

2000 REPORT ON THRIPS BIOLOGICAL CONTROL DEMONSTRATION IN ORANGE AND ULSTER COUNTIES

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ABSTRACT:

Since 1992, the educational focus of the Orange/Ulster IPM program has addressed current issues in greenhouse production while facilitating a bi-directional flow of information between growers and Cornell staff. The relationships that have developed have allowed us to identify cooperators for the demonstration of biological controls.

The predatory mite *Neoseiulus cucumeris* has been successfully used to control thrips for three consecutive seasons in the retail portion of a greenhouse range participating in the scouting program. Demonstrations over the past four years with *N. cucumeris* in Orange County have provided educational opportunities for growers, extension staff and researchers. In 1999, we expanded the thrips predator demonstration from one retail greenhouse to three production greenhouse operations, in Ulster and Orange Counties. We worked closely with growers and cooperators to share our past experience as well as to gain information on biological control systems using *N. cucumeris* in commercial greenhouse settings. In 2000 we compared two application methods, sprinkle vs. sachet, and also investigated the use of *Hypoaspis miles* in combination with *N. cucumeris*. Preliminary results suggest that the sprinkle method provided better thrips control than the sachet method, and the addition of *Hypoaspis* provided improved control of thrips at one greenhouse operation.

BACKGROUND:

1996- 1998 Year 1 - *N. cucumeris* release using sachet method refined in retail setting.

1999- Predator demonstration expanded to production settings in three greenhouse operations.

* For more detail, please refer to 1998 and 1999 IPM progress reports for Orange County.

OBJECTIVES, PROCEDURES, RESULTS, AND DISCUSSION

1) Fine tune *N. cucumeris* thrips control demonstration in three production greenhouses in Orange and Ulster Counties.

N. cucumeris was introduced to approximately 2500 ft² production space at each of three greenhouse businesses in Orange and Ulster counties that participated in demonstrations in 1999. Predators were released as soon as plants were in each greenhouse (early - mid February) and continued through April. The Orange County IPM coordinator collected data and scouted greenhouses for thrips and other pests weekly. Thrips levels were recorded using counts of adults on sticky cards, as well as counts of larvae and adults on foliage.

In 1999, the random method used to conduct foliar counts did not provide useful information regarding thrips levels. The IPM coordinator consulted with Cornell faculty and NYSIPM staff to develop a method that suited the needs of our demonstration and regular scoutings. In 2000, we included both random plant "tap counts" (10 plants per 1000 sq. ft), as well as "taps" on plants in known hot spots, such as on favored crops (dracena, ivy geraniums) or locations (near vents or doors), etc. For the purposes of this demonstration, the random tap method did not provide useful information at any thrips population levels.

2) Compare efficacy of *N. cucumeris* using two available application methods: slow-release sachets vs. sprinkling a "granular" product over the crop canopy, at the rates recommended by the supplier. Compare time (and cost of labor) to apply the predator using these two methods.

At one business where the predator provided excellent thrips control in the retail portion of their operation for three years, it proved somewhat less effective in their production house when introduced in 1999. One possible reason for this may have been the physical setup of the production area. Plants are widely spaced, and square benches are set in U-shaped patterns up either side of the main aisle. Using the slow-release sachet packets, the predatory mites may not move as easily from plant to plant throughout the crop.

Two houses with similar crop mixes were set up. In one house, the predators were released using 1 slow-release sachet every 25 sq.ft. as plant material moved into the greenhouse. A total of 103 sachets were released for the crop cycle. In the second house, predators were released by sprinkling a commercially available product over the crop canopy at a rate of 17-25 predators per sq. ft every two weeks (or 50,000 *N. cucumeris* per 2,500 sq ft. house every two weeks). The time to release the predator using each method was recorded and compared.

In the sachet house, thrips populations stayed low for several weeks, but increased rapidly near the end of March to more than 8 per card. One application of Conserve was applied. In the sprinkle house, thrips levels never rose above 0.3 per card, and no sprays were required. (see figure 1.)

The cost of the two application methods are compared as follows:

| Sachet House: | | Sprinkle House: | |
|--------------------------------|-----------------|--------------------------------|-----------------|
| Cost of <i>N. cucumeris</i> : | \$ 61.80 | Cost of <i>N. cucumeris</i> : | \$ 72.50 |
| Labor to release (@\$20/hr) | \$ 35.00 | Labor to release (@\$20/hr) | \$ 30.00 |
| <u>Shipping: (2 shipments)</u> | <u>\$ 24.00</u> | <u>Shipping: (4 shipments)</u> | <u>\$ 48.00</u> |
| | \$120.80 | | \$150.50 |

One advantage of the sachet method is that the product can be held longer than it can in the sprinkle containers. This reduces the cost of shipping as indicated above, since product needed for the season can be purchased less frequently.

We found that applying the predator using the sprinkle method was simpler than using sachets, since it did not require care in placing bags, opening sachets, dating bags, attaching to pots or stakes, etc. Mite distribution would not be impacted when plants were moved out of or spaced within the greenhouse, as would be the case if using sachets. The sprinkle method also eliminated the need to clean up empty sachets and stakes prior to sale.

The overall cost of application using the sprinkle method (\$150.50) was higher than using the sachet method. However, one application of Conserve was made in the sachet house, at a cost of \$18.00 (material and labor), bringing the total cost of pest management in the sachet house to \$138.80. The difference in total costs is less than \$12 for the entire greenhouse, or 5 cents per square foot.

3) Demonstrate efficacy of using *N. cucumeris* in combination with the soil predator *Hypoaspis miles*. Compare thrips levels when using the two predators in 2000 with levels using *N. cucumeris* alone in 1999. Compare cost of using *N. cucumeris* alone vs. in combination with *H. miles*.

At one greenhouse in Orange and one greenhouse in Ulster, *N. cucumeris* was released using the sachet method, as was done in 1999. In addition, *H. miles* was released by sprinkling commercially available product on the soil surface of each pot at a rate of 1 liter / 1000 sq. ft (or 20,000 *H. miles*/ 1000 sq. ft.). Thrips levels (determined by adult counts on sticky cards) were recorded weekly at each operation. These were compared with thrips levels at the same operations in 1999, when *N. cucumeris* was used alone. "Background thrips pressure" for each year was compared by looking at overall thrips levels at several other Orange county greenhouses that participated in the scouting program but not in the biological control demonstrations. This gave us some (albeit limited) ability to allow for differences from year to year in overall abundance of thrips.

In Greenhouse A, one spot spray and one full house spray (cost of labor and materials was approximately \$27) were applied for control of thrips in 1999, when *N. cucumeris* was used alone. In 2000, populations stayed below one thrips per card and no sprays were applied.

In Greenhouse B, four spot sprays and one full house spray were applied for control of thrips in 1999, when *N. cucumeris* was used alone. In 2000, only one spot spray and one full house spray were applied for thrips control. However, Orthene was applied three times for aphid control, and is likely to have impacted thrips populations.

In both operations, thrips counts were lower in 2000 where *H. miles* was used in combination with *N. cucumeris*, than in 1999 when *N. cucumeris* was used alone. (see figures 2 & 3). In greenhouse A, thrips populations remained low enough that no sprays were required, which implies that the addition of *H. miles* offered some additional thrips suppression. In Greenhouse B, the Orthene applications for aphid control may have impacted *H. miles*, so we cannot draw any conclusions regarding the benefit of the second predator in this operation. Thrips levels at other greenhouses in the scouting program were also somewhat lower in 2000 than they were in 1999.

The additional cost of using *H. miles* is as follows:

| | |
|-----------------------------|---------|
| Product (<i>H. miles</i>) | \$74.50 |
| Shipping | 5.00 |
| Labor | 10.00 |
| TOTAL | \$89.50 |

(approximately 3.5 cents per square foot)

In greenhouse A, \$27 was spent on spray applications in 1999. Adding *H. miles* into the thrips management program therefore cost \$62.50 more than using *N. cucumeris* alone.

4) Educate local growers on the use of biological controls.

Ongoing results and updates were featured in extension publications such as [Greenhouse Crop Management News](#), [AgFocus](#), and [Northeast Greenhouse IPM Notes](#). Final results will be published in these newsletters.

Dr. John Sanderson presented our data as part of his lecture to an international audience at the 2000 Ohio Florist Association Short Course. GMPro magazine featured our project in an interview with Deborah Sweeton, who has been an ongoing cooperator in our thrips biological control demonstrations.

Project leaders and a cooperating grower will deliver formal presentations on the use of biological controls as part of the Bedding Plants Schools in both the Hudson Valley and in the Capital District in January 2001.

SUMMARY

While “hot spot” taps did indicate the presence of thrips at high populations (as indicated by sticky cards), they did not provide additional information as compared to sticky cards alone. The sprinkle method was more effective and more convenient to apply than the sachet method, though it was slightly more expensive. The addition of *Hypoaspis miles* did appear to provide greater thrips control at one operation. Orthene applications at the second operation may have impacted thrips and/or *Hypoaspis* populations.

We plan to continue our demonstrations in thrips biological control in 2001. As the combination of *Hypoaspis* with *N. cucumeris* showed promise in our 2000 demonstration, it would be valuable to repeat this at other locations in 2001. We plan to collaborate with Dr. John Sanderson in statewide, or possibly regional, demonstrations in thrips biological control and other pest management.

Greenhouse A 1999 vs 2000

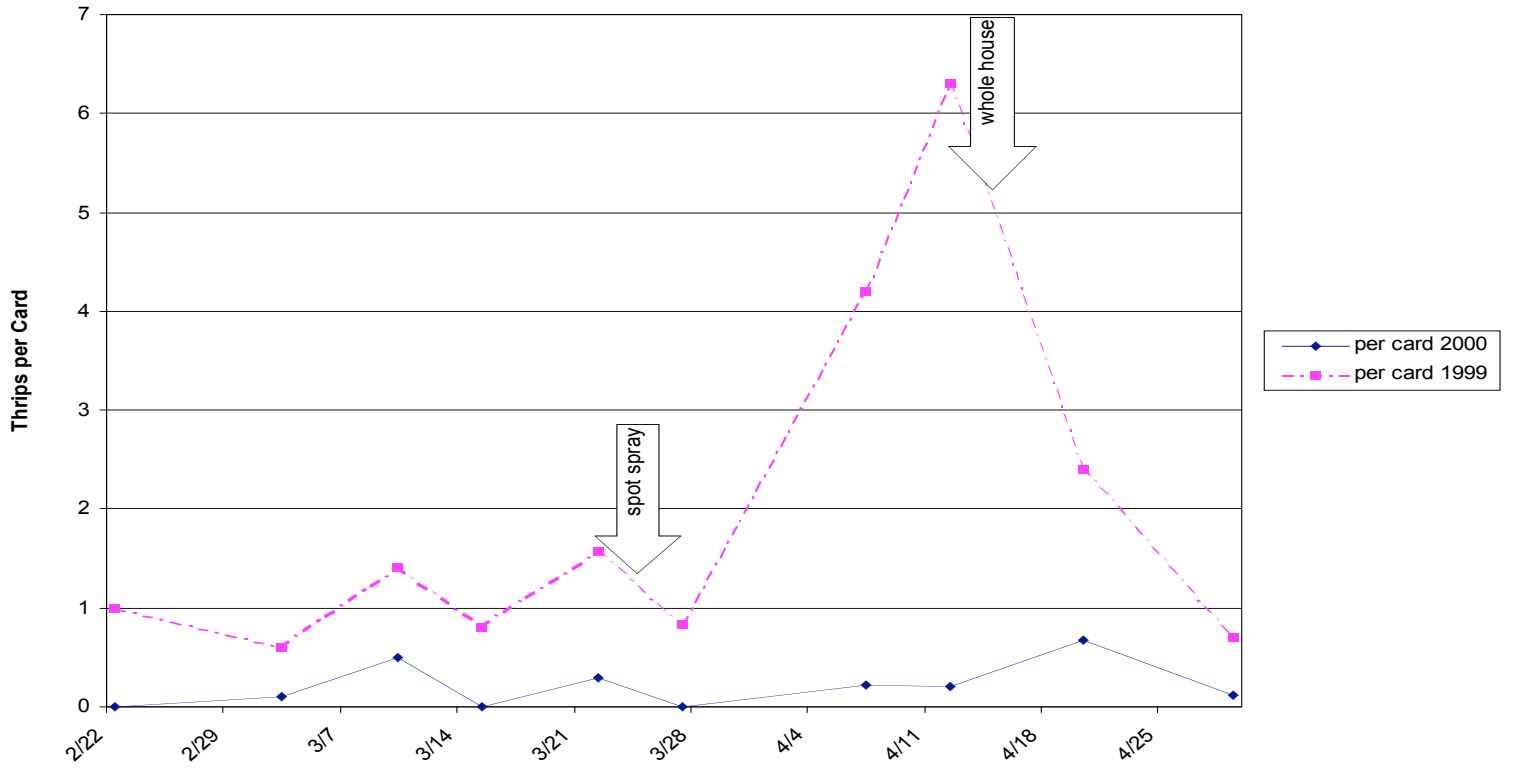


Figure 2

Greenhouse B 1999 vs 2000

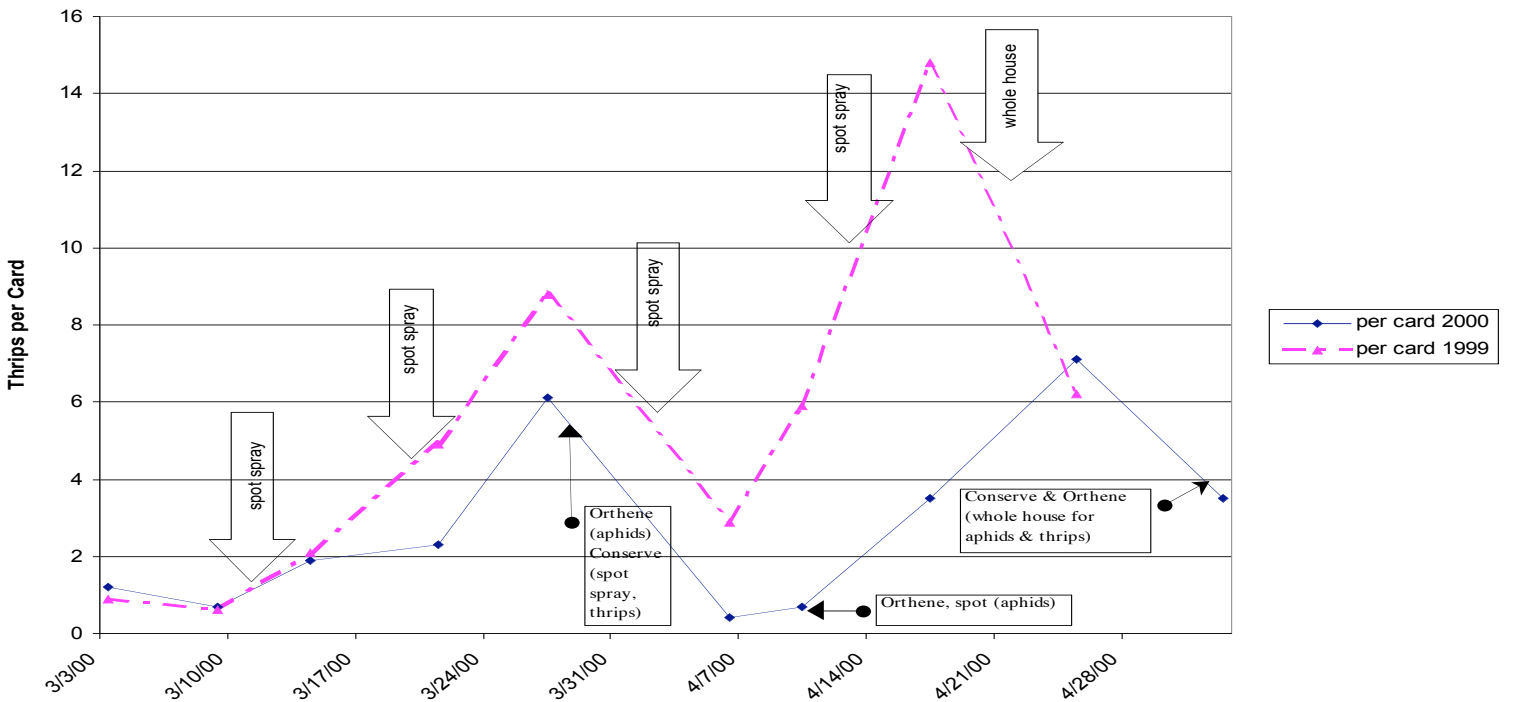


Figure 3

Sachet vs Sprinkle 2000

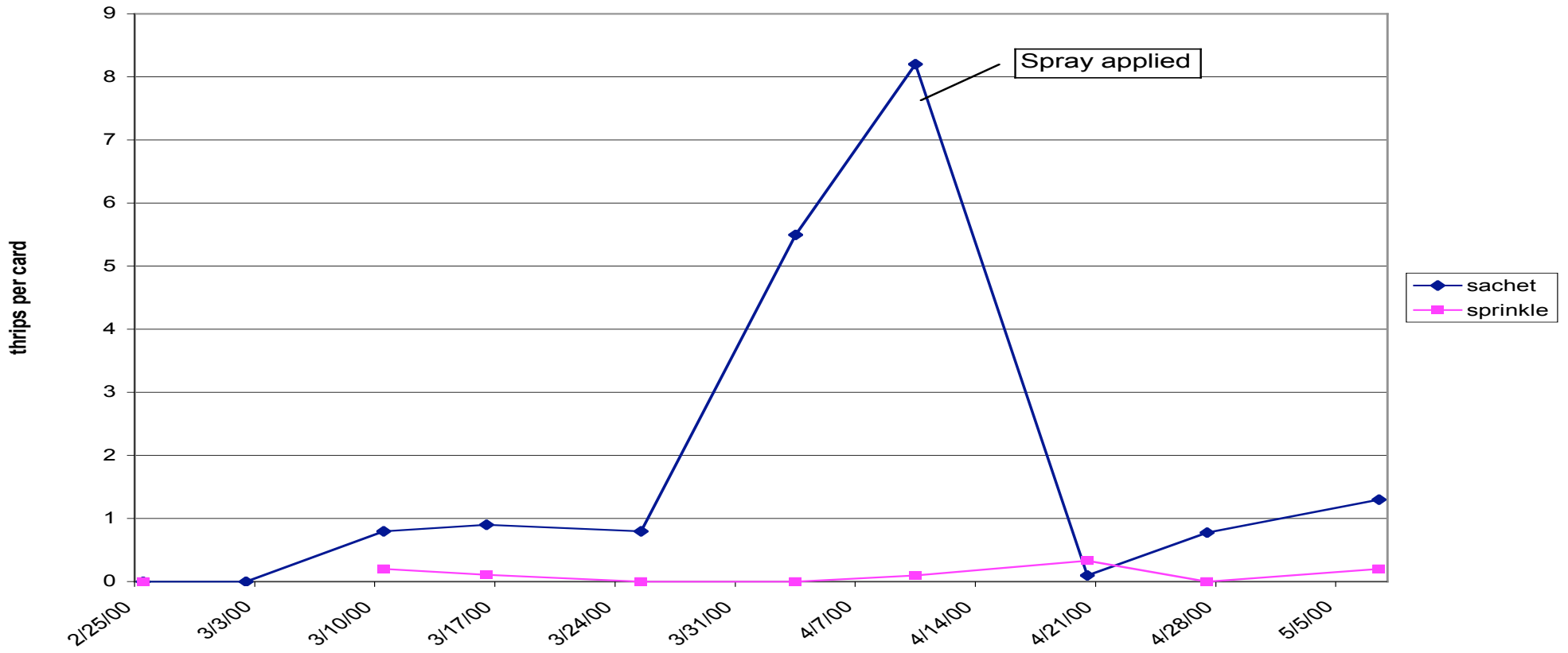


Figure 1