CHAPTER - VI

MAJOR PROBLEMS IN HORTICULTURE

INTRODUCTION

Horticulture, the most fascinating avocations of farming profession is highly sensitive to the climatic conditions. All fruits, flowers and vegetables cannot grow successfully in all types of climate and soil. Different varieties show differences in their tolerence of adaptability. The poor cropping in the orchard, which horticulturists face very often are associated with various factors both external and internal. Among the external factor's environment, insects, pests and diseases as well as nutrition are very improtant. The chief internal factors which influences in the fruitlessness or poor quality of flowering are sex distribution, heterostyle, dichogamy, aborted organs, non viable pollen, genetic incompatibility and nutritive conditions (Singh, et. al.,1964).

6.1. ENVIRONMENTAL PROBLEMS :

6.1.1. Light

Light intensity influence plant growth and development. Relative length of light and dark periods influences photosynthesis and respiration, formation of carbohydrates in fruit crops, formation of flower buds and in the development of storage organs. In general, within any given 24 hour period, most of the long day - short night plants require 8 to 10 hours of continuous dark and most of the short day - long night plants require 10-14 hours of

continuous dark for the formation of their flower buds. (Edmong et.al, 1979). Horticulturists have to select varieties which are adapted to the relative length of light and dark periods in a given location.

6.1.2. Heat and Temperature

Each crop need a certain range of temperature. If they are grown below or above the range of optimum temperature, the production is bound to suffer. Unreasonably high temperatures during late winter and early spring are frequently injurious to many fruits and flowers as the buds lose their hardiness, or resistance to low temperatures. Harmful effects of winter temperatures are classified as follows: (1) injuries due to immaturity of the tissues, (2) injuries due to unreasonably high temperatures followed by low temperatures, (3) injuries associated with winter drought and (4) injuries due to insufficient cold. High temperatures may promote sugar content but low temperatures can cause late blossoming and also inhibit insect activity.

6.1.3. Rainfall

Excessive and deficient in rainfall are vital problems to horticulture. Heavy rainfall leads to water logging conditions resulting poor blossoms and fruiting. On the contrary, low rainfall needs irrigation which means a rise in cost of production but losses due to pests and diseases are minimised. West Bengal, being blessed with almost all types of major Agro-climatic zones of India faces related troubles also. Natural calamities , either in the form of flood or drought simultaneously or sometimes together in the State threatens Horticulturists. Of all the climatic parameters, rainfall appears to be single dominent variable that has

prevented sustained agricultural production. West Bengal receives an average rainfall of 200 cm per year, 80 p.c. of which is concentrated during June to October. When there is an excessive and continuous rainfall occur, river beds are silted to carry the excess volume of water, cover flooding the banks and causing flood. On the contrary, excess of evaporation over precipitation with hot spells, scanty vegetation due to poor and unproductive soil, results drought. According to Indian Meteorological Department, the area is declared "Drought Prone" where rainfall is less than 75% of the normal fall excluding the areas having 30% of their land under irrigated scheme.

"Flood Prone" districts of West Bengal are the districts of North Bengal, (specially, Jalpaiguri, Malda, Murshidabad) Nadia, Medinipur, southern part of 24 Parganas along with Calcutta, Hugli, Haora and Barddhaman. Almost every year some of them have to face grave situations due to sudden low pressure and continuous rain or chocked drainage systems.

6.1.4. Humidity :

Atmospheric humidity is very much important to concern. Its effect on plant growth and development may be ; (1) favourable, (2) deficit and (3) excess. Both the deficit and excess conditions are taken to be care of. The immediate effect of deficit of humidity is reduction in the size of the cells in the region. Mild deficiencies produce stems with shsort internodes and leakes. Flowers and fruits are also small with dull finish. The effect of deficit explains why marketable yields are low after a dry spell and the plants become succeptible to winter injury. Water deficit during summer produce crops of poorly filled nuts. The extreme effect is witting. With continued witting, plants continue to starve and finally die. Excess condition produces leggy seedlings and the growth cracks. Some tropical fruits, like jackfruit, banana requires high humidity but in other fruits high atmospheric humidity effects adversely in colour and

keeping quality. Humid conditions also promote bacterial growth and fungus.

6.1.5 . Wind

High and hot winds and cyclones cause severe damage to these highly sensitive products. Strong dust storms restricts the growth of fruits, cause breakage of the branches of fruit trees and shedding of flowers, vegetables and fruits. Only the area where hailstorm do not occur is suitable for horticulture. In such areas, raising of dense windbreak belts and selection of protected sites are necessary for successfull crop production.

6.1.6. Altitude and Slope :

The elevation of the land, meant for orchard, refer to the altitude of the surface of the land above or below sea level (with an elevation of 1,220 meters a decrease of about 7.8°C is obtained). These differences in elevation, within any particular region, are chiefly responsible for differences in the length of the frost free growing period and the maximum temperatures that occur. Mountain slopes, facing the direction of the prevailing wind or widward slopes have more rain and lesser amount of sunshine and unless the soils are well-drived, excess of water become a serious problem. Similarly, leeward slope (the opposite one) have relatively dry air and greater amount of sunshine, need irrigation during the period of water deficit. Horticu ltural crops are grown on level and slightly sloped sites. Most flowers and vegetables require cultivation and pest control and harvesting operations can be performed more efficiently on such lands.

6.1.7. Soils

The soil fitness for horticultural crops cannot be judged by that of cereal crops. The physical and chemical composition of the soil play very important role for the success of orchard. Ideal soil should be porous, aerated, at least 2 m deep, having uniform texture upto the depth, possessing perfect drainage and water table about 3m. Fluctuating water table damages the root zone and struggles for moisture and nutrients. Low water table zone reduces the vigour and longivity of the trees. Soil improving crops reduce erosion, checks the flow of water, spread and filter it from its load of silt, increasing the fertility of soil. The selection of a soil improving crop depends on many factors like - (i) kind of crop (legume or non legume); (2) adaptation to soil and climate; and (3) types of horticultural enterprise.

6.1.8. Insect, Pests and diseases

Insect pests and diseases are also serious problems in horticusltural crops. The common diseases which affect harbaccous, annuals, biennels and other ornamental plants are : (a) "Damping off", due to over watering (b) stem rot (found in Dahlia, Pansy, Carnation et.) ; (c) leafspot and blight (chrysenthemum and Jasmine); (d) foot rot (aster and other annuals); (e) powdery mildew (roses, zinnia, floxes, sweet peas etc.) which produce white powdery coating on the foliage, are all due to various types of fungi. Various diseases are also found in annuals like marigold, hollihock etc. Apart from fungi, insect pests like 'Aphids', 'Bealtes', 'thaips', 'cut-worms', 'caterpillars', and 'scale insects' are also headache of the Agriculturists. Mango hoppers; if

infest mango blossoms may blast all the flowers on a tree or even in the whole orchard. The cosntrol of such pests and diseases and suitable preventive measures are very much important (Roy Chowdhury, S.P., et.el., 1968, 1970).

6.2. PRACTICE TO INDUCE FRUITING

To induce proper fruiting and flowering, certain treatments like (a) cultivation, spraying, pruning of the leafy growth are exercised on limited scale and (b) root exposure, bounding, ringing, notching, smudging are practiced on desired portions of the trees.

6.2.1. Pollination Problem

Pollination problem occurs in diocious trees like Papaya. To ensure good setting of fruits, one male tree for every ten female trees should be planted. Thinning of blossoms is practised when the tree have tendency to bear too many flower buds, flowers and fruits in the 'on' year. 'Blossom thinning' is done in deciduous fruit trees. A few young fruits from heavily bearing clusters provide greater advantage of space, light, water, good to others so that they can be expected to be larger in size, better in quality and brighter in colour.

6.2.2. Mulching of soil

From an orchard maximum production is possible only when the soil is managed carefully and the nature is devoid of calamities. 'Mulching' of soil (covering the inter spaces with hay, straw, cut grasses etc.) Conserve moisture and also facilitate hibernation of rodents. Growing of permanent cover

crops on undulating or sloping land is needed to prevent soil erosion. In the cases of intensively cultivated fruits like citrus, irrigation channels are kept clear so that inter crops thrive well. Raising of vegetables, pulses and short duration fruit crops in the orchards of parmanent fruit crops can relieve the farmer economically till the net return comes from the orchard. Short duration fruit crops like papaya, Banana and Pineapples are very commonly used as fillers. The choice of inter crops depend on the fruit trees grown, location of the orchards, nature of the soil and the amount of rainfall received by the area. Orchards, near by towns and cities, profitable grow vegetables like cauliflower, cabbages, carrots, beets, raddish, lettuce, spinach, tomato, okra etc. whereas far away orchards can benefit from crops like onion, potato, garlic, chilli, pulses and gram.

6.2.3. Manuring and Fertilization

Adequate fertilizer is necessary to feed them all. Decomposition of cover crops, leaf litters, twigs etc. form excellent green manure by the help of soil micro-organisms. Other organic manures are farmyard manures, oil-cakes etc. "Farmyard Manure" is prepared by adding 1.5 per cent nitrogen, 0.5 per cent phosphoric acid and 1.3 per cent of Potash. Among the concentrated fertilizers Nitrates of Ammonia, Sodium and Potassium, Phosphates of Calcium, Sodium and Potassium fertilizers are used to enrich the orchard soil.

6.2.4. Root Pruning

To force flowering in fruit trees like mosambi, mandarin orange, which flowers three times in a year, results in erratic setting and maturing in small, inferior quality crops at different times of the year. About two months before

the blooming period, soil around the trees is removed and the main roots are exposed to the Sun and the tertiary roots are removed. During this period 'root exposure' the tree is forced to take rest. The method is most suitable in retentive soils (remain moist for long time). 'Root Pruning' is practised for the culture of dwarf fruit trees. Every year, a trench is dug a few cm further away from previous year's trench and the roots are pruned to within 3-5cms of the stumps of the former year. After pruning the trench is filled with manures liberally (Singh, Krishnamurthy et.al., 1983).

6.2.5. Bending System

Bending of branches is widely practised for increasing fruit production in guava, specially in the erect growing varieties. Large branches are bent and tied in arch fashion with other similar branches increasing fruiting area. "Ringing" or girdling is made on small branch just below a flower or flower cluster. Due to downward movement of carbohydrates collected above the ring develope the fruits into bigger size. Ringing is practised on trees which are vigorous in vegetative growth. "Notching" is partial ringing in which strip of bark, just above or close to the dorment bud is removed to encourage more seasonal growth. Sometimes "Smudging" or smoking of the trees is done to direct the smoke to all parts of the trees which ensures swelling of terminal buds. This practice is usually done on mango trees.

6.3. LOCATIONAL PROBLEMS :

6.3.1. Northern Hilly Region

Northern Hilly Region, comprising three sub-divisions of Sadar, Kalimpong and Kurseong of Darjiling district, faces

different problems in horticulture. Temperatures below freezing point is experienced almost every year. Frosts are common. Due to snowfall in the high mountains cultivation on the slopes and terraces is always facing problems' of soil erosion and leaching. Crop production varies with altitudes.

6.3.2. Terai Region

Hilly region slopes down and merges into Terai Region covering the areas of Siliguri sub-division of Darjiling, Jalpaiguri and Kochbihar districts. High temperature, rainfall and humidity is always taken to be care of for the orchards in this zone. The area is dissected by Himalayan rivers and their rivulates and hence becomes a victim of catastrophic floods for a number of times. During heavy monsoonal rain, these rivers carry large volume of water loaded with pebbles, gravels, sand, silt etc. Due to sudden decrease of slopes they are deposited in the lower courses of the alluvial region of "Barind" tracts. Soil conservation is a burning problem here. Construction and maintenance of dams and dykes or embankments needed constant attention for the cultivation pactices here.

6.3.3. The Alluvial Zone of Central and South Bengal

The most enriched zone of horticulture in West Bengal covers the areas of the districts of West Dinajpur, Malda, Murshidabad, Nadia, Uttar 24-Parganas, Hugli and Barddhaman. The chief natural calamities to which the area is exposed are floods, droughts and hailstorms. The "Barind" tract of Malda district is the high land of red-clay soil of old alluvium. Water scarcity in the summer make the region arid. The "Diara" land consists of a strip of 11 km. in width along the western and southern sides of the district. It's

formation is the result of centuries of fluvial action by the Ganges. This is the principal crop zone and most of the mango orchards of West Bengal are located here. The "Tal" is low-lying areas and subject to inundation and hence are not suitable for horticultural although some low-lying areas near 'Bills' and valleys, soils are very fertile and encourage to grow vegetables amply there.

6.3.3(a) Problems in the Mango Orchard

Mango, the most precious horticultural crop of the alluvial zone of central and South Bengal is a very chance crop. Trees do not yield fruits every year on same scale. A good crop usually comes in every fourth year which is followed by bad years. Mango growers have to incurr losses due to persistant of non-bearing of fruits in bad years. Most orchards are very old. Average age is being 30 to 100 years and replacement is the prime necessary today. Trees of the old orchards are easily attacked by pests. The greatest enemy is "Mango Hopper" which attacks the flower cluster and suck the sap powdering mildew. The growers of landholders have to bear the cost of insecticides and sprayings twice or thrice in a year. hailstorms and rain during the flowering season in February March, Nor'wasters in May and Pest attacks are the factors responsible for crop failure. Inspite of ancestral dignity, favourable climatic and edaphic factors, production is not always satisfactory for one or other reasons. More than 90 per cent of the gardens are not sprayed with insecticides nor weeded or manured properly for the peculliar system of organisation of mango production under which a garden changes hands at least thrice during the flowering, blossoming and maturing stages. Owners are not interested in taking care of the orchards as they know it will change hands.

6.4. POST HARVEST PROBLEMS

Harvesting of horticultural crops, which is fragile and highly perishable product and are very profitable only when they are handled with care. There remains a risk of tearing of flesh or rind of fruits white packing. Although ladder is used for plucking from high trees by hand is always the best. Stages of picking depends on the distance of market. Some fruits tend to deteriorate when allowed to ripen on the tree and hence should be plucked in a little immature stage. Picking under heavy dew or wet weather can bruise the fruit surface causing spots and hence fetch low price. Summerizing, loss in horticulture have been found mainly due to

a) injuries due to unscientific plucking.
b) conventional garding at the assembling centre
c) highly unsuitable and damaging system of transportation in moving the fruits and
d) the stage of maturity of the fruits plucked for export.

6.5. PROBLEMS IN MARKETING

The main problems in marketing of flowers and vegetables are :

a) Seasonal demands, like Durga Puja or other social functions, marriage season etc. which are very much restricted in some especial months of the year.

b) The products are highly perishable and delicate as to handle them for plucking to marketing.

c) Cold storage for keeping potato is not convenient in case of temperature and humidity requirements. Asdbout 96 p.c. of the total capacity of cold storage in the State are used for the preservation of potato and only 4 p.c. capacity is used for other items like fish, egg and horticusltural products. Agains, it appears that 80 p.c. of the unit space is reserved for farmers of which 50 p.c. is for small, marginal and share croppers whose sharing capacity is not more than 10 quintols per farmer. The balance of 50 p.c. of the 80 p.c. is reserved for farmers having capacity to store more than 10 quintols. The remaining 20 p.c. is offered for other hirers, that is for fruits, vegetables and flower growers.

d) Market price is reduced if the flowers are not sent to the market just after plucking even in the high season as they loose their quality. so, any problem with transport facility can damage heavily the flower trade.

Alhtough flower supply is high in the rainy season and winter (when varieties of season flowers grow) but demands are higher in Autumn (August to October) due to "Puja" (Festival of Durga Puja, Lakshmi Puja and Kali Puja) festivals and in winter due to marriage seasons. Price rises high even there is sufficient supply in the market. Summer months also fetch good sprice again due to marriage season. On the contrary, as there is no such big festival nor any marriage season in the months of November and December, prices goes down when the supply remains sufficient. Growers did not get price accordingly.

CONCLUSION :

From the discussion of various problems related to the horticulture, which is the most fascinating avocations of farming practices as it is highly sensitive to the environmental conditions. It is revealed that the problems are grouped as - (i) environmental problems which include (a) light supply, (b) heat and temperature, (c) rainfall, (d) humidity, (e) wind factor, (f) altitude & slopes , (g) soils and (h) insect, pests and diseases; (2) Practice to induce fruiting problems which include (a) Pollination, (b) mulching of soil , (c) fertilizer, (d) root pruning and (e) bending system; (3) Locational problems, (4) post harvest problems. Problems in floriculture and vegetable. Summerizing it is observed that the problems regarding horticulture is both qualitative and quantitative. Quality of the sproduct is very much governed by weather conditions, Growers are always sensitive about natural calamities like, flood, drought, cyclonic storms, heat waves, hailstorms, foggy weather etc. Soil erosion and loss of plant nutrients due to surface run-off as a resuslt of overflooding as well as successive drought period cause loss of crops in every alternate two or three years. Quantitative loss is due to delay in transit system, unsuitable mode of transport, injuries during transhipment and defective packing systems. Space in cold storage for these highly perishable items is a serious problem and causes immense loss. Under normal circumstances horticultural products travelling shorter distance take shorter time and suffer less quantitative loss. Keeping view with all these problems a detailed analysis have been studied in the following chapter, regarding planning and development of horticulture in West Bengal.