Florist Crop Research in '54

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Additional information on the reaction of chrysanthemums to temperature explains some of the growth responses previously unaccounted for.

Marc Cathey, graduate student in Floriculture, has proposed a temperature classification of chrysanthemums based on work with three typical varieties. The varieties are Encore, Shasta, and Revelation. Encore flowered in the minimum time if the stock and flowering plants were grown at temperatures above 60°F and at 60° to 70°F during the bud development stage. At temperatures below 60°F the initiation and development of flower buds was greatly delayed and initiation stopped completely at temperatures of 50°F regardless of day-length. This variety and varieties such as Dreamboat and Cameo, he called Thermo-positive because they require high temperature.

The variety Revelation (and Defiance) behaved quite differently. Here, temperatures of 60°F or below were necessary for proper bud development while continuous 60°F during the stock vegetative and flowering phases gave flowering in the minimum time. If the plants were grown at high temperature, 70°F or more, buds initiated but did not develop. At low temperature, flowering was delayed but eventually occurred. These varieties are called Thermo-negative because they require low temperature to develop.

The third class is Thermo-zero. In this case, temperatures are not so important. The variety Shasta was found to flower normally at all temperatures between 50°F and 80°F. There was some delay in the flowering at either extreme, the most rapid flowering occurring at 60°F. The delay was most pronounced (32 days) when the plants were grown at 50°F and shifted to 80°F for bud development.

This work explains why such varieties as Revelation, Encore, Dreamboat and Cameo are not satisfactory for spring-summer crops. It also points out the necessity for accurate temperature control in a year 'round chrysanthemum production schedule. Outdoor producers must use the above information in selecting varieties and the producers of new varieties are going to be asked about the temperature response of their varieties. Even Shasta may require almost five additional weeks to flower if temperatures are not controlled. Temperature alone can change a variety from a ten-week type to a fifteen-week variety.

Mist

The past year has seen a rather startling increase in the use of mist nozzles to produce a fog over cuttings and thus prevent water loss. Here again is a case of the commercial operators adopting a practice before the research is completed. Research, however, has not been limited to the use of mist for propagation where its advantages are obvious. Work this past year by Robert Langhans has shown that dormant rose plants can be started as late as July with very satisfactory results. This allows the cutting of the old plants for the late holidays and still will produce a big plant for the next fall.

Probably, a great deal of the benefits obtained from the use of mist are associated with the reduction in shade that can be made and the prevention of water loss; however, present research is related to the cooling effect of the water evaporation and the actual mechanical cooling due to water flowing over the leaves. It is also within the realm of possibility to feed the plants through the foliage via the mist and possible even to kill bugs and diseases the same way. The use of mist appears to have a very exciting future.

Peat Moss vs Manure

Peat moss is used in increasing amounts as a soil amendment and conditioner and manure is decreasing in popularity. I would like to believe that this is entirely due to my recommendations but realize that it may also be due to the increasing difficulty and expense of obtaining manure. In any event, those growers who have made the switch from manure to peat moss are mostly satisfied. In all cases, the recommendation has been to use the poultry-litter grade of peat moss as it improves the soil due to the large pieces as well as by its texture. When peat is substituted, one must fertilize more heavily right from the start as it offers no nutrients to the plant but does have a tremendous capacity to absorb fertilizer.

Low Temperature Conditioning

Low temperature conditioning of cut flowers has become an integral part of the marketing procedure for many growers. There is still some resistance on the part of wholesalers and retailers but this will decrease as their prejudices are overcome and as they see the results.

Cuttings, particularly carnations, are being stored in quantity under low temperature conditions. Some growers have been able to extend the storage period markedly by storing unrooted cuttings for a period of time, bringing them out for rooting and then placing the rooted cuttings back into storage for another period of time. Chrysanthemum cuttings can be stored at 31°F quite satisfactorily for periods up to one month. The low storage temperature does not induce delayed budding but on cuttings which came from low-temperature stock plants, there is some intensification of low-temperature delay. Cuttings produced at high temperature (July and August) do not store well.

Fertilizer and Soil Tests

Growers continue to convert to soluble fertilizers. This, of course, makes an appreciable saving in labor as the fertilizers can be applied with the watering. Soluble salts do not accumulate to such a degree and more uniform fertilization results.

The soil testing facilities in the Floriculture Dept. are being used by an increased number of growers. This has necessitated some changes in the operation of the laboratory so that the testing time does not become excessive. More changes are anticipated. Unfortunately, many growers wait until troubles become severe before calling in the advice of the college or the soils laboratory. If soil samples are sent in regularly, on a schedule, the need for haste in testing is not quite so great; although there will always be the unusual event which requires a rapid check.

Orchids

As time goes by, we find that orchid growing becomes less an art and more a science. Orchid growing is just now undergoing the revolution that struck

the rest of the greenhouse industry twenty years ago. This past year, experiments proved that orchids do best when watered frequently, as often as once a day. This, of course, assumes adequate drainage. The experiments mentioned incorporated Cattleyas, Cymbidiums, and Paphiopedilum. All responded equally well. We have also found that Cymbidiums and Paphiopedilum grow very well in peat moss. There is no merit in special or fancy mixtures for growing these crops as long as a fertilizer program is followed and the peat is kept wet. Practically all orchids will benifit from a regular fertilization.

What's New for 1955

We can continue to expect more and more growers to avail themselves of the soil testing facilities of the Floriculture Department and anticipate changing the lab procedure to maintain our present service. More growers will switch to the use of peat moss and soluble fertilizers and discontinue the use of organic fertilizers. More growers will find a way of working low temperature conditioning into their production schedule. There are enough growers now using the conditioning system to force their conservative brethren to meet the competition. Flower conditioning definitely gives the progressive grower an advantage in meeting peak market demands and in planning for most efficient production.

Mist systems of various sorts will be used in increasing numbers by growers for propagation, but it will not stop here. Already rose growers are planning installations for the starting of dormant buds. Undoubtedly, someone will make a large scale installation and find they can cool the greenhouse during the summer, eliminate shading and slow down some diseases and insects. We can anticipate some problems so don't get in too deep. As with anything new, try it on a small scale first and see how it will fit into your own particular operation.

Chrysanthemums are going to be given another workout this year. They will be reclassified by temperature effect and new varieties produced to fill special demands. Most of these new varieties will probably be screened for temperature response before release and I would not wonder if many of the new varieties will fall into the Thermo-zero classification. Future studies will probably explain the way in which temperature responses are inherited. This will be a valuable addition to the field of plant breeding.

Many of the above predictions will never come to pass; some new, unforeseen problems will arise, but we will still have the old problems with us. For many of these old problems, we do have answers. We try to give you the answers before you have the problem but don't always succeed. The main point here is to call for help before the problem is serious.