PLANT GROWTH AND DEVELOPMENT
PLANT GROWTH REGULATORS

PHOTOPERIODISM

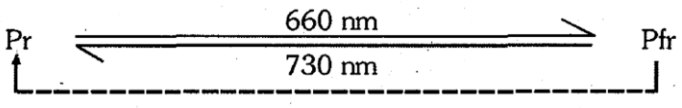
- Flowering in certain plants depends not only on a combination of light and dark exposures but also their relative durations. This response of plants to periods of day/night is termed as photoperiodism.
- This phenomenon was discovered by Gamer and allard in maryland mammoth (a mutant variety of tobacco) and blloxy soyabean.

MECHANISM :

- Appropriate light/dark duration perceived by leaves with the help of a proteinaceous pigment (chromoprotein) called phytochrome.
- After suitable exposure a hypothetical hormonal substance (florigen) migrates from leaves to shoot apices for inducing flowering.
- Ultimately shoot apices modify into flowering apices.

Phytochrome : It is a chromoprotein pigment located on cell membrane. Phytochrome exists in two interconvert able forms :

(a) P_r (phytochrome red) (b) P_{fr} (phytochrome far red)



Garner and Allard based upon response of plants to periods of day/night, classified plants into following groups :

1. **Long Day Plants (LDP):** These plants perform flowering by receiving long photoperiod (above the critical period) **e.g. Spinach, Radish, Lettuce, Wheat, Oat, Henbane.**

2. **Short Day Plants (SDP):** Flowering occurs below the critical period of day length. Short day plants require a continuous critical dark period for flowering therefore they are also called long night plants. If the SDP plant is exposed to even a flash of light before achieving a critical dark period, flowering is prevented. **e.g. Xanthium (Colcklebur), Chrysanthemum, Cosmos, Aster, Rice, Sugarcane, Strawberry, Potato, Tobacco, Soyabean varieties.**

3. **Day Neutral or indeterminate Plants (DNP) :** Flowering is not affected by photoperiod or day length. **e.g. Maize, Cotton, Tomato, Black Pepper, Cucumber, Sunflower.**

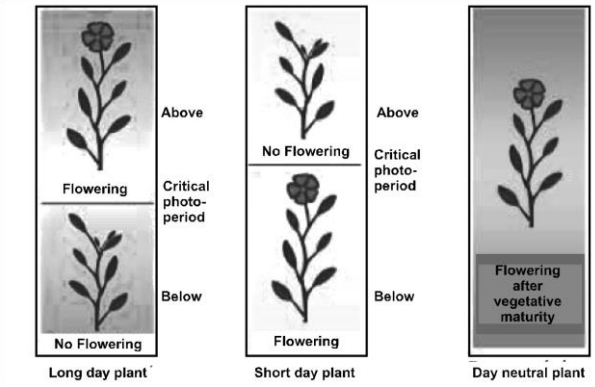


Fig : Photoperiodism : Long day, short day and day neutral plants