

Topic: Vernalization
B.Sc. Botany (Sub.) II
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Temperature plays significant role in metabolic activities of plants. Temperature is one of the important factors determining the distribution of plants. Temperature also plays vital role in the germination of seeds and subsequent flowering of plants. Plants of temperate zone, as expected, germinate at a relatively low temperature, whereas tropical plants germinate best at much higher temperature.

Development and flowering in many temperate plants can be altered by subjecting moistened seeds to low temperature, a practice known as Vernalization, with the help of vernalization plants may be made to flower earlier than usual. An example of winter rye may be quoted here.

When the seeds of this variety of rye were germinated at 1°C for four weeks, the plants flowered eleven weeks after planting, but at the same time seeds germinated at 18°C did not produce flowering shoot in the same duration.

Another interesting fact about the effects of vernalisation came from the work on biennial varieties of *Hyoscyamus niger* (herbane) by Melchers and Lang (1948).

This variety of herbane will flower only when vernalization is followed by long day treatment and vernalization followed by short day treatment fails to induce flowering.



Still more interesting is the fact that annual variety of henbane does not require cold treatment for flowering. The annual variety differs from biennial ones in the possession of a single dormant gene which functions as a substitute to vernalization. It is presumed that the said gene brings about direct production of the precursor of flowering substance, which in the biennial variety requires cold treatment. These findings indicate the possibility of conversion of certain hormone precursor into a flower-inducing active form which under the influence of appropriate day-length induces flowering.

Vernalization has proved to be of great economic importance. In cereals where both winter and spring varieties are known, the winter varieties often produce a much heavier crop of flowers and therefore give a better yield than spring varieties. Winter varieties can be made to grow during spring season by giving appropriate cold treatment to their seeds at the time of germination.

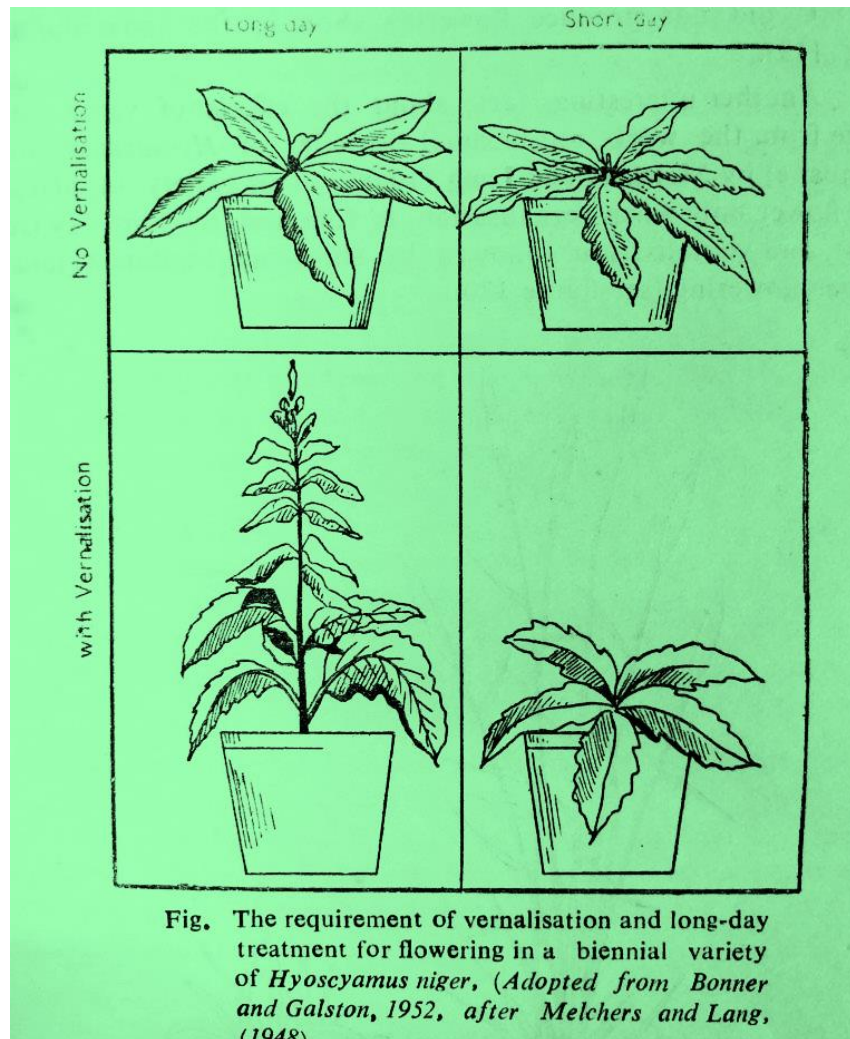


Fig. The requirement of vernalisation and long-day treatment for flowering in a biennial variety of *Hyoscyamus niger*, (Adopted from Bonner and Galston, 1952, after Melchers and Lang, (1948).