**Floral initiation of sesame as affected by photoperiod and temperature**

Pornparn Suddhiyam, B.T. Steer, and D.W. Turner

Tropical Crops and Crop & Pasture Science Groups, School of Agriculture, The University of Western Australia, Nedlands, WA 6009

Sesame is an important tropical oilseed crop. It grows poorly at temperatures below 20?C (2) and is a quantitative short day plant (1). The interaction between photoperiod and temperature and their effects on floral initiation are reported here.

Preliminary experiments showed that sesame plants can respond to short photoperiods as soon as they emerge (at the cotyledon stage) and flowering is accelerated after exposure to only one short day cycle.

**Materials and Methods**

Two photoperiods (8, 15 h), three temperature regimes (18/13, 20/15 and 25/20?C day/night) and six varieties were used. The 15 h treatment consisted of 8 h daylight and 7 h supplementary light which was from a 60 W incandescent bulb. The days after sowing when the first floral bud appeared (DFF) and node at which it appeared were recorded. Two experiments to determine the effect of planting date on floral initiation of Aceitera and Hnan Dun were carried out in 1987 and 1988. In another experiment, twenty varieties from different origins were studied in three photoperiods (8, 13 and 15 h).

**Results and discussion**

The plants grew poorly at 18/13?C in both 8 and 15 h conditions and many died before initiation of flowers, but the survivors initiated flowers more rapidly in 8 than in 15 h photoperiods.

There was a significant interaction between photoperiod, temperature and variety on DFF (Table). In 20/15?C the difference in DFF between 8 h and 15 h photoperiods was more pronounced than at 25/20?C. Floral initiation occurred 4-6 days later in long days than in short days at 20/15?C, but it occurred at the same time in 25/20?C in both photoperiods. The node at which the first floral bud appeared usually differed between temperature and variety but not between photoperiods.

**Table Flowering response in 6 varieties from 5 countries.**

| | DAS first floral bud appeared | | | | Node of first floral bud | |
|---|---|---|---|---|---|---|
| Varieties and their | 20/15°C | | 25/20°C | | 20/15°C | 25/20°C |
| origin | 8 h | 15 h | 8 h | 15 h | Means of both photoperiods | |
| Aceitera (Venezuela) | 30.0de | 35.5b | 22.2f | 20.6f | 2.8bcd | 2.3def |
| Hnan Dun (Burma) | 31.0cd | 27.7e | 22.4f | 21.0f | 2.5f | 2.7bcde |
| Pachequino (Mexico) | 36.1b | 42.9a | 22.9f | 16.9g | 3.5a | 2.6cdef |
| Takli (Thailand) | 31.9cd | 36.4b | 21.9f | 22.2f | 3.2ab | 2.9b |
| Suweon 21 (Korea) | 33.6bc | 35.0b | 23.6f | 22.4f | 2.9bc | 2.9bc |
| Kwang sanggae (Korea) | 30.2de | 31.8cd | 22.5f | 22.6f | 2.8bcde | 2.3ef |

In the planting date experiments, floral initiation became earlier as the photoperiods at emergence increased from 11.5 to 12.5 h in 1987 and from 10.3 to 11.5 h in 1988. At longer photoperiods, initiation was slightly delayed in both years.

Floral initiation was accelerated in short photoperiods in all 20 varieties. Between varieties there was more variability in the DFF in long than in short photoperiods. The 20 varieties were grouped using cluster analysis using their DFF and the node of the first floral bud.

Most varieties are quantitative short day plants, and flowering occurs earlier at high temperatures.

1. Sinha, S.K., Tomar, D.P.S. and Deshmukh, P.S. 1973. Ind. J. Genet. Pl. Breed. 33: 293-6.

2. Weiss, E.A. 1971. "Castor, Sesame and Safflower." Leonard Hill, London.