

# UNIT I : Advance Crop Production

Chapter 1: Food Production Including  
Horticulture Crops & Its Importance in  
The Economy and Nutritional Security

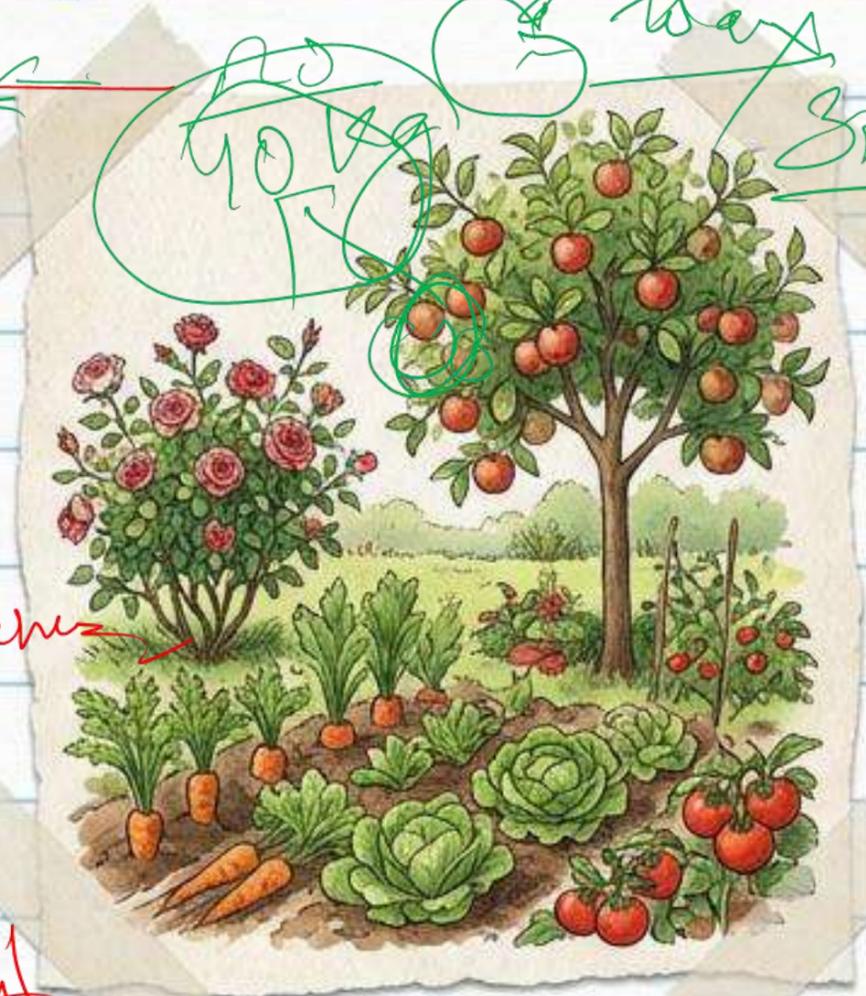
Study for  
Finals!

Class XII  
Agriculture Notes

# Definition & Scope

**Horticulture:** A branch of agriculture dealing with:

- Fruit crops
- Vegetable crops
- Ornamental plants & Commercial flowers
- Medicinal & Aromatic crops
- Spices & Plantation crops
- Individual trees, shrubs, climbers
- Post-harvest management and processing.



Handwritten note: *helps*

Handwritten note: *Carrot*

Handwritten note: *Tomato*

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Horticulture → 2 word

Hortus = Garden  
Cultura = Cultivation

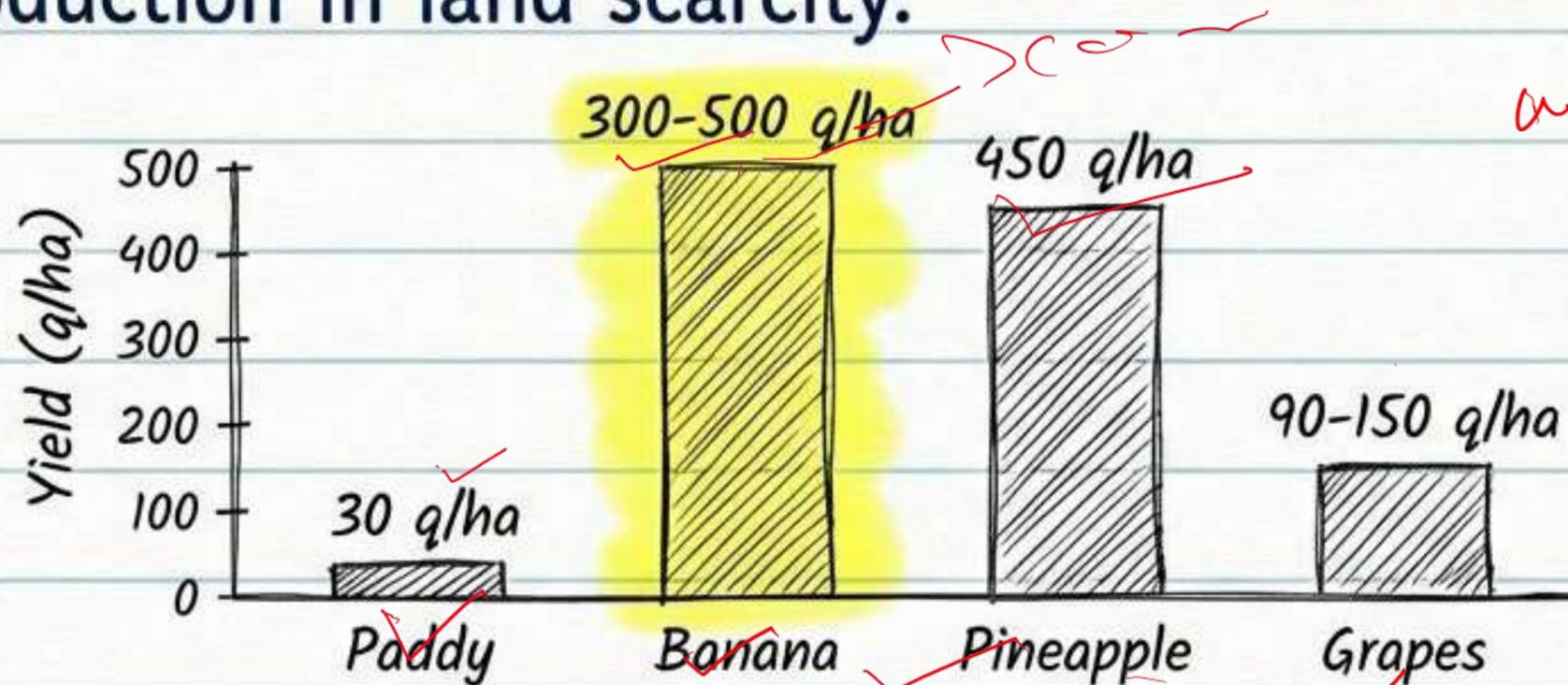
→ Hort

Latin →

# Importance of Horticulture Crops

## 1. Per Unit Area Yield is High

Horticulture crops yield much higher than field crops. Crucial for food production in land scarcity.



## 2. High Returns per Unit Area

More income from one unit of land.

Example: Well kept orchard (Apple, Grapes, Sweet Orange) =

Rs. 25,000 per ha net income.

### 3. High Employment Generation

Agriculture crops: 143 employment days/year  
Horticulture crops: 870 employment days/year

Some crops offer outstanding figures of 2000 employment days/year!

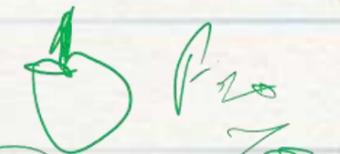
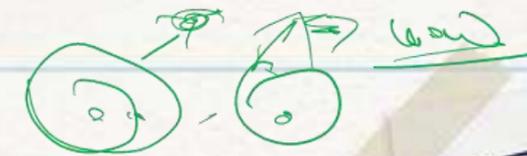
### 4. Best Utilization of Waste Land <sup>Land crop</sup>

Crops suitable for waste land areas: Wood apple, Custard apple, Karonda, Litchi, Cashew nut, Coconut.

### 5. Raw Material for Industries

Industries dependent on fruit/veg/flowers:

- Canning, Wine processing, Jam, Jelly, Preserve, Candy, Fruit beverage, Pickle, Drying & Dehydration.



## 6. Use of Undulating Lands

For uneven gradients where agronomy fails. Example: Konkan region - Mango & Cashew cultivated on large scales on hilly/hill back areas.

## 7. Religious Importance / Aesthetic Value

- Coconut → Kalpavriksha
- Banana → Apple of Paradise / Kalpatharu / Tree of Paradise / Adam's Fig
- Pipal (*Ficus religiosa*) → Religious tree of India / God Buddha
- Beal → God Shiva
- Sita Ashok (*Saraca indica*) → Goddess Sita / God Buddha
- Lotus (*Nelumbo nucifera*) → God Vishnu, Brahma, Goddess Saraswati, Laxmi
- Banyan (*Ficus benghalensis*) → God Buddha



## 8. Medicinal Importance

Parts used: Stem, leaf, flowers, roots, fruits.

- Rose water → Cure eye ailments
- Saffron → Ingredient in medicines
- Papain → Digestive enzyme
- Sweet lime → Liver ailment
- Pomegranate rind & Guava pectin → Stomach upset
- Arjun bark → Heart troubles
- Neem water → Skin irritation & allergies

**Triphala:** Made from Aonla, baheda, and harad.

## 9. Reputation Generation

High return value & knowledge = Farmer Reputation.

## 10. Nutritive Value

Macronutrients (Energy sources): Carbohydrates, Protein, Fat.

Micronutrients (Body building): Vitamins, Minerals.

### ICMR, New Delhi Recommendations (Per Capita/Day)

- Leafy Vegetables: 125g
- Root/Tuber Vegetables: 100g
- Other Vegetables: 75g

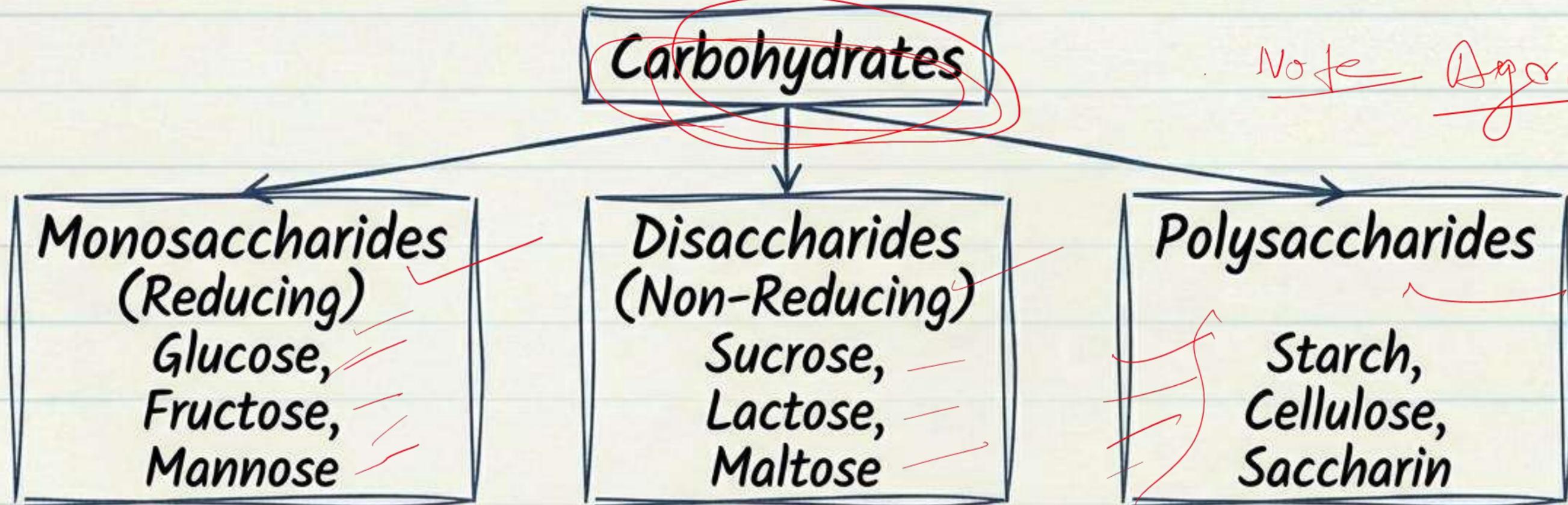
TOTAL VEG: 300g/day

FRUITS: 120g/day

# 1. Carbohydrates (Chief source of energy)

1g glucose = 4.0 calories. Daily Requirement = 400-500g.

Note Agrifair



Fruit Sources	Vegetable Sources
Raisins (77.3%), Apricot dry (72.8%), Date (67.37%), Karonda dry (67.1%), Banana (36.4%), Bael (30.6%)	Cassava (38.1%), Sweet Potato (28.2%), Potato (22.6%)

## 2. Proteins ✓

Complex nitrogen compounds.

Body building.

20 amino acids (10 essential).

1g protein = 4.0 calories.

Daily Req = 60-70g.

Egg

Cashew nut: 21.20%

Almond: 20.88%

Walnut: 15.60%

Lima Bean: 7.9 g/100g

Pea: 7.2 g/100g

Cow Pea: 4.3 g/100g

## 3. Fat ✓

Stored energy.

1g fat = 9.0 calories.

Pecan nut: 70.0%

Walnut: 64.5%

Almond: 58.9%

Cashew nut: 46.9%

Avocado: 22.8%



## 4. Vitamins ✓✓

1. Water Soluble: Vitamin B complex, Vitamin C.
2. Fat Soluble: Vitamin A, D, E, K.

### Vitamin-A (Retinol, Carotene) ✓

Requirement: 1.2 mg/day. Precursor: Carotenoids.

Deficiency Symptoms: Night blindness, Xerophthalmia (children), Keratinization of eye epithelial cells.

Vegetables are richer in Vit-A than fruits.

Fruit Sources	Vegetable Sources
Mango (4800 IU), ✓	Bathua leaves (113000 IU), ✓
Papaya (2020 IU), ✓	Colocasia leaves (10278 IU), ✓
Persimmon (1710 IU), ✓	Turnip green (15000 IU), ✓
Date palm (600 IU). ✓	Beet leaves (9770 IU).

## Vitamin-B1 (Thiamine)

Req: 1.2 mg/day.

Deficiency: Beriberi, Muscular weakness, Weight loss, Neuritis, Loss of appetite, Heart dilation.

Cashew nut (630 mg/100g), Walnut (450 mg), Almond (240 mg).

Chilli (0.55 mg), Pea (0.25 mg).

## Vitamin-B2 (Riboflavin)

Req: 1.7 mg/day.

Deficiency: Dry scaly skin, cracks in corners of mouth, cracking lips.

Bael (1191 mg/100g), Papaya (250 mg), Cashew nut (190 mg), Pineapple (120 mg).

Palak (0.56 mg), Chillies (0.39 mg), Fenugreek leaves (0.31 mg).

## Vitamin-C (Ascorbic Acid)

Req: 70 mg/day. Deficiency: Scurvy. 90% of Vit-C obtained from fruit/veg.

Fruit Sources	Vegetable Sources
Barbados Cherry (1400 mg/100g)	Drumstick leaves (250 mg)
Aonla (600 mg)	Coriander leaves (135 mg)
Guava (299 mg)	Chillies (111 mg), Broccoli (109 mg)

## Other B Vitamins

**Vitamin-B3** (Nicotinic Acid): Req 19 mg/day. Def: Pellagra, nervous breakdown.

**Vitamin-B6** (Pyridoxine): Req 1.3 mg/day. Def: Lack of energy, high Homocysteine. Sources: Summer squash, bell peppers, spinach.

**Vitamin-B12** (Cyanocobalamin): Req 2.4 µg/day. Def: Pernicious anemia.

**Note:** Vit-B12 is NOT found in veg/fruits (only animal food).

# Fat Soluble Vitamins (continued)

## Vitamin-D (Cholecalciferol)



Sun

Deficiency: Rickets, Pigeon chest (children), Osteomalacia (adults).

Source: Synthesized by body through sunlight.

Vit-D

## Vitamin-E (Tocopherol)

Req: 5.0 mg/day.

Function: Anti-sterility vitamin.

Deficiency: Kidney degeneration, Liver necrosis.

Source: Sweet corn is rich source.

## Vitamin-K (Phylloquinone)

Function: Anti-hemorrhagic vitamin.

Req: 0.015 mg/day.

Deficiency: Delayed/faulty blood coagulation.

## 5. Minerals

- **Calcium:** Litchi (122.5 mg/100g), Palak (3.3 mg), Amaranths leaves (1.0 mg).
- **Iodine:** Req 500-600 mg/day. Deficiency: Goiter. Sources: Onion, garlic, beet, agathi leaves.
- **Iron:** Req 20 mg/day. **Phosphorus:** Req 20 mg/day.
- **Potassium:** Spinach (605 mg/100g), Amaranths leaves (230 mg).
- **Sodium:** Req 4000-6000 mg/day. Sources: Celery, green onion, Chinese cabbage.
- **Folic Acid:** Req 0.1mg/day. Def: Anemia. Important for women. Source: Green leafy veg.

## 6. Fibers

Component of plant materials. Digestion promotion.

Max fiber fruit: Fig (7g/100g) > Guava (6.9%).

Max fiber veg: Potato (2.2g/100g).

# Chapter Practice

## Questions:

1. Define Horticulture?
2. Write down per capita ICMR recommendation for fruit & Veg. Per Capita  
100g 300g  
↑
3. Deficiency symptoms of Ca, Vitamin-C, and Vitamin-A. →
4. Role of fiber in diet. → Blood Sugar
5. Importance of horticulture. ✓ Rickets value ↑

**Fill in the Blanks:** 1. Rickets disease is due to.... Vit D

2. Beriberi disease is due to.... Vit B1

3. Per Capita per day Carbohydrate requirement.... 225g to 326g

4. 1 g fat liberates .... calories of energy.

5. Iron content in Karonda fruit is.... 30 gm per 100g

**Objective Questions:** 85g, b. 125g, c. 100g, d. 300g

2. Rich source of fat: (a. Walnut, b. Pecan nut, c. Avocado, d. Cashew)

3. Rich source of Fe: (a. Karonda, b. Litchi, c. Mango, d. Date palm)

4. Veg is poor source of: (a. Vit, b. Carb, c. Fat, d. Protein)

5. Vit-C in Barbados Cherry: (a. 600mg, b. 1400-1600mg, c. 299mg, d. 15)