

STEMPHYLLIUM CALYX ROT OF CARNATIONS

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A calyx rot of carnation flowers was found in plastic and glass greenhouse ranges in several different areas of California. High atmospheric moisture conditions were prevalent in the growing areas. Daytime temperatures were high (80° to 90°F.) in one case and somewhat lower (60° to 70°F.) in another.

The rot involved only the calyxes and did not extend into the petals or other floral tissues. The fungus [Pleospora herbarum (Stemphyllium botryosum imperfect state)]

apparently invaded the dead cells that form at the tips of the calyxes and progressed down, killing additional cells as it advanced. The killed tissue was brownish red with occasional purpling. The rot sometimes extended to the base of the calyx. The infected tissue remained firm. The fungus sporulated on the older infected areas near the tip. Both conidia and perithecia were formed on infected tissues.

Calyx rot is a new disease in that it has not previously been des-

cribed. We believe the disease occurred as a result of the use of the fungicide benomyl. Several parts per million methyl benzimidazole carbamate were detected by bioassay of infected calyxes using Penicillium expansum as the assay fungus.

It may be that benomyl is controlling Botrytis cinerea, which, under high moisture conditions, would ordinarily rot the petals and destroy the flower so that the Stemphyllium calyx rot would go unnoticed. Or perhaps the presence of the methyl benzimidazole carbamate (from breakdown of benomyl) predisposes the calyx tissue to Stemphyllium attack. Another possible mechanism of benomyl action is the effect on microorganisms that would normally invade the few dead cells at the calyxes and prevent Stemphyllium invasion. Other mechanisms could also be proposed.

The disease has not caused major losses and probably will not become an important problem especially since the use of benzimidazole fungicides like benomyl may be curtailed because of Botrytis cinerea resistance.

We have not reproduced the disease by inoculation with the fungus. However, this work is under way.

Carnation growers who have losses from the disease should include a fungicide that controls a related disease, Alternaria branch rot. Dithiocarbamates such as zineb, maneb, mancozeb, and ferbam are suggested. Captan and chlorothalonil would probably also be effective.

Pad and fan cooling systems should be used with caution. If water is run through the pads late in the day or if fans are allowed to operate late on sunny days when outside air is cool, conditions become ideal for disease development within the greenhouse. Last summer, one grower encountered this type of problem. Through judicious use of benomyl, Botrytis was controlled but Stemphyllium developed unchecked.

When growers find Stemphyllium or Botrytis, they should modify their ventilation practices. Depending on circumstances, this might include 1) discontinuing water flow in the pads an hour before the fans turn off; 2) installing a plastic drop curtain between the pads and the greenhouse to prevent interchange of cold, moist, night air; or 3) if pads are not used, purge moist warm air from the greenhouse before sunset by cracking ridge vents or by running exhaust fans.