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Why Stubborn Chrysanthemum Varieties?

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Flowering of thermonegative varieties of chrysanthemums (N. Y. S. F. G. Bul. #104, 112) depends upon the temperature not being over 60°F during bud development. Temperature below 60°F results in a delay of the initiation of flowers. Higher temperatures (above 60-70°F) inhibit flower development. This study was made to determine the effect of the time of year on the start of short day treatment on the flowering of thermonegative varieties.

Revelation, a 15-week variety in natural season, was selected as a typical thermonegative variety. Stock plants were grown at a minimum night temperature of 60°F. Four-inch cuttings were taken at various times of year. The cuttings were rooted in Vermiculite under mist (Langhans, 1954). They were benched 7 1/2 x 4", given thirty long days followed by short days to flower. Under one treatment, the plants were grown in four-inch pots.

The following important dates were recorded: when short days were started, when the buds showed color, when the flowers were open. Bud initiation was considered from start of short days to visible buds. Bud development was from the date the buds showed until flowers were cut. Flowering time was from the start of short days to full bloom.

Effect of Time of Year on Start of Short Days

Plants subjected to short days did not develop their flower buds until the temperature dropped to 60°F. The night temperature was down to 60°F for at least four hours beginning August 31, 1954, 60°F for eight hours not until October 16, 1954. The short day treatment starting October 6 flowered in 103 days. Delaying the start of short day treatment until October 26, the variety flowered in 97 days. This showed that the temperature was not low enough to rapidly flower the variety until around October 16. Short day treatment prior to October 16 had no effect on flower development, crown bud followed by crown bud were formed.

Bud initiation occurred throughout the year but the development of florets required a lower temperature (60°F). This lack of development of the buds resulted in compound sprays which flowered with twice the number of flower buds.

Effect of Time of Start of Short Days on Flowering of Thermonegative Variety Revelation

Start Short Days	Flower	Number Days	Number Flowers	Spray Type
Jan. 5	Apr. 11	86	11	terminal
Feb. 11	May 19	97	13	terminal
March 3	June 10	86	14	terminal
May 4	Never	Plants	Removed	
July 20	Jan 5	169	33	compound
Aug. 5	Jan. 5	152	29	compound
Sept. 15	Jan. 5	112	34	compound
Oct. 6	Jan. 17	103	15	terminal
Oct. 26	Feb. 1	97	13	terminal
Dec. 7	March 23	90	12	terminal



Effect of Night Temperature

To test if temperature primarily controlled flowering of this variety, short days were started July 7, 1954 under high light and temperature conditions. One lot of plants were moved into a 55°F refrigerator for the dark period from 5 p. m. to 8 a. m. Other plants were grown at a minimum night temperature of 60 and 80°F, with a dark period from 5 p. m. to 8 a. m.

The 55°F night temperature caused flowering in 13 weeks with short compound sprays. The plants grown in the 60°F greenhouse flowered after 24 weeks of short days which was the natural flowering date. This showed that even under higher light and temperature conditions in the summer the variety could be flowered if the night temperatures were low (60°F) consistently.

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As similar treatment, given under the lower light and temperature conditions of the winter resulted in 55° F treatment flowering in 15 weeks, 60° F in 13 weeks. The plants grown at 80° F never flowered.

Effect of Night Temperature-Variety Revelation

Short Days Started 7/7/54

	<u>Left to Right</u>	<u>Flowers</u>	<u>Days from Start SD</u>
55°	Refrigerated Night	10/6/54	91
60°	Greenhouse	1/5/55	182
80°	Greenhouse	Never	---

What Can We Learn From This?

1. Minimum flowering was obtained with this variety when 60° F was continued throughout the life of the plant. Initiation of buds occurred over the whole range of temperature but flowers developed when the temperature was 60° F or below.
2. Compound sprays in natural season was primarily due to the high temperature which prevented the development of the flower buds. It resulted in the

initiation of buds followed by crown buds.

3. Short days had no effect on the development of flower buds until the temperature was down to at least 60° F for a large part of the night.

On many varieties with heat delay, the application of black cloth has no benefit and actually may be disadvantageous due to the heat trap of the cover. Thermopositive and thermozero varieties show similar responses but the temperature must be above 80° F.

4. High light intensity had little effect on the flowering of the variety when the night temperature was controlled by placement of the plants in a refrigerator.

Literature Cited:

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