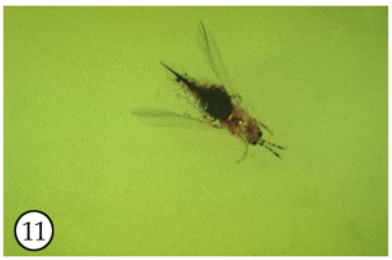


11. Thrips on yellow sticky card, S. Gill

VI. CASE STUDIES

12. Petunia indicator plant for thrips, M. Daughtrey

These case studies, drawn from actual experiences in New York greenhouses, show how pest management strategies are implemented and evaluated.

Case Study 1: Thrips and INSV on Impatiens

A grower who had experienced large losses for the past two years in his impatiens crop because of INSV decided to use indicator plants for early virus detection (table 6; photos 11-14).

Table 6. Thrips average in impatiens house

DATE	Trap Catch	AVG.	
Jan. 2	all 0	0	Petunias (indicator plant for INSV/ TSWV*) were placed December 26.
9	0, 2, 2, 4	2	
16	0, 0, 0, 2	0.5	No thrips controls have been used because populations are so low.
23	all 0	0	
30	all 0	0	
Feb. 6	all 0	0	
13	0, 0, 0, 4	1	
20	0, 0, 0, 4	1	
27	0, 1, 1, 0	0.5	On February 27, INSV symptoms appear on petunia indicator plants. QTA-Tospo™ kit confirms plant is infected.

*INSV=impatiens necrotic spot virus
TSWV=tomato spotted wilt virus

13. Petunia 'Calypso' with thrips feeding injury, M. Daughtrey

14. INSV symptoms on fava bean indicator plant, M. Daughtrey

Strategy Implemented on February 27

Even though thrips numbers were too low up to this point to warrant spraying, the presence of a virus means there are viruliferous thrips in the greenhouse (and therefore there is no tolerance for thrips).

- Remove indicator plant, taking it from the greenhouse in a sealed plastic bag. Replace it with non-infected indicator.
- Treat for thrips three times at 5-day intervals.
- Inspect at least twice as many plants as normal for INSV in this house for the next 3 to 4 weeks.
- Try to identify the reservoir of the virus.
- Do not move plants into or out of this house.

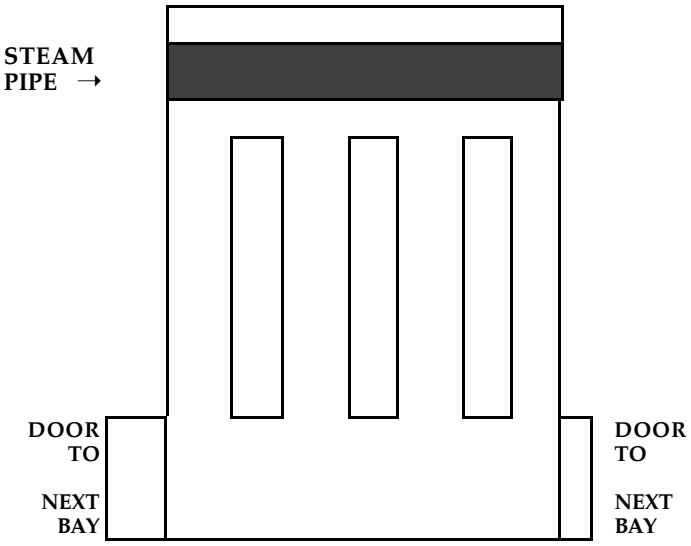
Results

- Use of indicator plants alerted the grower to the need to spray for thrips to control the spread of the virus. Only six plants out of 3,000 were lost to the virus.

Case Study 2: Whiteflies on Hidden Weeds

Shown in table 7 are the greenhouse map and yellow sticky card counts for the first eight weeks of a geranium crop grown in a gutter-connected greenhouse. An average of three whitefly-infested plants were observed each week in this 3,000 sq. ft. bay. The doors to the adjoining bays were kept closed, and pesticides were not applied until March 15. What was going on?

Table 7. Map of greenhouse and card counts



Whitefly Card Counts—House 3

Date	Card 1	Card 2	Card 3
7-Feb	0	0	4
14-Feb	0	0	5
21-Feb	0	0	7
28-Feb	0	0	15
7-Mar	0	1	18
14-Mar	0	1	20
21-Mar	3	5	5
28-Mar	0	0	0

On March 14, after he finished counting the cards, the scout looked behind the steam pipe near card 3 and saw a clump of about 20 weeds that were heavily infested with whiteflies. He pulled them and removed them from the greenhouse. He did not place them in a bag, so as he walked through the greenhouse, many of the insects were knocked off the weeds. Thus there were whitefly adults on all cards the following week. On March 15 the grower applied a wet spray to control

the adults, and no further card catches were recorded. (Remember, the insects counted on the 21st probably arrived there on the 14th, *after* the card was counted but before pesticides were applied.) This infestation might have been avoided if the scout had thoroughly inspected for weeds at the beginning of the season (photo 15).

Case Study 3: Importance of Early Intervention

This grower, as her poinsettia crop was finishing, brought 50 fuchsia cuttings into the greenhouse on December 12. The scout found the fuchsia cuttings to be infested with whiteflies. He also found weeds with whiteflies.

At this point, the cuttings should have been treated with a pesticide or discarded and replaced with clean plants, and the weeds should have been removed. Instead, nothing was done until December 19 to either the cuttings or the weeds (see table 8).

15. Whiteflies on greenhouse weed, J. Sanderson

Table 8. Whitefly counts and control measures used

Date	WF on YSC[1]	Whitefly Observations	Control Measures Used
12-5	18.5		
12-12	22.7	fuchsia cuttings and weeds infested with whitefly	
12-19	73.4	fuchsia cuttings infested with whitefly	12/19 Resmethrin
12-27	18.4		12/23 Resmethrin
1-2	11.6	many whitefly immatures seen on fuchsia	
1-9	-----		1/8 Marathon
1-16	8.0		
1-23	62.4		
1-30	95		
2-6	37		2/3 Plantfume 103
2-13	4		2/10 Plantfume 103
2-20	3.2		2/17 Plantfume 103
2-27	1.2		
3-5	4.2		
3-12	22		3-12 Threw out fuchsias

[1] WF = whiteflies; YSC = yellow sticky card

Results

The Resmethrin applications of December 19 and 23 caused some adult mortality, so the YSC count on December 27 was much lower than the previous week. The eggs laid by the high adult populations of December 12 and 19 were not affected by the Resmethrin. These are seen as immatures on plants on January 2, and as adults on the YSC on January 23. This scenario illustrates why pest management decisions should be based on *plant and YSC* observations. A small number of adults seen on cards January 2 and 16 did not mean the population was declining, only that immatures were the predominant life stage.

Marathon could not be applied earlier than January 8 because the cuttings did not have an adequate root system for uptake. It took four weeks for this application to noticeably reduce the adult whitefly population; a wet spray should have been used in the interim. The large number of adults still present in February, four weeks after the Marathon application, is due to the continued presence of weed hosts. Plantfume 103 did have an effect, although three applications were probably not necessary. The grower discarded the cuttings, on which many whiteflies could still be seen, on March 12. Whiteflies caught that day were moving up from the weeds on the floor.

If the grower had thrown out the infested cuttings and removed the weeds when they were first observed, several pesticide applications could have been avoided. Furthermore, the crop would not have to have been discarded because it was infested.

Case Study 4: Root Rot Management

A grower noted a few collapsing poinsettia cuttings during propagation and thought no more of it. Several weeks later, however, she began to lose dozens of transplants. The roots were soft and discolored, and brown cankers showed at the base of some stems (photo 16).

Determining the Source of the Problem

The grower took the following steps:

- Sent a sample to the diagnostic lab. Results showed that *Pythium aphanidermatum* was causing the transplant losses.
- Checked soluble salts in the media using a saturated media extract. Results indicated that salts were at EC 5.7 (excessively high).
- Examined sticky card counts, which showed that fungus gnat populations had quadrupled since the last count (1 month earlier).

16. Pythium root rot on poinsettia, J. Lamboy

Addressing the Problem

Then the grower

- discarded plants with symptoms;
- irrigated poinsettias with only water for one week to reduce salt levels before resuming the regular fertilization program, thus making the root system less susceptible to *Pythium* attack. She tested the soil and, two weeks later, performed a foliar analysis to check the status of the micronutrients.
- treated the crop with a fungicide drench to protect against *Pythium;*
- drenched onto the surface of the growing medium a material effective against fungus gnat larvae. The reason? So adult fungus gnats would not be moving about the greenhouse spreading *Pythium.*
- permanently reconfigured the propagation area to eliminate puddling around the base of rooting strips. (Puddling would facilitate the spread of a fungus with swimming spores such as *Pythium aphanidermatum*).
- decided to make fungus gnat card counts on a weekly basis during poinsettia propagation, beginning two weeks before receiving cuttings;
- resolved to inspect the root health of the poinsettia crop regularly, sending in samples for diagnosis when appropriate.