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Transplant Pest Management: Flowers vs. Vegetables; transplants vs. fruit

Introduction

The success of any transplant crop starts with a healthy greenhouse environment. This applies to flowering annuals such as impatiens; all the way to long season field vegetables such as brussel sprouts. There are many factors involved in producing a healthy transplant; light, water quality, fertility, growing medium and of course pest management. There are a number of cultural management tools for pest control, as well as chemical interventions. However it is challenging to understand which of these are effective (and legal) across the broad range of transplants grown in a typical northeast greenhouse.

Cultural Control

The first steps to managing pests in transplant production strives to prevent outbreaks. Sanitation, exclusion, plant resistance and proper plant density are all cultural controls.

Sanitation is critical and can be applied in many ways. The disinfection of surfaces such as benches, glazing and structural components can reduce overwintering populations of insects (and mites) as well as disease spores. There are a number of disinfectants available. Ammonium chloride materials such as Physan 20/20, GreenShield and Kleengrow are exclusively for sanitation of hard surfaces. Hydrogen Peroxide applications of ZeroTol (ornamentals) or Oxidate (edible crops) are also allowed for plants. This points us towards issues with pesticides we'll explore momentarily.

Exclusion of insects and diseases is challenging, but can be practiced by starting as many plants by seed as possible. Bought-in plant material often brings pests such as thrips and mites, as well as diseases such as Impatiens Necrotic Spot Virus.

For vegetable transplants there is a wide variety of resistance to some foliar diseases such as Powdery Mildew. Seek out summer squash and zucchini varieties listed as PM resistant. This will benefit commercial field growers as well retail customers. Note that the cucurbit powdery mildew is the same strain that affects the ornamental verbena. Growing these two crops together is risky for disease.

Finally among the many possible cultural controls we'll mention that proper plant density can help keep relative humidity levels low which will reduce disease incidence. Regular ventilation is also part of the strategy to keep humidity down.

Biological control

The use of predacious or parasitic insects and mites is a proven technique for managing pests, particularly in greenhouse vegetables grown for indoor harvest. For example, releasing the beneficial *Amblyseuis cucumeris* we were able to effectively control thrips in greenhouse cucumbers (see figure 1). However much of the success with beneficials is documented in crops such as tomatoes grown for harvest inside. The long life of the crop and relatively open canopy may be more conducive to biological

pest control than the dense foliage of ornamental baskets and flats. In addition, the relative quick turnaround of spring bedding plant operations may not give the beneficials time to work or justify the cost. There are ornamental growers who successfully use biocontrol, but the key point is to act preventatively.

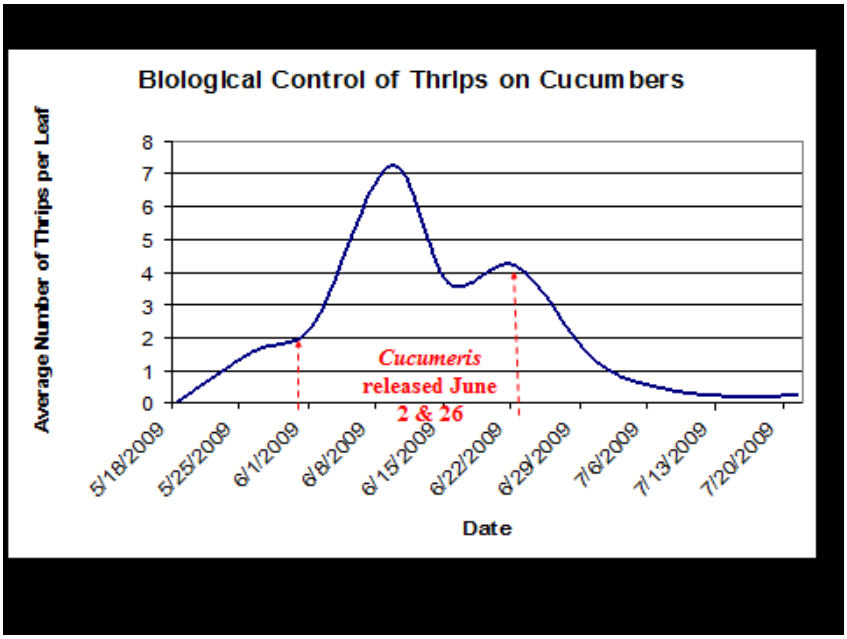

Figure 1. Effective control of thrips with beneficials in greenhouse cucumbers.

Pesticides

There are a number of materials that can be used as interventions after the above steps are in place and proving insufficient. As a general observation 'softer ' OMRI listed materials have labels that allow use on a broad range of crops and pests (in NYS both the pest and crop must be listed on the label for legal application). For example, Mycotrol, an OMRI listed spray, lists a long series of pests to be controlled in 'Vegetables and Ornamentals grown in Indoor/Outdoor Nursery, Greenhouse and Shadehouse." Many conventional chemistries are more specific. For example spirotetramat, an effective worm spray labeled as Radiant states emphatically "Do not apply Radiant SC in greenhouses". In other situations a chemical may have different labels for vegetables and ornamentals (see above case of Hydrogen Dioxide). In other cases a pesticide may be applied to vegetable transplants but not crops grown for harvest within a greenhouse. Cornell is developing a Guidelines to help grower navigate these situations, but there is no substitute for reading the pesticide label and ascertaining the legality for applications in greenhouse.

Conclusions

It may be noted that the more benign management tools; sanitation, ventilation, plant density, bio-control and softer chemistries are often applicable across ornamentals, vegetable transplants as well as vegetables for greenhouse harvest. There are a number of effective, and legal, chemistries that can be applied as well, but these will require greater diligence on the part of the applicator to interpret the pesticide label. Similar spray materials may be registered under different names for ornamentals and vegetables; while there are some greenhouse products that would not normally be used for field production. Given the opportunity for confusion, there is no substitution for studying the label. A combination of all the above management tools is recommended when possible.