Injuries and Humidity

HEAT INJURIES

Thermal death point"(50-60°C.) – the temperature at which the plant cell gets killed.

1. Sun clad

- Injury caused on the barks of stem by high temperature during day time and low temperature during the night time.

2. Stem griddle

- The stem at ground level scorches around due to high soil temperature.
- It is common in young seedlings of cotton in sandy soil when soil temperature **exceeds 60°C.**

COLD INJURY

If Temp <20°C then cholratic bands on the leaves of sugarcane, sorghum and maize in winter months.

3. Freezing injury

- Most in temperate regions
- Protoplasm of cell is dehydrated resulting in the death of cells. (e.g.) Frost damage in potato, tea etc.

4. Suffocation

- In temperature regions, usually during the winter season, the ice or snow forms a thick cover on the soil surface.
- Oxygen is prevented and crop suffers for want of oxygen and prevents the diffusion of CO2 outside the root zone.
- This prevents the respiratory activities of roots leading to accumulation of harmful substances

5. Heaving

- This is a kind of injury caused by lifting up(mechanical lifting) of the plants along with soil from its normal position.
- Common in temperate region

HUMIDITY

The amount of water vapour that is present in atmosphere is known as atmospheric moisture or humidity.

1. Absolute humidity

- The actual mass of water vapour present in a given volume of moist air.

2. Specific humidity

- Weight of water vapour per unit weight of moist air.
- Grams of water Vapour per kilogram of air (g/kg).

3. Mixing ratio

- The ratio of the mass of water vapour contained in a sample of moist air to the mass of dry air.
- gram of water vapour per kilogram dry air.

4. Relative Humidity

- The ratio between the amount of water vapour present in a given volume of air and the amount of water vapour required for saturation under fixed temperature and pressure.
- The relative humidity of saturated air is 100 per cent.

5. Dew Point temperature

- The temperature to which a given parcel of air must be cooled in order to become saturation at constant pressure and water vapor content.

6. Vapour Pressure deficit

- The difference between the saturated vapour pressure (SVP) and actual vapor pressure (AVP) at a given temperature.

Light

Light is the visible portion of the solar spectrum with wavelength range is from 0.39 to 0.76

Quality of Light- The different colors and their wave length are as follows-

1. Violet :400-435 m micron
2. Green:490-574m micron
3. Orange : 595-574m micron
4. Blue: 435m micron

5. Yellow: 574-595m micron

6. Red: 626-750m micron.

- Ultra-Violet and shorter wave lengths kill bacteria and many fungi.
- Red light favorable for growth followed by violet -blue.
- Infrared detrimental to plant growth.

Based on the response to light intensities the plants are classified as follows

1. **Sciophytes (shade loving plants)**

- Betel vine, buck wheat ETC

2. **Hetrophytes (Sun loving)**

- Maize, sorghum, rice etc.

Light intensity:

- The intensity of light is measured by comparing with a standard candle. About 1% of the light energy is converted into biochemical energy.
- Very low light intensity reduces the rate of photosynthesis resulting in reduced growth. Similarly, very high intensity is detrimental to plant in many ways as below.
- It increases the rate of respiration.
- The most harmful effect of high intensity light is that it oxidizes the cell contents which are termed as 'Solarisation'. This oxidation is different from respiration and is called as photo- oxidation.
- Red light is the most favorable light for growth followed by violet - blue. Ultra-violet and shorter wave lengths kill bacteria and many fungi.

Blue color of the sky

1. **Rayleigh scattering (Primary cause)**

   Circumference of the scattering particle is -< 1/10

Red Color of the sky at sunset & sunrise

Increased path length in the atmosphere. % of solar energy in the visible part decreases.