

1(c). Basic aspect of temperature and their application in crop production (Dr.T.N. Balasubramanian)



Air temperature has important role on plant growth and development at all stages(enzymes ,hormones, cell division and their multiplication).

Types of temperature in crop production

a. Air Temperature

- Maximum temperature
- Minimum temperature
- Mean temperature

b. Soil temperature

c. Cardinal temperature



Cardinal temperature for germination of seeds of selected crops(°C)

Crops	Minimum	Optimum	Maximum
Wheat	3- 4.5	25	30-32
Barley	3- 4.5	20	38.40
Oats	4- 5	25	30
Maize	8-10	32-35	40-44
Sorghum	8-10	32-35	40
Rice	10-12	30-32	36-38
Tobacco	13-14	28	35

Heat wave(°C)

Category	Deviation from Normal
Normal	(-)1to + 1° C
Above normal	+2° C
Appreciably above normal	+3 to 4° C
Moderate heat wave	+5 to 6° C
Severe heat wave	+7° C and above

When the normal maximum temperature of the area is 40° C or less

Cold wave(°C)

Category	Departure from normal
Normal	(-) 1 to +1° C
Below normal	(-)2° C from the normal
Appreciably below normal	(-) 3 to 4° C from the normal
Moderate cold wave	(-)5 to 6° C from the normal
Severe cold wave	(-) 7° C from the normal and below

When the normal minimum temperature of the area is 10°C or more

Instruments used for measuring temperature

- Maximum thermometer
- Minimum thermometer
- Thermograph
- Infrared thermometer
- Grass minimum thermometer
- Soil thermometer

Temperature Units

Degree Celsius($^{\circ}\text{C}$)

Degree Fahrenheit($^{\circ}\text{F}$)

Kelvin or Absolute Zero(This is the point at which at which a gas would cease to exert any pressure)

Conversion

$$C = \frac{5}{9}(F - 32)$$

$$F = (C * \frac{9}{5}) + 32$$

In absolute scale °0 C becomes 273A

It means 20°C is equal to 20 + 273
= 293A