Constant Temperature

A study was initiated in the fall of 1959 to determine how 18 of the University of Minnesota varieties would react if grown in a greenhouse at a minimum temperature of 60° F. for two years. Stock plants from the field were moved into the greenhouse in late October, and cuttings were taken from new growth. The rooted cuttings were planted in 4-inch pots on February 5, 1960. There were 24 plants of each variety. In July, 1960 they were transplanted into 6-inch pots. No further transplanting took place during the study.

All plants were fertilized regularly and soil pH was maintained in a range between 6.0 and 7.0. On several occasions the plants were thinned to six shoots to prevent overcrowding. Following each flowering crop, the plants were cut back to a few inches from the soil line. Varieties included in the study were Chippewa, Dee Dee Ahrens, Dr. Longley, Glacier, Golden Fantasy, Harvest Bronze, Minnehaha, Minnbronze, Minnpink, Prairie Sunset, Princess, Purple Star, Redgold, Tonka, Violet, Vulcan, Wanda, and Wenonah.

All varieties bloomed by May, 1960. Blooming time per variety ranged from early March to May. Only half of the plants of the variety Prairie Sunset produced flowers. Plants of the variety Wanda were the tallest and Vulcan the next tallest. Wanda and Vulcan are not normally the tallest under field conditions. Plants of the variety Violet produced vigorous vegetative growth following early blooming.

All varieties bloomed once again in the fall of 1960. Blooming time ranged from early September through early November. Every plant of Minnbronze bloomed, but in varying degrees. Some plants were clusters of rosetted stems with just one or two short flowering stems. Other varieties produced more flowers but still showed considerable rosetting.

Although all varieties bloomed again in the spring of 1961, every plant showed considerable rosetting. Plants of five varieties, Dr. Longley, Minnbronze, Princess, Vulcan, and Wanda produced short thick rosetted growth and only an occasional flower. Plants of four varieties, Chippewa, Dee Dee Ahrens, Minnehaha, and Prairie Sunset, produced the tallest flowering shoots. With the remaining varieties, a limited number of flowering shoots were produced on each plant.

Flowers were produced on plants of all varieties again in the fall of 1961. Plants of Purple Star produced many rosetted stems and a few flowering shoots on each plant. Minnbronze plants were primarily clusters of rosetted stems with just an occasional short flowering stem on some plants.

The results showed that all varieties in the study made less satisfactory growth in the absence of exposure to low temperature. Minnbronze showed the most extreme symptoms. The exact length of exposure to low temperature required was not investigated. Chan (5) reported that three weeks at 42° F. was sufficient to change the growth of the variety Apache from a rosetted to a normal condition.