



INTRODUCTION TO HORTICULTURE



Divisions

- Scientific
 - Plants and Animals
- Islamic
 - Plants, Animals and Ashraf-ul-Makhluqat (Humans)
- Raising of crops and rearing of animals is termed as agriculture
- Agriculture includes 3 major disciplines
 - Agronomy: field crops
 - Forestry: forest crops
 - Horticulture: fruits, vegetables and ornamental crops



HORTICULTURE

- ❖ Horticulture is derived from two Latin words
 - ❖ *hortus* means garden &
 - ❖ *colere* means to cultivate
- ❖ Term horticulture was used for the first time in 1631
(Halfacre and Barden, 1979)
- ❖ Horticulture: production within an enclosure
(Bailey, 1993).
- ❖ Branch of agriculture deals with intensive cultivation of plants used for
 - ❖ food
 - ❖ medicinal purposes or
 - ❖ aesthetic gratification
(Janick, 1986)
- ❖ Therefore hort. is concerned with garden crops and is parallel discipline to agronomy and forestry



Hort. vs Agro & Forestry

- ❖ Garden means an enclosed place of intensively cultivated land

- ❖ **Differences**

- ❖ Use
- ❖ Custom/tradition
- ❖ Intensity of cultivation (Extensive and Intensive)

- ❖ **Use**

Hort. crops

- ❖ more water
- ❖ Highly perishable
- ❖ Utilized fresh
- ❖ High cash value
- ❖ Intensively cultivate

Agro. & Forest crops

More in dry matter
less perishable
Used in non-living state
less cash value
extensive cultivation



Hort. vs Agro & Forestry

❖ Uses

Potato & Sweet potato

- ❖ are agronomic crops when used as staple food
- ❖ Dealt as vegetables due to intensive mode of cultivation in Pak.

Walnut, mango and pine

- ❖ forest crops when planted for wood and
- ❖ horticultural crops when used as fruit and ornamental trees.

❖ Cultivation

Melons

- ❖ agronomic when cultivated extensively
- ❖ horticultural crop when cultivated intensively

- ❖ High cash value of horticultural crops justifies large input of capital, labour and technology per unit area of land.



Hort. vs Agro & Forestry

- ❖ Horticultural products are sources of
 - ❖ aesthetic pleasure i.e., beauty and pleasant flavor.
 - ❖ fruits and vegetables like cashews and garlic are highly nutritious but eaten as source of flavor and pleasure.
- ❖ Horticultural foods may be distinguished from agronomic food products by
 - ❖ aesthetic
 - ❖ food



Horticulture: Defn.

- ❖ deals with a large no of plant species including
 - ❖ fruits
 - ❖ vegetables and
 - ❖ ornamental plants
 - ❖ medicinal plants
 - ❖ beverage plants (tea, coffee) and
 - ❖ spices
- ❖ an art as well as a science
- ❖ culture and biology of garden crops including
 - ❖ aesthetic and
 - ❖ scientific dimensions
- ❖ Physics, chemistry and biology are used by the horticulturist to understand and manipulate plant life
- ❖ Biotechnology has direct applications in horticulture



DIVISIONS OF HORTICULTURE

- ❖ 3 basic divisions

- ❖ Pomology or fruit production.
- ❖ Olericulture or vegetable production.
- ❖ Floriculture or flower production.
- ❖ Others
 - ❖ Landscape horticulture
 - ❖ Plant propagation and nursery management
 - ❖ Seed production and marketing
 - ❖ Greenhouse crops
 - ❖ Medicinal, pharmaceutical and aromatic crops
 - ❖ Post-harvest technology
 - ❖ Breeding and biotechnology
 - ❖ Mushroom production



1. Pomology

- Pome fruit
- Logos to study
- ❖ study of fruits

- ❖ fruit is a ripened ovary (botanically)
- ❖ Involves other floral parts as well (Hort.)
 - ❖ fruit is edible fleshy or dry portion of a plant whose development is closely associated with flower.

- commercial production of fruits is known as orcharding (perennials)
 - Vineyards and viticulture
 - Citrus groves and citriculture



Pomology Contd.

- ❖ Long term high capital investment without immediate returns.
- ❖ Careful
 - ❖ Site selection, Species, Cvs.
- ❖ All major fruit crops are clonally propagated
- ❖ Parts of a fruit plant
 - ❖ Rootstock: part on which scion is budded/grafted
 - ❖ Scion: bud/piece of twig budded/grafted on to a rootstock
 - ❖ Provides canopy and fruit bearing surface
 - ❖ Used for food synthesise
- ❖ Commercial cvs. are used as scion while r/s belong to different sp.
- ❖ Farm operations include:
 - ❖ Pruning
 - ❖ Training
 - ❖ Thinning of fruits
- ❖ Except few nut crops, all fruit crops are highly perishable.
- ❖ Post-harvest handling involves
 - ❖ Grading, packing, storing, processing, shipping and marketing



Status of pomology in Pak.

- World grapes > Citrus > banana
- Pak. Is lucky to have
 - all the four seasons
 - Temperate, tropical and sub-tropical zones
 - soil diversity
 - 30 different fruit crops are being successfully cultivated in this small country
- In Pak. Fruit ranking is as follows
 - Citrus > mango > date > guava > banana
- Citrus: 95% in punjab
- Mango: mostly grown in Southern distt. Of Punjab & Sindh



Sub-divisions of pomology

- Practical pomology
 - Practice of growing fruit plants

- Commercial pomology
 - Commercial production
 - Production, grading, washing, packing, storage and marketing

- Systematic pomology
 - Tech. aspects of fruits
 - Nomenclature
 - Dist. In world
 - Habitat
 - classification



2. Olericulture

- Oleris herb
- Culture to cultivate
- Edible portion of a herbaceous plant used fresh or processed. E.g.
- Fruit tomato
- Foliage lettuce, spinach and cabbage
- Tuberpotato (stem)
- Root sweet potato, radish and carrot
- Seeds peas
- Potatoes and other veg. together produce more food (by wt.) than any other food crop in the world.

- In Pak. 50 different veg. are grown in 2 growing seasons

- Compared to orcharding, vegetable industry is more flexible b/c most veg. are grown
 - as annuals
 - Shifts in cultivars
 - Crops can be readily made



Sub-divisions of olericulture

- a. Home gardening
- b. Market gardening
- c. Truck gardening

- Others
 - Vegetable forcing
 - Production for processing
 - Seed production
 - Mushroom culture



a. Home/Kitchen gardening

- Growing for home consumption
- Important in rural households
- Oldest form of veg. production
- Most economical source of fresh veg.
- Good source of income
- 10-20 marlas are good enough for growing veg. & some fruits for an average family
- Vanishing in rural areas due to commercialization
- People need to be educated and supplied seeds and other inputs & encouraged for kitchen gardening
- It is source of organic food which is fetching even higher prices in western world compared to GMOs



b. Market gardening

- Near big cities veg. are produced for sale in the local market.
- Fulfills need of people without land, time and interest to grow their own veg.
- improved means of transportation helps to transport to distant markets as well.
- Sewage water is used as fertilizer & irrigation.
- The prod. Have more chemicals, heavy metals (in industrial areas like Fsd.) and amebic organisms w/c are hazard to human health
- Glut formation is often faced by the growers due more supply of veg. in the market and low returns
- Solution
 - Careful sowing
 - Selection of right kind of veg.



c. Truck gardening

- Production in large quantities for distant markets
- Special crops are selected (usually less perishable)
- Grown in different agro-ecological regions
 - Potatos in okara distt.
 - Melons and peas in gujranwala
 - Cabbage and cauliflower in khushab
 - Winter muskmelons in lower sindh
 - Late summer crop of onion in Balochistan and Swat
- Less intensive than market gardening
- Marketed in whole sale markets

- Due to improvement in transportation facilities, roads, refrigerated cabins, improved communication, perishable crops of the market gardening can also be cultivated in truck gardening
- Eg. Tomatoes (highly perishable), cultivated in frost free areas during winter and shipped to distant markets.



Specialized production tech.

- 1. Vegetable forcing
 - Off season prod. of veg.
 - Costly but consumer is ready to pay more
 - Eg. Early and late prod. Of summer veg.
 - Usual limitation in summer veg. like tomatoes, cucumber, eggplant, bell peppers, melons, gourds is frost
- Produced in GH in developed countries making more intensive cultivation
 - Commercial prod. Of GH crops is not feasible here
- We have large no. of
 - agro-ecological climates
 - Several frost free pockets in Punjab and NWFP
 - Summer veg. can be grown in entire lower sindh
 - Parts of malakand and kattha area of khushab are large producers of tomato



1. Vegetable forcing

- Traditionally market gardeners produce veg. on small scale protected with Sarkanda or branches of trees
- Now use of plastic tunnels erected on field beds like veg. marrow
 - High tunnels for cucumber, tomatoes, bottle gourds, peppers and egg plant
- Plastic tunnels: low cost alternative to green house



2. Veg. prod. for processing

- Processing preserves veg. for future use
 - Developing in our country yet
 - Western world veg. are specially produced for processing
- Veg. can be used in
 - Glut season
 - Helps in price stabilization
 - Prolonged availability of veg.
 - Emergency needs
- Imp. Types of veg. processing
 - Canning (peas, beans, mushrooms)
 - Freezing (spinach, okra, peas, sweet corn)
 - Dehydration (onion, garlic and root veg.)
 - Making industrial prod. Like ketchup, potato chips etc.



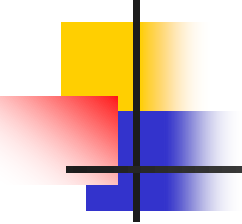
3. Vegetable Seed Prod.

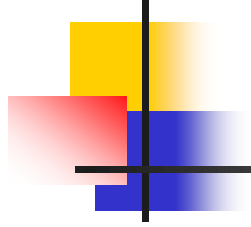
- Small component
 - Very important and Specialized
 - Needs breeders and pure lines and CMS lines for hybridization programs on mass scale
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- **4. Mushroom culture**
 - Needs to be established here yet
 - Has great potential

3. Floriculture and Ornamental Hort.



- Deals with plants and their layout for beautification of the env.
- More no. of ornamental plants
 - Flowering plants
 - Foliage plants
 - Lawn grasses
 - Evergreen and deciduous shrubs and trees
 - Fruit trees grown in home
- Sel. Of plants are acc. To
 - Situation of home, public/private building
 - Road
 - Public facility (airport)
 - Recreational places (parks) is landscape designing.

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- Orn. Hort. Plays imp. Role in modification of domestic and urban environments and pollution control
 - Importance increasing with awareness
 - Producers & whole salers in large cities and remote areas eg. Pattoki major center of nursery business
 - Orn. Hort. Used for
 - Essential oil and aromatic compounds (jasmine and rose)
 - For sale as cut flowers (rose, tube rose and glad.)
 - For medicinal purposes (menthol, amaltas)
 - More scope of export of cut flowers and foliage
 - Eg. Holland >95% of foreign exchange is from floriculture



THANKS
ANY QUESTIONS



Next lecture

- Significance of Hort.