Carmen Cosentino Presents

Cornell Floriculture Seminar

Carm Cosentino of Cosentino Florist, Auburn, recently presented the weekly Dept. of Floriculture and Ornamental Horticulture Seminar speaking on “The Future of the Floriculture Industry in New York State.” The audience included undergraduate and graduate students, and faculty and staff of the Department of Floriculture and Ornamental Horticulture at Cornell. Carmen’s enthusiastic and lively presentation indicated the floriculture industry is growing and that there are many opportunities in all phases of the field. It seemed during the question period that every student wanted to know (1) what is the future for a young person with a Bachelor of Science degree in floriculture in the industry?, (2) why do students hear that there are many jobs until they look for them?, and (3) why doesn’t the industry offer starting wages to a recent college graduate which are more comparable to other industries? Carmen fielded the questions well, indicating that industry is maturing and that salaries and opportunities are improving every day.

R. W. Langhans

Unemployment Insurance Service O.K.ed

The Board of Directors at their April 24 meeting decided that there was interest enough to go ahead with the Unemployment Insurance Service and gave it their final approval.

We are surprised, however, that we haven’t received more Authorization forms as yet. Remember — 1. You could save money. 2. You get a valuable service. 3. The only cost to you is 15 of any savings.

DON'T PUT IT OFF — MAIL YOUR AUTHORIZATION TODAY!

All Roads Lead to

Lake George Sept. 13 - 16

The Convention Committee and the Board of Directors of N.Y.S. Flower Industries met separately, but on the same day, April 24, at Voorhesville. Both voted an all clear — full speed ahead for this year’s Fall Flower Festival, September 13-16 at Bolton Landing.

Program committees reported that very interesting workshops and seminars are being planned, but details were not quite complete as we go to press. Just to whet your appetite — how about a panel — (a grower, a wholesaler, a retailer), with a topic like “Who’s to Blame?—Not Me.”

The Design School committee has lined up Lou Shea, Clover Flower Shop, Camden, New Jersey, as commentator; and four designers, sponsored by the wire services, will provide a spectacular design school on Sunday afternoon.

Of equal interest, perhaps, will be the Saturday afternoon Design seminar covering special topics such as use of “Dried Materials,” “Terrariums,” and “Christmas Materials.”

Mark your calendar now! Plan a weekend vacation in September at Lake George.

“The Sagamore” 1974 Convention Site
Fusarium Stub Dieback of Carnation

Paul E. Nelson, Barbara W. Pennypacker, T. A. Toussoun and R. K. Horst
Departments of Plant Pathology
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Fusarium stem rot is caused by the fungus, *Fusarium roseum*, and is a distinct disease from Fusarium wilt caused by *F. oxysporum* f. sp. *dianthi*. *Fusarium oxysporum* f. sp. *dianthi* enters the plant through the root tips and grows throughout the water-conducting tissue of the plant while *F. roseum* usually attacks the outer portion of the stem. In the past, *F. roseum* has been considered mainly to cause a basal cutting rot and a stem rot on young plants causing the most damage to cuttings during propagation and to young rooted cuttings when they are benched.

In the past few years, carnation growers in the northeastern USA have experienced moderate to severe losses from the Fusarium stem rot disease. However, these losses were not from stem rot on young rooted cuttings, but resulted from damage on mature flowering plants. A program was initiated to study this disease in 1970. The study was supported in part by a grant from the Pennsylvania Flower Growers (Dillon Research Fund) and the field work was done in cooperation with Mr. Herman Hellberg of the Peter Hellberg Company, Chalfont, Pa.

Damage occurs on mature flowering plants as a dieback of the stubs left when flowers are cut or plants are pinched (Fig. 1, 2). The fungus grows down the stub killing it (Fig. 2a, 3a), and then into the sidebreak (Fig. 2b, 3c) or main stem (Fig 2c, 3b) and may girdle the stem causing wilting and death of the branches and reducing the productivity of the plant (Fig. 3). When the relative humidity in the greenhouse is high for a period of time, the fungus can be seen growing on infected stubs (Fig. 5, 6). Often a stem is girdled by the fungus about the time a flower is ready to be cut resulting in the loss of that flower just prior to harvest (Fig. 4). These symptoms are called the stub dieback phase of Fusarium stem rot of carnation and are caused by the fungus, *F. roseum* 'Graminearum'.

Stub dieback has occurred more frequently in the past few years resulting in serious losses for some growers. Losses result from girdling and killing stems of the current flower crop and from stem girdling of sidebreaks that would produce a future flower crop. Losses from Fusarium stub dieback in Pennsylvania for 1973 averaged 12% based on grower estimates. In 1972, the Pennsylvania carnation crop had a wholesale value of 3 million dollars and on this basis the estimated value of the crop loss due to this disease was about $360,000 for 1973. In New York, stub dieback also has been the most damaging disease on carnation in recent years.

Carnation stub dieback is not a new disease although the epidemic that occurred in the northeastern USA from 1969 to 1973 was a most destructive outbreak of the disease. The disease was first reported in California in 1912. Since then it has been reported to occur in England, France, Denmark, Sweden, and New Zealand. It has been called by branch rot, die-back, stub fusariosis, and stub dieback. We think the latter term best describes the disease and will use it throughout this paper. In England the disease was considered to be of minor importance because growth of the fungus rarely progressed down the stem more than a few internodes and stopped at the junction with a larger branch or main stem. In the USA, France, and New Zealand, the disease was considered to be a potentially serious problem. *Fusarium roseum* 'Avenaceum', *F. roseum* 'Culmorum' and several other *Fusarium* species have been reported to cause this disease. Both *F. Roseum* 'Avenaceum' and *F. roseum* 'Culmorum' are pathogens on carnation in the USA and are important as the cause of basal cutting rot and stem rot of young rooted cuttings. However, we have only found *F. roseum* 'Graminearum' associated with stub dieback and have not been able to isolate either *F. roseum* 'Avenaceum' or *F. roseum* 'Culmorum' from affected plants. Apparently this is the first time *F. roseum* 'Graminearum' has been reported as the cause of this disease and may be in part responsible for the severity of the disease outbreak in this area. During the past few years, we have observed cases where *F. roseum* 'Graminearum' attacked a stub several feet from the ground, grew down that stub into the main stem, and eventually all the way to the soil line killing the entire plant.

Although infected stubs can occur on young plants at the time they are pinched, most infected stubs occur on second year plants and are 3½ to 4 feet or more above the soil line. This is too far for spores to be spread by splashing water and indicates that spores may be spread through the air. A program of air sampling was initiated to determine what spores might be present in the air in a carnation greenhouse. Petri dishes containing a special agar medium, devised for direct isolation of *Fusarium* species were used. Dishes were exposed, for 15 minute periods in two greenhouses, at biweekly or monthly intervals during a six month period. After exposure, the plates were returned to the laboratory and placed in a favorable environment for growth of *Fusarium* species. All isolates were identified after a suitable growth period.

Samples were taken at 14 foot intervals along each bench at each sampling period. Three dishes were used at each sampling site and one dish was placed directly on the soil, one 21 inches above the soil and one 49 inches above the soil. The two lower dishes at each sampling site were in the foliage canopy while the upper dish was above the foliage canopy in the area of the flowers and flower buds.

Concurrently with the air sampling, stubs showing dieback symptoms were collected and cultured. All *Fusarium* species recovered were identified. Samples of wood fibers from the cooling pads were collected in September and October and cultured and all *Fusarium* species recovered were identified. Petri dishes of the special agar medium were also used to sample air outside the greenhouses and to obtain samples from the air around piles of carnation trash near the greenhouse.

The largest number of isolates of *F. roseum* 'Graminearum', obtained from air sampling in the greenhouse, occurred on dishes exposed in September. Isolates occurred on dishes exposed 49 inches above the soil, indicating the possibility of air-borne fungus spores.

The fungus was also recovered from carnation stubs showing severe dieback symptoms, and from wood fibers from the cooling pads. The fungus was not recovered from air sampling outside the greenhouses or air around the trash piles. All isolates of *F. roseum* 'Graminearum' (continued on page 5)
SPEAKING OF DELIVERY PROBLEMS . . .

The following letter appeared in The Greater Kansas City Florist Association's "Petal Points" Newsletter:

"Sir: The purpose of this letter is to inform you of the difficulties of transporting flowers in Alaska, which is nothing new down here. We have not had difficulty getting space on the airlines, but our little ferry broke down, which brings the flowers from the airport, which is on another island. In order to get my poinsettias across the channel, I had them flown over by helicopter. This information is for those who think they have delivery problems!" Ketchikan Flower & Gift Shop, Margaret Vandiver, Ketchikan, Alaska.

Dieback of Carnations

(continued from page 2)

were tested for pathogenicity on unrooted carnation cuttings and on freshly cut stubs left when flowers were cut. Unrooted cuttings were soaked in a suspension of conidia for 1 hour and rooted under intermittent mist in a mixture of ½ peat and ½ perlite for 30 days. After 30 days, the cuttings were removed and rated for basal stem rot. Freshly cut stubs were inoculated with a drop of water containing approximately 50 conidia. The drop was placed on the cut surface and the stub bagged to keep the relative humidity high. Isolates from air, stubs, and cooling pad fibers were pathogenic on both unrooted cuttings and freshly cut stubs. A large number of stubs collected and cultured did not yield any *Fusarium* species. Apparently there is some dieback or death of tissue on a stub that occurs naturally at certain times of the year. Many of the stubs collected showed dieback only ¼ to ½ inch back from the cut surface (Fig. 3) and *F. roseum* 'Graminearum' usually was not isolated from these stubs. At the time of the stub collections, some stubs of this type were collected along with those showing more extensive dieback. Later in the year, stubs showing limited dieback could be distinguished easily from those infected by *F. roseum* 'Graminearum' because there was limited tissue death of uninfected stubs while in infected stubs the tissue was killed back to the main stem and girdling of the main stem and side shoots may occur.

The reasons for the sudden outbreak of the stub dieback phase of this disease are not known. However, there are several factors that may have some effect on disease development. Nutrition programs for carnations have been improved and are more closely regulated resulting in plants with a high nitrogen content and lush, soft growth. High nitrogen and rapid soft growth both make the plant more susceptible to *F. roseum* ‘Graminearum’ and favor development of the disease. The widespread use of fan and pad cooling results in higher relative humidity during the time the system is in operation and high relative humidity also favors disease development. The use of carbon dioxide in the fall, winter, and spring to improve flower quality also adds moisture to the greenhouse atmosphere and thus may raise the relative humidity. It is possible that these, and other factors, are in part responsible for the disease outbreaks over the past few years.

Future articles will deal with the source of the fungus, environmental conditions favoring disease development and disease control.
Treflan Causes A Small-Leaf Condition In Greenhouse Roses

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When a grower finds abnormal plant growth, he wants to know the cause both to correct the situation and prevent reoccurrence. In October 1972, a rose grower observed that many of the young shoots of cultivars 'Forever Yours' and 'Faberge' had zones with very small leaves (Fig. 1 & 2). Below and above these zones, the leaf size and flowers were normal, indicating that some factor had arrested growth at certain stages in the development of the rose shoot.

The problem appeared about the time the ventilators were first closed during the evening and heat was being used. Although the small leaf condition was similar to that which Paul V. Nelson (1) found to be caused by copper deficiency, this was believed unlikely because of the subsequent appearance of normal leaves farther up the stem. The widespread occurrence of the problem in the greenhouse at the start of the heating season when the ventilators were closed suggested a temporary influence such as spray or fumigation injury or air pollution.

After considering various possibilities, we became suspicious of the herbicide Treflan (trifluralin) which had been applied to the soil surface according to instructions for the control of weeds. It was suspected that either some of the material had accidentally fallen on the heating pipes and volatilized or sufficient fumes came from the soil surface to affect the young leaves in the closed greenhouse. Although the production of fumes sufficient to produce the leaf crippling seemed unlikely, the possible volatility of Treflan was tested by direct fumigation and by soil application.

The fumigation effect was tested by exposing potted 'Red American Beauty' rose plants to fumes of Treflan. Treflan at several rates was vaporized slowly in a small room. The plants with young shoots were put in the closed room for a 2-hour exposure, and grown under normal greenhouse conditions. After about a week, the plants showed symptoms (Fig. 3) very similar to the abnormal growth at certain stages in the development of the rose shoot.

Following exposure to rates of 2, 4 or 8 lb ai/A for 3-day periods, 'Red American Beauty' and 'Forever Yours' plants developed the typical small leaf symptoms shown in Figure 3. In only 1 treatment did the 1 lb rate produce a very slight effect.

To determine the length of exposure necessary for Treflan to cause the effect on the leaves, a series of tests was run at 0 and 1 lb ai/A on the soil: pots were removed after 1, 2 and 3 days. The 1-day (24-hr) exposure at the 1 lb rate was sufficient to produce the damage.

From these experiments, it is evident that Treflan can vaporize from the soil in a greenhouse and produce a small-leaf symptom on 'Red American Beauty' and 'Forever Yours' roses. In a closed greenhouse, a rate of 1 lb ai/A Treflan applied to the soil can be hazardous and Treflan on the pipes would make the situation still worse. Although these tests were only with roses, Treflan probably should not be used in any greenhouses because fumes are confined. The material, however, is satisfactory for soil application for roses out of doors.

1 Professor of Floriculture at Ithaca.
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Figure 1. Malformed leaves on 'Forever Yours'.
To simplify information, trade names of products have been used. No endorsement of named products is intended, nor is criticism implied of similar products not mentioned. Mention of a chemical does not imply guarantee of effectiveness or safety, nor that the chemicals or uses discussed have been registered by appropriate state and federal agencies.

**Figure 2.** Malformed leaves on ‘Faberge’.

**Figure 3.** Malformed leaves of ‘Red American Beauty’ on shoots of various lengths when exposed to vaporization of Treflan. Flowers were normal; their condition in the photo is due to age when photographed.

**FACTS DISPEL HOSPITAL FLOWER CONTROVERSY**

Dr. Richard Dixon, chief of the hospital infections section of the U. S. Public Health Service’s Communicable Disease Center in Atlanta, also points out, “You can find gram-negative and gram-positive bacteria almost anywhere you look in a hospital, especially in aqueous (wet) environments. The problem is to decide which reservoirs are really the significant ones.

“We’ve heard of concern about flowers, telephones and sink drains for a long time, but our epidemiologic investigations usually don’t produce much evidence that these reservoirs are important in a patient’s acquisition of infection.”

You might want to use these two quotes to ease your customers’ fears about the distorted news stories. Being well informed will help you answer their questions on the subject.

It’s important that your customers know it has been an accepted practice for almost 30 years not to permit flowers in the rooms of certain high-risk patients. This category would include after neuro-surgery, kidney dialysis, burn wounds and intensive care.

However, high-risk patients represent only a small minority of the total hospital population. It has been proven time and again that the majority of patients benefit from gifts of flowers and plants as a means of boosting their spirits and morale.

—FTD

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—Paul Ecke Poinsettias

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