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Temperature Guide to Chrysanthemum Varieties

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Temperature was shown to alter the effectiveness of short days (9 hours) in flowering chrysanthemums (N. Y. S. F. G. Bul. #104, 112, 116). Three distinct temperature response groups were described:

- 1) Thermozero varieties formed buds at any temperature;
- 2) Thermopositive varieties, flowered at temperatures of 60°F or above;
- 3) Thermonegative varieties were prevented from flowering above 60°F.

This study was conducted to determine the effect of temperature (50, 60, 80°F) when the varieties flowered in spring, fall and winter.

The varieties were selected after consultation with Mr. Cloy Miller at Yoder Brothers, Barberton, Ohio. The cuttings were obtained through the courtesy of Yoder Brothers. They were planted 4 x 6 inches on July 7, 1954; October 14, 1954; and January 15, 1955. The plants were grown at a minimum night temperature of 60°F with long days. The growing points were removed from the plants after 15 days; long days were continued for thirty days. Short days (9 hours) were started respectively on August 23, 1954; December 1, 1954; and March 1, 1955. With the January 15 planting cuttings were placed at 50 and 80°F as well as 60°F minimum night temperature. Control of the night temperature was not possible after 80 days. The experiment was discontinued after 120 days.

The following dates were recorded: when short days were started, when the flowers first developed color on the outer florets, when the flowers were open (center florets separated). The sprays were graded,

Appreciation is expressed to F. F. Horton and staff in the culture and to Mrs. Sophia Wilkin in the collection of the data.

using the CSW grades. The number of leaves and flowers per spray and the type of spray were recorded.

Thermozero Varieties

The variety Shasta gave little response to temperature. Typically, the variety flowered in the minimum time at 60°F with equal delay when grown at either 50 or 80°F. Growth at low temperature did not appreciably decrease the number of flowers on a spray or cause the formation of compounded sprays.

Thermopositive Varieties

The variety Encore was inhibited in flowering below 60°F. Low temperature (50°F) caused the formation of crown buds followed by crown buds. The center flower bud often developed color but flowering was greatly retarded in comparison to the plants grown at 60°F. The initiation of crown bud subtended by short terminal sprays occurred at high temperature (80°F). Grown at 80°F, it flowered at almost the same time as at 60°F.

Some varieties are delayed in flowering (N. Y. S. F. G. Bul. #112) if stock plants are grown below 60°F. These varieties flowered uniformly and exhibited no delay when grown at 80°F. Delayed flowering and great variation in the spray formations was produced on these plants if grown at 60°F.

Thermonegative Varieties

The variety Revelation was inhibited in flowering by temperature above 60°F. Flower buds were formed in all temperatures (50-80°F) but continued high temperature caused the formation of crown buds followed

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by crown buds (N. Y. S. F. G. Bul. #116). The sprays formed at low temperature (50°F) were terminal, but flower development was retarded.

The use of this information in a chrysanthemum production program for flowering for specific dates should include the consideration of these points:

1. Time of year at which growth, the formation and development of the flower is to occur. Certain varieties gave more response to changes in the time of year than others.
2. Different colored varieties with similar temperature response should be grown together.

3. Selected varieties can be grown with crops of special temperature requirements. Examples are: thermozero varieties in carnation houses; early thermopositive varieties in temporarily unused rose bench space during renewal of the plant.

4. Low temperature hastened the development of flowers once they were started. Varieties planted in late fall, in cool climates, should react as thermozero.

5. Some varieties should not be included in any schedule outside of natural season due to the unpredictable results obtained. They were: Heritage, Shamrock, Snowline, Smith's White, Meteore.

Thermozero Varieties (Temperature Insensitive)--Days to Flower

Variety	Flowering Date	Description	80	Minimum night temperature °F			Winter 60
				Spring 60	50	Fall 60	
Azetec	Oct. 28	Yellow single	80	67	73	61	62
Belray	Nov. 24	White pompon	80	67	79	65	64
Bluechip	Nov. 1	Pink pompon	70	67	84	61	62
Buckskin	Oct. 25	Bronze single	70	63	76	59	64
Citation	Oct. 15	Pink pompon	67	63	79	61	57
Golden Herald	Oct. 25	Yellow decorative	70	67	81	63	59
Halo	Nov. 1	Ivory white single	70	67	79	61	64
Ind. White	Nov. 5	White standard	73	73	82	62	66
Ind. Yellow	Nov. 5	Yellow standard	73	73	82	61	66
Ivanhoe	Nov. 1	Bronze standard	80	80	94	65	71
Mary L. Hall	Nov. 1	Yellow pompon	57	67	79	57	62
Mrs. DuPont	Oct. 12	Coral buff. lg. dec.	63	63	79	57	57
Pink Chief	Oct. 15	Lavender standard	70	67	79	59	57
Pinkette	Oct. 25	Pink pompon	67	67	73	61	57
Prelude	Oct. 24	Coral pink single	70	67	79	59	62
Reward	Oct. 25	Pink single	67	63	67	59	57
Sauterne	Oct. 30	Yellow single	80	67	84	61	62
Shasta	Nov. 10	White anemone	85	80	85	67	73

Thermonegative Varieties (Low Temperature to Develop)--Days to Flower

Variety	Flowering Date	Description	80	Minimum night temperature °F			Winter 60
				Spring 60	50	Fall 60	
Acclaim	Dec. 5	White pompon	C	81	D	83	83
Christmas Greeting	Dec. 15	Crimson decorative	A	102	B	97	87
Christmas Star	Dec. 12	Scarlet single	A	92	C	89	87
Corsair	Dec. 10	Large yellow	A	92	C	90	85
Cotillion	Dec. 5	White pompon	B	84	D	83	85
Debutante	Dec. 10	Pink single	A	102	B	89	85
Heirloom	Dec. 20	White decorative	A	81	D	97	90
Holiday	Dec. 10	Crimson single	A	84	B	89	83
Mahogany Viking	Dec. 5	Bronze single	A	92	C	90	89
Medallion	Dec. 20	Pink pompon	A	84	D	97	87
Merrymaker	Dec. 20	Scarlet single	C	92	D	92	83
Minstrel	Dec. 13	Pink pompon	A	92	B	97	87
Poinsettia	Dec. 20	Scarlet single	A	92	D	91	87
Riviera	Dec. 15	Pink decorative	A	84	D	100	101
Rosalind	Dec. 20	Pink single	C	84	D	81	90
Silver Smith	Dec. 15	White decorative	A	81	D	100	85
Siren	Dec. 25	Yellow decorative	A	107	B	119	118
Snowcap	Dec. 15	White pompon	C	84	D	100	85
Snowcrest	Dec. 15	White pompon	A	81	C	119	85
Vibrant	Dec. 20	White decorative	C	92	D	100	102
Yuleflame	Dec. 25	Yellow decorative	A	92	D	97	104

- A - Crown bud followed by crown bud
- B - Terminal spray, slow development of flowers
- C - Center flowers in spray developing slowly. Crown buds followed by crown buds lower down the stem
- D - Terminal spray, almost in flower
- E - Delayed flowering

Thermopositive Varieties (Do Well at High Temperature)--Days to Flower

Variety	Flowering Date	Description	Minimum night temperature °F				Winter 60
			80	Spring 60	50	Fall 60	
Albatross	Nov. 1	White	67	73	92	61	66
Almega	Nov. 20	Lavender pompon	92	80	D	78	76
Arbutus	Nov. 1	Pink pompon	73	77	C	69	68
Beauregard	Nov. 5	Orange pompon	73	77	102	69	71
Blazing Gold	Oct. 23	Yellow	67	67	92	47	66
Bonn. Deluxe	Nov. 20	Yellow incurved	92	81	D	69	76
Brigadoon	Nov. 5	Yellow single	80	73	B	67	64
Bright Forecast	Oct. 10	Yellow pompon	63	63	A	59	59
Buccaneer	Nov. 1	Orange single	73	67	120	61	64
Carrara	Dec. 8	White decorative	92	73	C	78	83
Chevron	Nov. 10	Orange decorative	73	67	120	59	64
Constellation	Nov. 5	Yellow decorative	81	77	A	74	71
Crescendo	Nov. 5	Yellow pompon	73	81	A	71	73
Crystal Queen	Nov. 10	White	92	77	D	71	76
Dark Orchid Queen	Nov. 10	Pink	84	80	120	63	66
Dynamo	Nov. 10	White pompon	73	81	A	63	66
Ed Seidewitz	Nov. 23	Lavender	102	92	D	78	83
Encore	Nov. 5	White pompon	67	73	A	61	66
Fortune	Dec. 1	White pompon	102	102	A	78	85
Forty-Niner	Nov. 15	Yellow pompon	74	81	C	69	83
Garnet King	Nov. 13	Red	73	81	C	65	83
Giant Betsy Ross	Nov. 5	White	80	84	A	61	62
Gold Coast	Oct. 25	Yellow pompon	70	63	102	57	62
Golden Chord	Nov. 15	Yellow pompon	84	84	A	67	71
Golden Pearson	Nov. 25	Yellow	107	81	A	78	83
Goldenrod	Nov. 25	Yellow pompon	102	92	A	81	83
Goldsmith	Nov. 25	Yellow decorative	92	E	A	81	76
Good News	Nov. 1	Yellow	80	80	102	67	71
Harvester	Nov. 23	Yellow	115	92	A	83	83
Highbrow	Nov. 20	Ivory white	84	102	C	74	76
Highlander	Nov. 25	Yellow decorative	92	E	A	78	83
Hilarity	Nov. 1	Bronze single	59	63	120	57	59
Honeymoon	Nov. 4	Yellow single	73	77	C	61	66
Horizon	Oct. 5	White pompon	57	63	107	53	55
Ill. Formal	Nov. 23	Rose pompon	84	80	120	78	76
Ill. Igloo	Nov. 10	White pompon	73	73	107	61	73
Ill. Redwood	Nov. 25	Red pompon	102	102	A	83	83
Ill. Snowdrift	Nov. 12	Novelty white	80	73	C	63	66
Keepsake	Oct. 25	Cream pompon	57	67	A	59	62
Klondike	Nov. 20	Orange pompon	81	84	A	71	76
Linda Lou	Nov. 10	Yellow Cushion	81	77	D	74	75
Lollipop	Nov. 20	Yellow pompon	80	81	120	74	71
Lotus	Nov. 3	Pink pompon	73	77	A	71	64
Madonna	Nov. 5	White pompon	67	77	A	61	66
Marie Deptris	Nov. 25	Yellow incurved	102	115	A	83	101
Mary Garden	Nov. 1	Pink spider	67	80	A	51	66
Masterpiece	Nov. 12	Pink pompon	84	73	D	65	68
Mayfair	Oct. 15	Pink single	63	63	102	57	57
Mefo	Nov. 20	Ivory	102	92	D	76	83
Memorial	Nov. 12	Pink anemone	84	73	D	65	71
Minuet	Nov. 23	Pink pompon	92	73	A	78	76
Monument	Nov. 10	Ivory	84	80	120	61	66
Mrs. Dewey	Nov. 15	Bronze single	81	73	A		68
Mrs. Roy	Nov. 13	Red	80	77	D	63	73
Nerona	Oct. 15	White pompon	63	67	A	57	57
Omega	Dec. 1	Yellow pompon	107	92	A	83	83
Pacesetter	Nov. 10	White single	84	77	120	65	71
Paragon	Nov. 12	Red pompon	80	81	C	74	76
Paramount	Nov. 20	White pompon	92	80	A	78	76
Pennant	Nov. 10	Pink decorative	80	73	C	64	68
Pink Dot	Oct. 25	Pink pompon	67	67	A	61	66
Pinochio	Oct. 25	White pompon	57	63	B	55	59
Pippin	Nov. 20	Yellow pompon	92	81	D	74	73
Portrait	Nov. 8	Pink pompon	85	77	120	74	68
Priscilla	Nov. 20	White pompon	84	73	C	76	76
Pristine	Oct. 20	White pompon	57	61	102	59	59
Queen of Pinks	Nov. 10	Pink pompon	80	80	A	61	66
Queen's Lace	Nov. 1	White spider	73	80	102	61	73
Rainbow	Nov. 1	Coral pink single	67	67	107	59	62

Thermopositive Varieties--

Variety	Flowering Date	Description	Minimum night temperature °F				Winter 60
			80	Spring 60	50	Fall 60	
Royal Bronze	Nov. 1	Bronze incurved	80	73	C	61	66
Rubicon	Nov. 5	Bronze decorative	70	77	C	65	73
Sarong	Dec. 15	Crimson single	107	102	A	100	85
Sculpture	Nov. 15	Ivory single	81	73	D	69	76
Silver Sheen	Oct. 20	White incurved standard	63	63	84	53	62
Songster	Oct. 25	White pompon	57	67	A	55	62
Spellbound	Oct. 1	Pink decorative	57	63	107	53	53
Sunnyside	Nov. 25	Yellow pompon	92	E	A	83	76
Sunup	Oct. 28	Yellow pompon	57	63	102	59	62
Taffeta	Nov. 12	Pink decorative	84	80	C	71	75
Thanks Pink	Nov. 23	Pink	107	102	A	83	83
Thelma	Nov. 20	Orange pompon	92	80	A	78	76
Thyra	Nov. 10	Pink pompon	84	80	A	71	66
White Popcorn	Oct. 25	White pompon	57	67	A	61	62
Whitetop	Nov. 5	White decorative	80	77	C	65	71
White Valencia	Nov. 28	White single	102	84	C	78	83
Wilson's White	Nov. 1	White incurved	80	73	102	63	76

A - Crown bud followed by crown bud

B - Terminal spray, slow development of flowers

C - Center flowers in spray developing slowly. Crown buds followed by crown buds lower down the stem

D - Terminal spray, almost in flower

E - Delayed flowering