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CLIMATE AND SOIL FOR HORTICULTURE CROPS



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CLIMATE:

Climate is the most important factor on which choice of the crop for a region depends and therefore, understanding about climate and its requirement for different crops for optimum production on sustainable basis is important for horticulturists.

Light

- The light intensity can be estimated from the number of hours of bright sunlight or from the cloudiness of sky.
- Generally horticultural crops need a lot of light and must be grown in sunny climate, but there are some crops which can tolerate shade e.g. turmeric and ginger.
- There are others like young mangosteen, coffee, cocoa and tea need shade during part of their development.
- A third group requires permanent shade like salak palm, duku, and carambola



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Based on temperature variation on surface of earth climate is classified broadly into three categories

a) Tropical- Climate with no distinct winter

Eg: Mango, Banana, Papaya, Sapota, Pineapple, Coconut, Cashew, Arecanut, Breadfruit, Jackfruit and Avocado

b) Subtropical- Climate with distinct summer and winter

Eg: Guava, Grape, Citrus, Date palm, Phalsa, Pomegranate, Litchi and Loquat

c) Temperate- Distinct winter, summer and autumn with temperature below freezing during winter is common.

Eg: Apple, Pear, Peach, Plum, Quince, Apricot, Walnut, Almond, Strawberry and Cherry



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Based on the response by plants are classified as follows:

- **Long day plants:** Cabbage, Cauliflower, Onion, Beet, Radish, Carrot, Spinach, Potato, Dill and Plantago.
- **Short day plants:** Strawberry, Pineapple, Chrysanthemum, Poinsettia, Aster, Balsam, Salvia, Euphorbia and Xanthium.
- **Day neutral plants:** Tomato, most fruit crops, Pepper, Cucumber, Snapdragon, Mirabilis and certain varieties of peas



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SOIL:

Soils in India are classified into 8 categories:

- Alluvial Soil
- Black cotton soil
- Red soil
- Laterite soil
- Forest/Mountaineous soil
- Arid or Desert soil
- Saline and alkali soil
- Marshy soil



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Alluvial soil:

- Found in the valleys of the Narmada, Tapi and in the Eastern and Western coastal plains.
- These soils are mainly derived from the debris brown from the Himalayas.
- This soil is well-drained and poorly drained with an immature profile in undulating areas.
- This soil has potash deficiency.
- The colour of soil varies from light grey to ash

Red soil:

- They are mainly found in the Peninsula from Tamil Nadu in the south to Bundelkhand in the north and Raj Mahal in the east to Kathiawad in the west.
- This soil is also known as the omnibus group.
- The presence of ferric oxides makes the colour of soil red. The top layer of the soil is red and horizon below is yellowish.
- Generally, these soils are deficient in phosphate, lime, magnesia, humus and nitrogen.
- **This soil is good for the cultivation of wheat, cotton, pulses, tobacco, millets, orchards, potato, and oilseeds.**



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Black soil:

- Black soil is also known cotton soil.
- This soil is formed from rocks of cretaceous lava. This stretch over the parts of Gujarat, Maharashtra, Western parts of Madhya Pradesh, North- Western Andhra Pradesh, Karnataka, Tamil Nadu, Rajasthan, Chhattisgarh, Jharkhand up to Raj Mahal hills.
- The soil is rich in iron, lime, calcium, potash, magnesium and aluminium.
- It has high water retaining capacity and good for the cotton cultivation, Tobacco, citrus fruits, castor, and linseed.



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Desert soil:

- Soil is deposited by wind action and mainly found in the arid and semi-arid areas like Rajasthan, West of the Aravallis, Northern Gujarat, Saurashtra, Kachchh, Western parts of Haryana and southern part of Punjab.
- They are sandy with low organic matter.
- It has low soluble salts and moisture with very low retaining capacity.
- If irrigated these soil give a high agricultural return.
- These suitable less water requiring crops like Bajra, pulses, fodder, and guar.



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Laterite soil:

- Found mainly in the hills of the Western Ghats, Raj Mahal hills, Eastern Ghats, Satpura, Vindhya, Odisha, Chhattisgarh, Jharkhand, West Bengal, North Cachar Hills, and the Garo hills.
- These are poor in organic matter, nitrogen, potassium, lime and potash.
- These iron and aluminium rich soils are suitable for the cultivation of rice, ragi, sugarcane and cashew nuts.



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Mountain Soil:

- These soils have less developed soil profile and mainly found in the valleys and hill slopes of Himalayas.
- These soils are immature and dark brown in colour.
- This soil has very low humus and it is acidic in nature.
- The orchards, fodder, legumes are grown in this soil.



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Red Soil:

- Granite, gneiss and quartzite of Precambrian and Archean era.
- This soil performs well if irrigated.
- Generally, this soil has very less productivity.

Marshy Soil:

- Soil originates from the areas where adequate drainage is not possible.
- It is rich in organic matter and has high salinity. They are deficient in potash and phosphate.
- These mainly found in Sunderbans delta, Kottayam, and Alappuzha districts of Kerala, Rann of Kachchh, deltas of Mahanadi etc.



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Saline and alkali soil:

- These are also called as Reh, Usar, Kallar, Rakar, Thur and Chopan.
- These are mainly found in Rajasthan, Haryana, Punjab, Uttar Pradesh, Bihar and Maharashtra. Sodium chloride and sodium sulphate are present in this soil.
- It is suitable for leguminous crops.



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THANK YOU