



Colorado State Flower Growers Association

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IT'S A NEW BABY!!



With the appearance of this bulletin, the Colorado State Flower Growers Association passes another milestone. It is to be used to keep the members of C. S. F. G. A. posted on what is going on at Colorado A. and M. and what is new at other experiment stations and in the trade as a whole. Advance notice of coming events and meetings and news of Denver will be contributed regularly by Ralph Hill, Jr. The journalistic talents of individual members will be used freely. It's a baby now, but watch it grow.

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WHAT WE CAN DO TO CONTROL WILT DISEASES OF CARNATIONS
By Wm. E. Gunesch, Park-Elitch Company
(Talk presented at Colorado Short Course, Sept. 16, 1949.)

In order to approach the topic, "What We Can Do To Control Wilt Diseases," I believe we should first review, briefly, the history of carnations diseases in the Denver area and then bury some of our preconceived opinions of why plants die.

I cannot tell you what the loss of carnation plants amounted to in the '20's or even the early '30's. My review of the disease problem begins in 1936 when I first began contacting the growers in this area. We had a disease problem then and we still have one today. You know and I know that there was a serious disease problem in this area in the early '30's. Professor Starkey at Colorado A & M College was working with you growers. He was advocating the removal of old diseased soil and washing the benches with a 1-1000 solution of Mercuric chloride. At that time practically all growers changed soil every year. Soil sterilization was not being practiced.

Soil sterilization did not become a general practice until some time after 1939. Growers referred to their problem as stem rot, and root rot. It was generally believed that all the difficulty arose from the use of that particular soil. Then Professor Starkey showed that the disease organisms could be carried over on the bench boards and reinfest the new virgin soil placed in that bench. He also showed that the practice of liming or white washing the bench had no fungicidal effect.

There was then the period when we were all talking about Spectrum disease. The name was acquired primarily because the Spectrum varieties, which were grown profusely at that time, were heavily infected. But this occurred during the period when we were sterilizing benches. Now we sterilize the planting soil, the sides and bottoms of the benches, and the propagating sand, or use sterile vermiculite, and we still experience heavy loss of plants.

To say, there has been no progress in improved growing practices in the past 15 or 20 years would be a grave injustice. You are now using root promoting substances, the cuttings are dipped before and after sticking in fungicidal materials, temperature of the propagating media has been raised for quicker rooting, and then there is constant level or injection watering. This is progress, and I come back to the same statement - Still we have disease.

Why do growers, who are experiencing loss of carnation plants, constantly keep coming up with statements such as these: "What we need to do is return to our old method of growing"; or, "We never had this disease problem when we were feeding bone meal, and tankage, and blood"; or, "We rooted carnations before root stimulating materials were known, and almost as fast too, and we can do it again." I have heard such statements discussed at great length. Why, you ask? I believe I can answer that question. Because growers the world over are human beings. It is easier to think in the past than it is to think in the future. It is easier to remember what you did in the old days rather than analyze the problem from the standpoint of the new developments that have been made in the past 15 or 20 years and appraise them honestly. Then again, what crops do you remember in the past? Generally, we remember only the good things that happened to us in the "good old days." The poor crops were not pleasant memories so we shun them from our minds. The good crops, the excellent crops, are the ones that are remembered because they feed our ego. They give us the opportunity to brag and boast a little about what we have done.

And so we arrive at the point of attacking our present problem. Not with opinionated ideas of how this disease problem occurred, not with statements and action that take us backward 15 or 20 years, but let us tackle this problem with a well thought out program, taking into consideration all of the new advancements that you have put into practice the last few years.

First - let's be honest with ourselves. If you have lost plants - admit it. Check back over the procedure used in producing that crop and find out where you slipped.

Second - Make a careful survey of each bench, listing the bench by number and the variety and designate those benches that have not lost a plant as O. K. This means walking each aisle twice. Scrutinize each bench from each side. Those benches that have no plants missing and have not been plugged or had plants replanted into them get an O.K. They are a starting point for cutting stock. They may not be 100% clean but they have gone through the summer heat and disease symptoms if present should be showing. Pay particular attention to carry over benches. They have grown through 2 summers and if no plants are missing you can feel relatively sure they are clean. They could be cut back now for propagating material or later after a crop of flowers has been removed.

Third - Remove the diseased plants from those benches which you could not O.K. as free from disease. Remove the plants carefully, being sure not to scatter any more soil than necessary. Place the diseased plants in a bucket so that all parts of plant and soil are carried out of the greenhouse and are not scattered in the walk.

Apply the tests as outlined by Dr. Thomas to determine what disease you have. The symptoms are briefly but precisely described. Use the outline Thomas and Holley have prepared as a key, taking each symptom in the order listed and checking as to whether or not it applies. You should be able to determine quite accurately what disease is affecting that particular plant. If in doubt have the plants plated.

Fourth - Take the first cuttings from the O.K.'d benches and take these cuttings at the growing bench. Do not remove cuttings from cut stems at the grading table. This is a job for the propagator or grower, not the graders. Do not remove cuttings from cut stems from plants that show disease symptoms on one side and throw these cuttings in the walk.

Fifth - Do not trim the base or the tops of any cuttings. It is not necessary to remove even the thin hair of plant tissue that often remains on heel cuttings. Cuttings root better if not trimmed.

Sixth - Sterilize the bench boards and the propagating media. If you use sand the entire job may be done at one time, by steam. If you use vermiculite be sure the bench boards have been steamed or treated with some disinfectant. The recommended disinfecting agents are mercuric chloride (bichloride of mercury) - 1:1000 solution, or formaldehyde - 1 gal 40% solution (formalin) to 25 gals. water.*

Sterilize all tools, the marking knife, packing board, leveling stick, and shovels, hoes, or rakes that might be used in the propagating bench.

Seventh - It is not necessary to treat cuttings with root stimulating materials by the soaking method. Basal end of cuttings may be dusted with root promoting substances or may be sprayed with an atomizer.

Eighth - It is not necessary to dip cuttings in Fermate or Zerlate. Take clean appearing cuttings.

Ninth - Give cuttings more space in the propagating bench. Rows 3" apart and 1" apart in the row.

Tenth - Partition propagating bench so carriers may not be close to other varieties. There is some indication that some varieties such as the Fisher varieties, may be carriers of Bacterial wilt and yet not show symptoms. Doubtful varieties may be propagated in flats.

Eleventh - Plant the cuttings in sterilized soil. Sterilize 2 or 3 months in advance of time when soil is to be used. Build outside benches, sterilize in the fall. Compute amount of soil you will need. Before it is used it should be aerated several times. Be sure tools used, rototiller, shovel, hoe, rake, etc. are sterilized by steam or are dipped in formaldehyde.

Those of you who are skeptical of using steam sterilized soil for cuttings may use Chloropicrin (tear gas) Larvicide. This material has been shown to give

*Formaldehyde fumes are injurious to growing plants. Ventilate freely while using formaldehyde as a sterilizing agent.

excellent control of soil borne fungi and bacteria. Treatment can be made in the ball but it must be done when you can still maintain a 65°F soil temperature. Let me caution you about doing this job too close to the greenhouse. If the wind is blowing toward the greenhouse when the treated soil is airing out you are apt to get some injury to plants inside the greenhouse. A distance of 50' from the greenhouse is not too great for insured safety.

Twelfth - Do a thorough job of roguing when the cuttings are planted and later. There is an advantage to planting cuttings in plant bands. More individual roguing.

Thirteenth - Watch water source. If you have a reservoir where water leaching through diseased benches finds its way back to the reservoir and is reused you may be in for additional grief. This is an excellent way of nullifying all the care you went to in sterilizing your propagating bench. Sterilize water lines with steam or some disinfectant, also the watering hose. Place a new hose at the propagation bench.

Fourteenth - Establishment of mother blocks for propagating stock is practically essential in order to obtain complete clean up of wilt diseases. Early propagation of selected vigorous, disease free cuttings should give approximately 50 cuttings per square foot of bench area.

For the grower who produces carnations and chrysanthemums it is possible to propagate carnation cuttings in December and plant direct from the propagating bench in January to those benches which produced chrysanthemums through late November or early December. This permits about 3 to 4 weeks to get your benches ready for the carnation cuttings. These carnation cuttings planted direct will furnish 4 to 6 cuttings by March for planting standard in June and there will still be sufficient shoots left to give a light crop of cut flowers in late July or early August.

The better arrangement is to place the mother block stock in an isolated range. It is impractical to establish mother block stock in a range or house that has diseased plants growing in it.

The ideal situation in my estimation is to have a separate isolated greenhouse for the production of cuttings from mother block stock and to grow on your new young plants in this same house.

Fifteenth - High calcium for reducing or holding bacterial wilt in check. This recommendation is the result of experimental work at Ohio State University. They recommend 200 ppm. of calcium with a pH value of 6.0 to 6.5.

Sixteenth - Isolate all new varieties for at least 1 year.

Seventeenth - Be sure all benches growing young stock as well as those that are cutting flowers are level. This is a small matter but nevertheless when you are looking for benches from which to take clean disease free cuttings you hate to have a grower tell you, "That bench is O.K., it does not dry out evenly and those plants are dying because they were overwatered." Do not permit yourself to think in those terms just because the rest of the bench looks good and only a few plants are missing at one spot. You cannot afford to make excuses and alibies for your plants and yourself. Level your benches before you plant.

Important. Let's think through our program thoroughly. Be honest, the Golden Rule applies, do not sell cuttings that you are in doubt about. Don't sell anything that you wouldn't buy.