivity can be attributed to the appearance of deficiency in secondary and micronutrients
- The physical condition of the soil is deteriorated due to long term use of chemical fertilizers, especially the nitrogenous fertilizers

### Strategies for INM

- Organic nutrients
- Inorganic nutrients

## INTEGRATED PEST MANAGEMENT

Integrated Pest Management (IPM) is an ecosystem approach to crop production and protection that combines different management strategies and practices to grow healthy crops and minimize the use of pesticides. **Integrated Pest Management (IPM)** means the careful consideration of all available pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations and keep pesticides and other interventions to levels that are economically justified and reduce or minimize risks to human health and the environment. IPM emphasizes the growth of a healthy crop with agro-ecosystems and encourages natural pest control mechanisms. As per FAO

### Goal of IPM:

- To control pests and not to eradicate entire population
- Treatments are **not** made according to a predetermined schedule
  - Based on results of monitoring
- Treatments are chosen & timed
  - Most effective & least disruptive to natural pest controls

### Strategies for IPM

- Physical and mechanical
- Cultural
- Biological
- Chemical

## TYPES AND METHODS OF HARVESTING

### Harvest

It is an operation done either by cutting, plucking, picking, digging or a combination of more than one of these methods, for removing the economic part from the matured plant.

Pulses, cotton – Picking  
Maize, Bhendi, vegetables – Plucking      Flower  
(all) – Plucking  
Tuber crops – Digging  
Sugarcane – Cutting

Harvesting can be done only after assessing maturity. In general maturity means there is no more addition of source of sink (economic portion).