FLOWERING RESPONSE OF FOUR BEAN (*Phaseolus vulgaris* L.) VARIETIES

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For a photoperiodic plant to be induced to flower, it must: (i) reach sufficient maturity for the response, (ii) be subjected to an appropriate photoperiod, (iii) receive that photoperiod for a sufficient number of cycles.

The objective of the present study was to determine the photoperiodic response of four bean varieties under greenhouse conditions.

MATERIALS: The following varieties were grown in one-liter containers: Cacahuate-72 (C) (Habit-type I, according to Debouck and Hidalgo, 1985), Michoacán 12-A-3 (M) (Habit-type II), Flor de Mayo (FM) (Habit-type III) and Negro 150 (N) (Habit-type IV).

RESULTS: Response type: The plants were subjected to extreme (8 and 24 h daily) photoperiods (PhP), beginning at emergence. C and M were insensitive to PhP. Anthesis occurred at 29 days after emergence (DAE) for C and 45 DAE for M. FM and N were short day varieties: for anthesis, FM needed 42 DAE (at 8 h PhP) and 74 DAE (at 24 h PhP); N needed 49 DAE (at 8 h PhP) and more than 120 DAE at 24 h PhP. These results agree with the relation between habit type and type of PhP response reported by White and Laing (1989) in an investigation where more that 4000 bean varieties were screened.

Number of inductive cycles necessary to develop flower buds: To determine this character, plants were grown under noninductive 24 h PhP from emergence to the four-node stage. Subsequently they were subjected to inductive 8 h PhP during a variable number of cycles. It was determined that, in order for 100 per cent of the plants to develop flower buds at 15 d after the last inductive PhP, FM required 12 inductive cycles and N, 8 cycles. However, if returned to noninductive PhP, the flower buds abscissed. Therefore the development from flower bud to anthesis required continued inductive cycles. The total number of cycles, after the first inductive cycle, needed for 50 per cent of FM plants to reach anthesis, was 30, while that needed for N was 25 cycles.

Critical length of inductive cycles: We consider that the critical length of inductive PhP is that in which 50 per cent of the plants, given the necessary number of inductive PhP, produce visible buds within 15 d after the last inductive cycle. Four-node seedlings of N received the necessary number (8) of inductive cycles of different lengths of PhP. The day/night temperatures were 25/15° C. It was determined that the critical length of PhP was 13 h. This short day response of N agrees with the criterion that short day plants are those which flower or accelerate their flowering under a PhP shorter than the critical PhP. For FM, the critical length of the PhP has not yet been determined.

LITERATURE CITED

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