

Chrysanthemum Stunt and Stock Selection

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Apparently healthy stock plants selected at flowering time does not assure freedom from stunt. If a small percentage of stunt is in the variety or in other varieties on your place, you are likely to have stunt in much of your stock next year when propagated from that stock selected at flowering time.

On December 4, 1947 rooted cuttings of five varieties of chrysanthemums were planted. A study of photoperiod for winter production was started. The results of this experiment showed certain short photoperiods were very helpful in detecting stunt and marginal lighting was suggested for indexing plants. (N. Y. State Flower Growers' Bulletin 31, March 1948).

The plants were grown continuously at 60°F. They were pinched on December 20th and the artificial lights were discontinued February 1.

The plants flowered in early April. At this time they were labeled stunted or normal. The flowers were removed and the stock plants remained in the bench. They were allowed to produce vegetative shoots and some of these were pinched.

On June 24, 1948 each stock plant was removed from the bench and all the cuttings possible were taken. They were fastened to a label with a rubber band and within a few minutes were in vermiculite with the label. Cuttings from each plant were kept by themselves.

After the cuttings were rooted they were planted in a bench of sterilized soil and grown to maturity. Flowering was in normal season. Shortly before the flowers were cut each plant was examined for stunt.

RESULTS DISCOURAGING

It was assumed the stunted plants would produce stunted offspring and only a few stock plants of these were propagated. Cuttings were made from nearly all the normal plants.

* Plants for this project were obtained through the courtesy of Yoder Brothers, Barberton, Ohio. Anton Kofranek and Harry Kamemoto made the cuttings. Fred F. Horton, Greenhouse Superintendent, and his assistant helped take the records and cared for the plants during the growth period.

The variety Vesper was originally composed of 55 normal plants and 47 stunted ones. 292 cuttings were made from 52 of the normal plants.

35 normal stock plants produced 197 normal cuttings and no stunted ones.
11 normal stock plants produced 48 stunted cuttings and no normal ones.
6 normal stock plants produced 22 normal and 25 stunted cuttings.

Cuttings were made from 4 stock plants which were stunted at flowering time. 3 of these stunted plants produced no normal cuttings and 13 stunted ones. One stunted plant produced 2 normal and 2 stunted plants. Vesper is seriously dwarfed by stunt and is easily separated from the normal plants.

Sunnyside showed little stunt excepting under certain indexing units. It does not show stunt as much as some other varieties but sometimes is seriously dwarfed. Those treatments which could be used showed 41 normal and 8 stunted plants. All 41 plants were propagated.

23 normal plants produced 142 normal cuttings and no stunt.
3 normal plants produced 20 stunted cuttings and no normals.
15 normal plants produced 83 normal and 33 stunted cuttings.

Two of the stunted plants were propagated. One gave 8 normal cuttings and one gave 5 normal and 7 stunted cuttings.

Valencia is not as seriously affected by stunt as some other varieties. It is easily indexed at flowering time; especially by a marginal light treatment. 51 normal plants and 35 stunted ones were in the original planting. 48 of the normal plants were propagated.

6 normal plants produced 33 normal cuttings and no stunted ones.
20 normal plants produced 136 stunted cuttings and no normal ones.
22 normal plants produced 73 normal and 66 stunted plants.
5 stunted plants produced 39 stunted cuttings and no normal ones.

Arcadia is seriously dwarfed with stunt, and easily indexed. The original stock con-

sisted of 44 stunted plants and 53 normal ones. Cuttings were made from the 53 normal plants and from 9 stunted ones.

17 normal plants produced 120 normal cuttings and no stunted ones.

13 normal plants produced 64 stunted plants and no normal ones.

23 normal plants produced 115 normal cuttings and 66 stunted ones.

1 stunted plant gave 1 normal and no stunted cuttings.

6 stunted plants gave 27 stunted cuttings and no normal ones.

2 stunted plants gave 8 normal and

6 stunted cuttings.

STOCK PLANTS INCREASE IN STUNT PRODUCTION

In July 1947, 161 rooted cuttings of Vibrant were benched. These were given supplementary light and grown at 60 degrees minimum to be used as stock plants for experimental work. It was obvious that about half the plants were producing stunted cuttings. Cuttings were made from each stock plant in February. Cuttings from each plant were placed together and the plants indexed for stunt. 73 of the original stock plants produced only stunted cuttings and 88 of the plants produced only normal cuttings. 9 of the stock plants produced some stunted and some normal cuttings.

All plants which produced stunted cuttings were removed from the stock bench. On June 26 cuttings were made from each of 42 of the healthy plants. They were grown to near flowering and the amount of stunt determined.

Vibrant is easily indexed in the young stages of growth. It is the most severely injured of any variety tried. At a minimum temperature of 60 degrees the stunted plants are chlorotic while at higher temperatures they remain green but grow slowly.

11 normal plants produced 64 normal and no stunted cuttings.

10 normal plants produced 25 stunted cuttings and no normal ones.

21 normal plants produced 48 normal and 122 stunted cuttings.

These same stock plants remained in the bench from June until September when they were again indexed.

3 plants produced 12 normal cuttings and no stunt.

33 plants produced 256 stunted cuttings and no normal ones.

6 plants produced 20 normal and 30 stunted cuttings.

SUMMARY

In all of these experiments, insect control was average for a commercial grower. Aphids were present in the growing tips some of the time. Plants were pinched with the fingers and cuttings were removed from the stock plants with a knife. No special precautions were taken to prevent spread of stunt

other than the average grower is in the habit of using. Plants were not allowed to grow at temperatures lower than 60 degrees.

Of all the varieties used excepting Vibrant only one lot of cuttings was taken from each stock plant. The evidence from the data on Vibrant shows the stock continued to produce a higher total percentage of stunted cuttings from February to September when only 12 normal cuttings were obtained from 318 taken. Either spread occurred or the stock plants were infected earlier and time and high temperature enabled the stunt causing organism to develop rapidly.

In these experiments, 245 apparently normal stock plants and 20 stunted stock plants were saved for propagating purposes. A total of 1512 cuttings were flowered from the apparently normal plants. 907 of the cuttings produced normal plants and 605 produced stunted plants or 40 percent of the resulting plants were stunted in the first lot of cuttings from the stock.

Of the total 245 normal stock plants 102 produced 556 normal cuttings and no stunted ones. 57 plants produced 293 stunted cuttings and no normal ones. 87 plants produced 541 normal cuttings and 312 stunted ones.

The 20 stunted stock plants produced 24 normal cuttings and 103 stunted ones. Either the stock plants were dwarfed because of some other reason than stunt and they were thought to be stunted, or stunted plants did produce normal cuttings under the conditions they were grown. Of the 20 stunted stock plants 2 produced 9 normal cuttings and no stunted ones, 14 produced 79 stunted and no normal ones, and 4 produced 15 normal cuttings and 15 stunted ones.

A more accurate method of detecting stunt is obviously necessary to be certain the stunted appearing plants are infected with stunt. Many stock plants gave both normal and stunted cuttings which shows part of the plant was infected and the other portion was not affected or the infection occurred immediately before, during or soon after the cuttings were made. We have seen examples of stock plants which appeared half stunted and half normal.

It appears from these data that growers having some infected stock in their greenhouses are very likely to have a higher percentage of stunt next year even though they carefully select plants in the flowering stage and use regularly established propagation practices. It is obvious that selection of plants in the flowering stage is not the proper method of eliminating stunt from a variety.

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Your editor,

Kenneth Post