

# Unwanted Guests: A Review of Plant Disorders in 2005

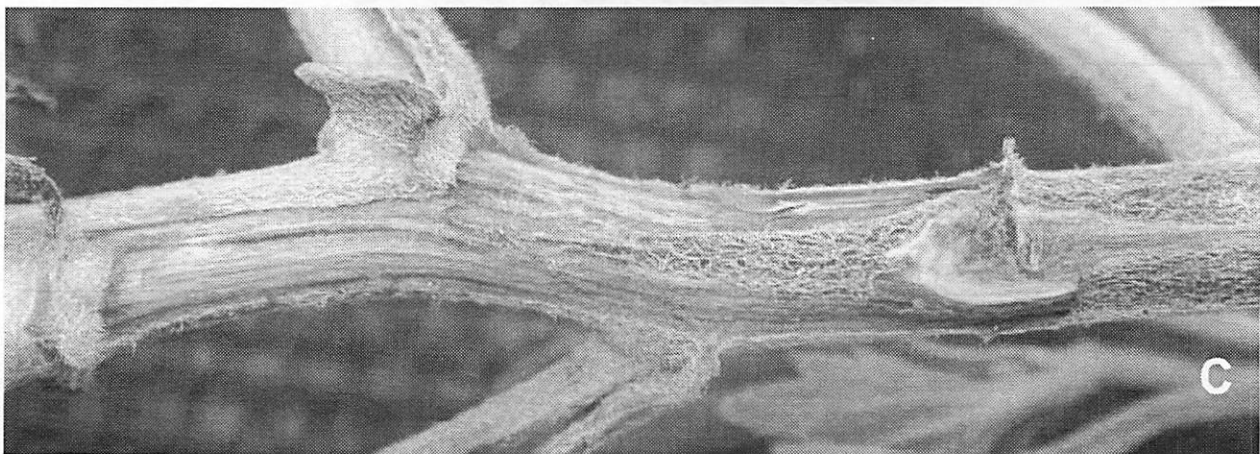
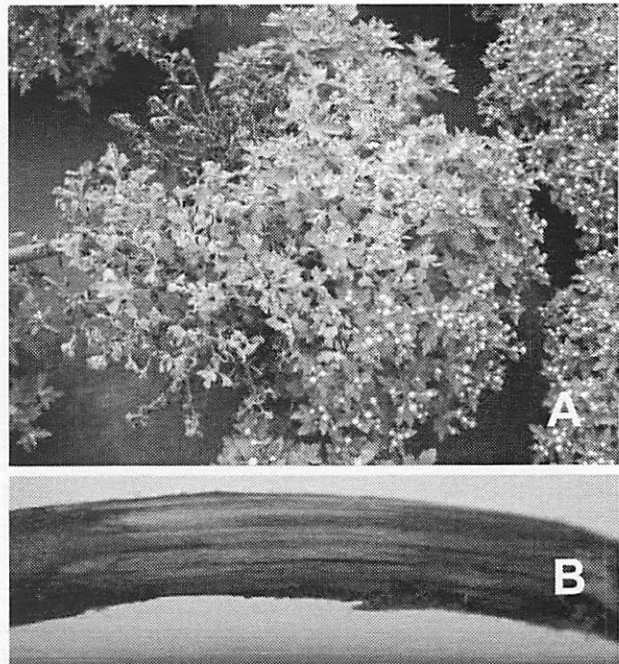
**Brian Whipker and Colleen Warfield, NC State University**

Diseases, insects, physiological, and nutritional disorders love plants almost as much as we do. The following article highlights some of the problems which occurred around North Carolina this year. We wanted to make you aware of what was going on and

help you identify the problem if encountered. While on-site diagnostics may work for some of the problems, you may still want to submit a sample to the NCSU Plant Disease and Insect Clinic to have it confirmed.

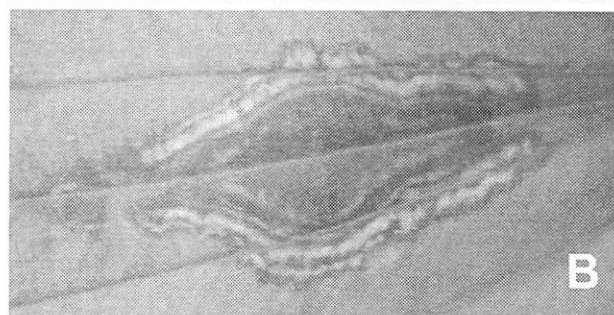
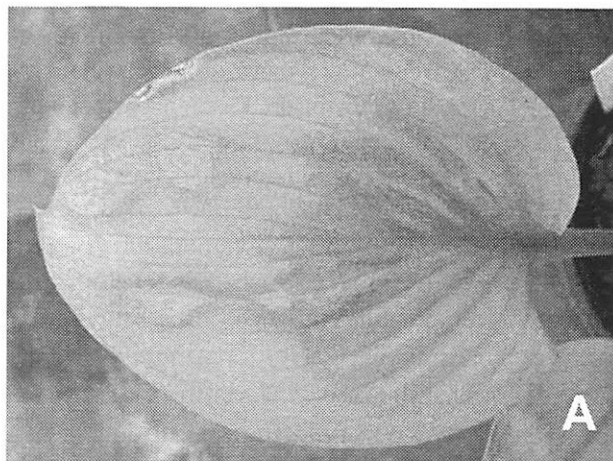
## *Fusarium*

This fall a number of garden mums were submitted to the clinic with partial wilting of the plant canopy (A). The root system usually appears to be good. By removing the outer bark of the stem, a discoloration of the vascular tissue can be seen (B and C). This is an excellent method to determine the presence of *Fusarium* wilt. The disease is favored by warm temperatures and can be spread by splashing water. Fungicide applications of Heritage, Banrot, Medallion, Mycostop, Cleary's 3336, OHP-6672, or Terraguard will help in early season prevention.

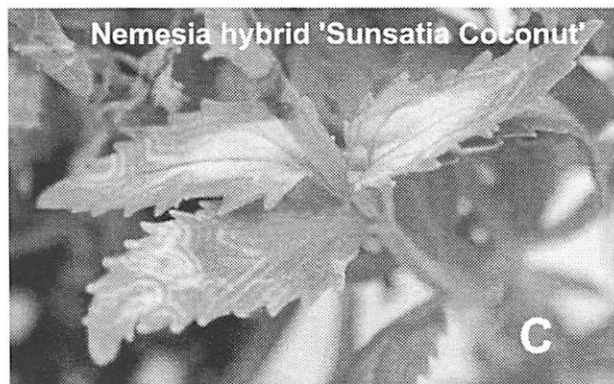
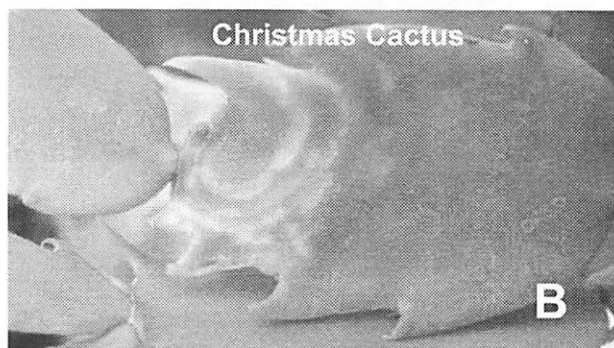
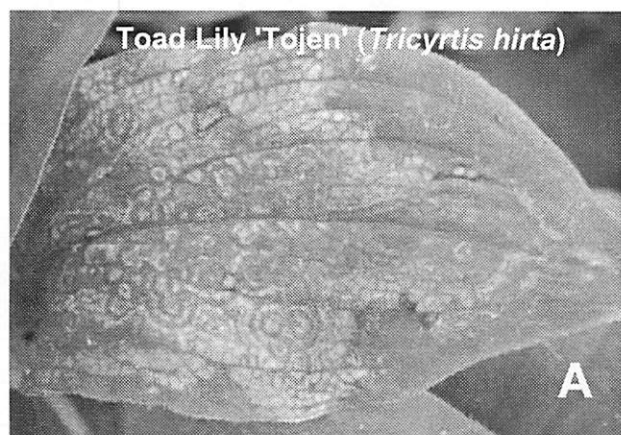


### *Hosta Virus X*

Typical symptoms of a hosta virus is a mottled leaf growth or a mottled ringspot (A and B). A number of viruses can infect hostas, including Impatiens necrotic spot virus (INSV), Tomato Ringspot Virus (ToRSV), Tobacco Rattle Virus (TRV), Arabis Mosaic Virus (ArMV), and Hosta Virus X (HVX). It is impossible to identify a particular virus by symptoms alone, therefore submitting a plant for virus testing is the only way to confirm it. HVX is becoming a more widespread problem with hostas. It can be transmitted during propagation or mechanically (hands, tools, etc.) by the plant sap. No chemical controls are available. Rogue infected plants.



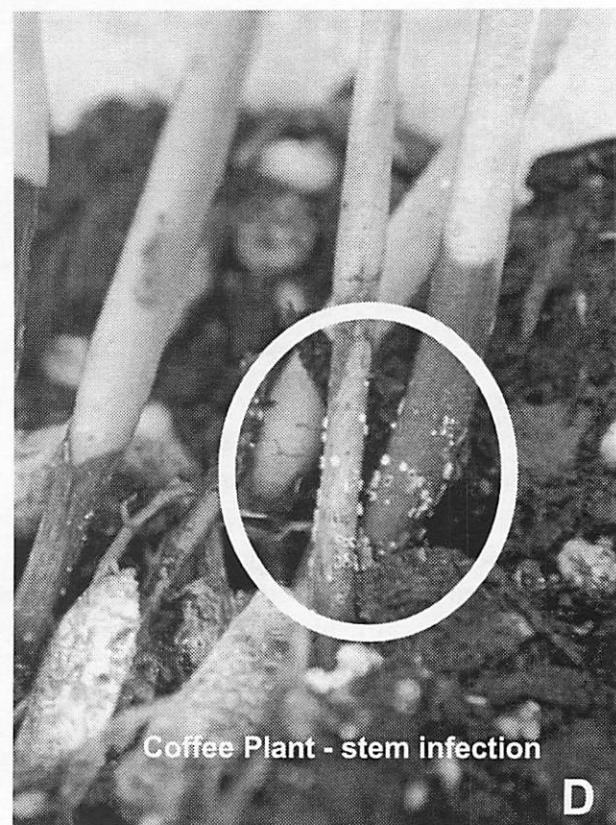
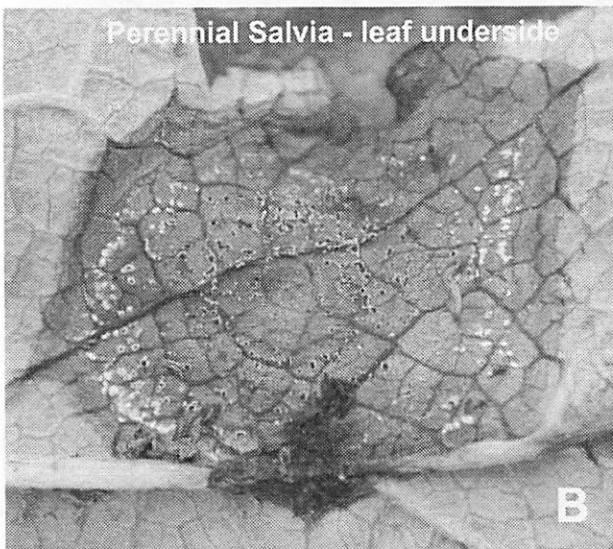
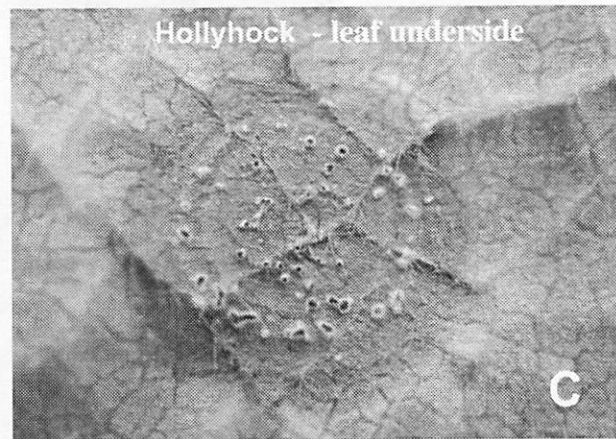
### *INSV and TSWV*



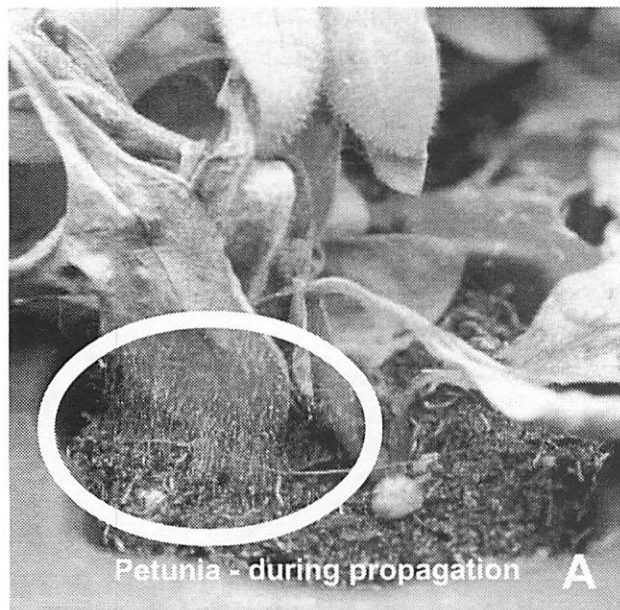
Impatiens Necrotic Spot Virus (INSV) and Tomato Spotted Wilt Virus (TSWV) were confirmed on a number of vegetatively propagated plants in 2005, including coleus, nemesia, and verbena. It can be spread by thrips or by mechanical means. Ringspotting is the most common symptom (A, B, and C). Testing will confirm the disease. No chemical controls are available for "curing" the disease, but controlling thrips will help limit its spread. Rogue infected plants.

## Myrothecium

The incidence of myrothecium is still low in North Carolina, but the frequency is increasing. This disease can infect leaf or stem (D) tissue. Circular or irregular leaf spots with concentric zonation are observed on the upper leaf surface (A). A diagnostic characteristic is the presence of a circular pattern of small, black sporodochia rimmed with white hyphal tufts on the lower leaf surface (B and C). Disease development is favored by temperatures of 70 to 80F, high humidity, and wet conditions. Fungicide applications of Heritage, Daconil Ultrex, Medallion, Compass O, or Terraguard will help in prevention.



## Rhizoctonia



Petunia - during propagation **A**



Gerbera - web-like growth **B**



Nemesia - bag test **C**

This disease starts at the soil line or just below. The stem becomes soft and mushy, and the plant wilts. Plant may appear stunted and have yellow leaves that may later become water-soaked. Roots are sometimes affected, but rot is primarily found at the crown. Web-like strands of the fungus on the soil surface may be visible with a hand lens (A and B).

Placing the plant overnight in a sealed plastic bag (C) with a moist paper towel (D) will help promote the web-like fungal growth for diagnosis. The bag test works best if the soil is moist to help increase the humidity. Fungal growth should be visible within 24 hours. Symptoms may be slow to develop, if at all, if fungicide applications were recently applied.

Once a rooting strip or a cell pack is infected, the fungus can move through the entire strip infecting other plants. Plants are often infected, but symptoms may not be visible. Discard infected plants. Fungicide applications of Heritage, Spectro, Banrot, Medallion, Contrast, Prostar, Chipco 26GT, Sextant, Terrachlor, Cleary's 3336, FungoFlo, OHP-6672, Compass, or Terraguard will help in prevention.

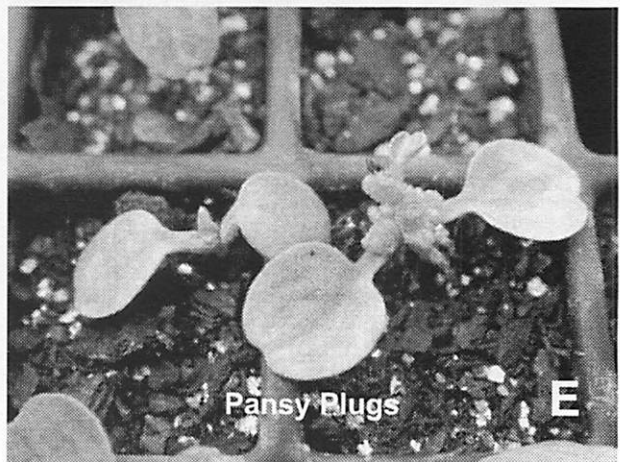
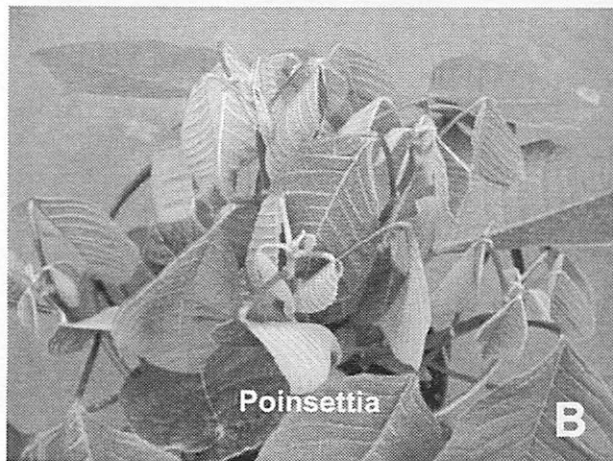


Gerbera - web-like growth **D**

## Herbicide Drift

Herbicide drift from the neighbor's fields has been a serious problem with two greenhouse operations this fall. Vapors can easily enter the greenhouse through the ventilation system and only a minute amount of vapor is necessary to cause plant damage. Vapors can easily travel up to a mile away from the application site and still cause severe damage. Damaged plants should be observed for a few weeks to see if the new

growth reverts back to normal growth. The plants in the photos were most likely injured from an "auxin" type herbicide to cause the distorted growth (A and B). (Roundup causes chlorosis of the new tissue.) The degree of injury was more severe just after pinching (C and D) or on rapidly developing pansy plugs (E).

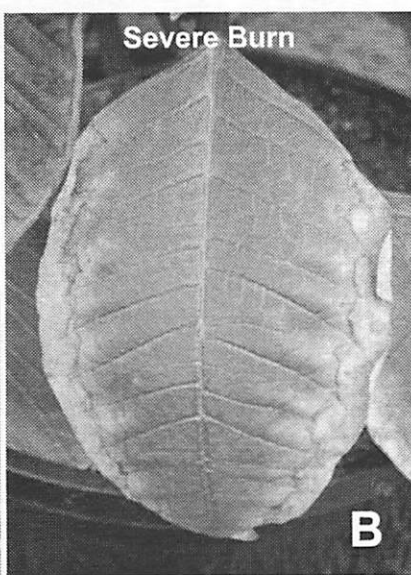
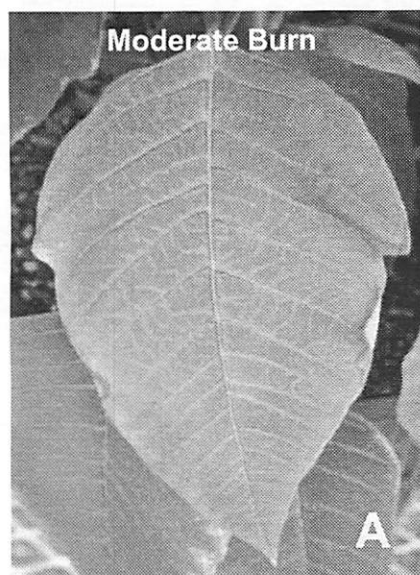


## Dodder

This photo was emailed from a North Carolina grower after a customer's plants were covered with an orange, thread-like growth (A). The problem is dodder, a parasitic annual vine which lacks leaves or chlorophyll. Dodder is spread by seed and survives if only an appropriate host is present. In landscape beds, the dodder plants should be removed before they reseed.



## Fertilizer Burn (High EC)

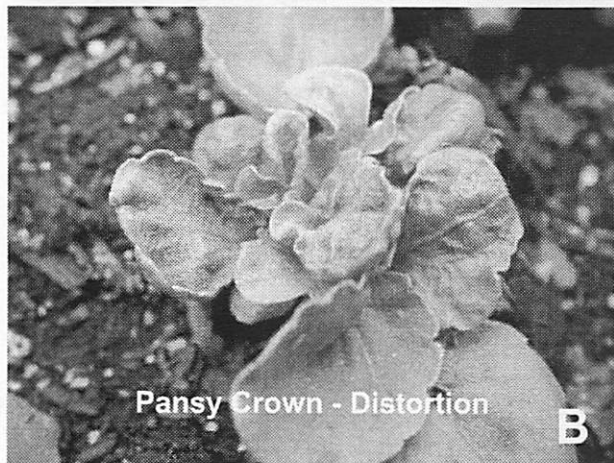


Two cases of leaf burn occurred this fall. The marginal leaf burn is a common symptom of high EC. With the poinsettias, the slow release fertilizer incorporated into the substrate released prematurely due to the hot temperatures (A and B). The garden mum had an accumulation of fertilizer salts and was being grown on the dry side (C). Testing the substrate EC will help determine the cause of the problem, although it is difficult to predict spikes in EC levels due to "dumping" of slow release fertilizers. Irrigating with clear water will help lower EC levels.

## Distorted Growth

A number of growers had distorted growth of pansies this fall (A and B). It is thought to be a boron deficiency, although others attribute the problem to be a calcium deficiency. In either case, it is thought to be environmentally induced due to decreased transpiration rate of the plant. Both B and Ca are taken up with the water stream in conjunction with

transpiration. Waterlogged substrates, injured roots, or planting cuttings too deep can also be thought to induce the problem, as seen with the begonia (C) and garden mum (D). With boron deficiency, the leaves become thick and distorted, break when folded (F), and secondary shoots can develop (E).



## Pansy Leaf Mottling



Pansies with a mottled white and green leaf growth have been a major problem this year for a few growers (A and C). Severe symptoms include a die back of the growing tip (B), flower abortion (D and E), and distorted leaves. Plants may eventually grow out of the mottling if the symptoms are not too severe. The mottled growth distinguishes this problem from Boron (or Calcium) deficiencies. It is still unclear what is the exact cause. One current line of investigation is confirming a virus or phytoplasma infection.

