

## Chrysanthemum Stunt

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Within the past two seasons a new malady of chrysanthemums known as "stunt" has been observed causing serious damage in greenhouse and clothhouse plantings throughout the country. The trouble was first observed here in 1945 when considerable irregularity was noticed in certain varieties, though at the time it was discounted as being due merely to differences in vigor of the cuttings. In 1946 it became obvious, both here and elsewhere, that the trouble was actually increasing and could no longer be dismissed as being due to normal variation in vigor. This season the increase in prevalence of the disease has been so great as to cause considerable alarm. Many cases have been noted in which 30 to 60 per cent of the plants were so seriously affected as to be almost worthless.

### Symptoms of "stunt"

As with all other diseases, symptoms of stunt vary with the variety, but the following have been more or less consistent: (a) the young foliage may be paler than normal and has a tendency to more upright growth rather than growing at a wide angle with the stem; (b) diseased plants show stunting in growth after they have been in the soil a few weeks, and at maturity they may in some cases be less than half as tall as normal; (c) buds may form and blossoms open a week or 10 days ahead of those on healthy plants; (d) with varieties possessing red pigment (the bronzes, pinks and reds) the red component of the color is badly bleached; (e) with some varieties the blossoms may be greatly reduced in size.

It should be pointed out that some of these symptoms, e.g., stunting, bleaching, and dwarfing of flowers, are also characteristic of *Verticillium* wilt on a number of varieties. However, *Verticillium* also causes a characteristic marginal wilting and burning of the lower foliage whereas stunt alone does not. Furthermore, *Verticillium* has not been observed to have any effect in hastening bloom development. There may be many cases, nonetheless, in which these two diseases will be confused and in which laboratory diagnosis will be needed.

### Cause of the Trouble

While the cause of stunt has not yet been definitely determined Dr. Philip Brierley and Dr. Floyd F. Smith, of the United States Department of Agriculture at Beltsville, Maryland, have fairly good evidence that it is a virus. They, and others, have shown definitely that it is transmitted with cuttings taken from diseased parent stock. In addition, spread has occurred from diseased varieties to others not previously affected, indicating that it has been transmitted by an insect. Just what insect is involved is not yet known.



Figure 1. Stunt effect on blossoms of Dark Pink Orchid Queen. Note reduction in size and loss of color in diseased blossom (upper) as compared with the healthy (lower).

### Control Measures

Until the cause and means of spread of stunt have been definitely determined it will not be possible to formulate thoroughly satisfactory control measures. For the time being, we must base suggestions on the knowledge that the disease may be carried with the cuttings, and on the belief that it is a virus trouble which may be spread by insects. Accordingly, we suggest: (1) that the best possible insect control be maintained at all times; (2) that all diseased plants be rogued out so that they will not be saved for propagation; (3) that stock plants for propagation be retained throughout the year in greenhouses which can be maintained almost completely free of insects by screening and proper use of insecticides. Treatment of stock plants with sodium selenate at the maximum safe dosage should by all means be employed for insect control in addition to sprays and fumigants, so that aphids will have no opportunity to build up. We recognize that these measures will not give complete control, certainly not in a single season, but they are the only measures available at the present time and should at least greatly reduce the amount of disease which might otherwise be carried over.