

GROWERTALKS

Columns

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Achieving Our Biological Goals

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When I came to Pioneer Gardens, the concept of growing biologically was totally embraced and the way forward was planned with that style of production in mind. Growing clean crops without harsh chemicals is better for the employees, the environment and ultimately the end consumer. It takes a lot of organization, patience and discipline to get things right, but it's achievable if activities are performed in a timely manner. There seems to be a significant shift in the industry trending in this direction and more growers are seeing what can be achieved with biologicals. For some people, it may seem like a radical change and require a leap of faith to try this method, but believe me, it works.

In this article, I want to explain how it works for us and, as a result, how it allows us to concentrate on other quality-improving processes. I'll cover three main topics: propagation/initial planting, banker plants and ongoing PGR trials.

No plant can grow properly without a good root system and an initial overhead application of RootShield Plus creates the correct environment for this to develop. I'm a white root fanatic and believe that it's so important to give the plant good structure for its future development. Every plant that we produce, whether it's an unrooted cutting or a young plant for growing on is given an application of RootShield Plus before it enters the nursery environment. We purpose-built a special boom to accurately apply the recommended amount to each table.

I've said before that keeping the environment clean is very important, but every time we start a new crop with a new batch of mix, we inherit a new batch of fungus gnats. How we grow, wet/dry, warm/cold determines the damage these pests can do. Propagation, where temperature and humidity are high, is an ideal breeding ground and a potential disaster area for young rooting cuttings. Using the biological approach means that it's very important to know the life cycle of the insect that you're trying to control and, with that in mind, here's where my fungus gnat attack team comes into action.

Being biological doesn't mean that you have to completely rely on good insects to control unwanted pests. It's okay to incorporate soft chemicals, which are compatible with the biological control agents (BCAs) that you're using. My recipe is a timely combination of both of the above on a weekly basis.



In the propagation department, it's constant change on a daily basis, so continual vigilance is needed. Experience has taught me that BCAs alone aren't completely adequate for successful total control, so on Monday we sprench

Citation—a BCA-compatible insecticide—as the initial fungus gnat method of attack. Wednesday is the normal BCA arrival day (product ordered at least one week in advance of the planning process). Atheta and Hypoaspis are applied to every new table of product put into the prop since Monday. Some of these materials are stored correctly until week's end, then applied to any additional tables, so that all have been covered with fungus gnat and thrip-attacking insects. Also at the end of the week, another application of Citation is made to ensure that all tables of product have been covered.

Wednesday (in prop) and Friday (whole nursery) are also the days when we apply nematodes. These are sprayed routinely on a weekly basis and are an integral part of the successful rooting process.

We have a weekly scouting program (very important) in place, which involves monitoring yellow cards to establish how effective the program is. Every Monday cards are checked, insect counts recorded and new cards put out as needed. We also put out potato wedges in random cells to help monitor the fungus gnat population. Potato wedge inspection can show eaten tissue, but this can be due to Hypoaspis, which can easily be seen and not caused by damaging fungus gnat larvae. Figure 1 shows clean and damaged potato wedges.

With this procedure, we've achieved almost completely clean weekly cards, no fungus gnat larvae damage to tender new tissue and a strong white root system on the new crops. Figure 2 shows a sample of young newly rooted Ellepots.

The three main ingredients of this program are RootShield Plus, nematodes and Citation. In propagation, the BCAs are very important for the initial rooting process and are good to have in place later on in the growing process. It's also good to have Atheta and Hypoaspis in the Ellepots when our customers purchase young plants to start their finished crops.

A grower friend who has had serious problems with fungus gnats in the past tried the three-pronged approach with his spring crops this year and was extremely happy with the successful results. Figure 3 shows the hole made from a soil sample in a totally matted white root system of a fuchsia hanging basket crop. The white healthy root system also means more efficient fertilizer uptake and reduction in shrink due to root diseases. Crops can be grown using this method without the costly time-consuming application of harsh root fungi-controlling chemicals.

As we are a young plant growing facility with lots of ebb-and-flood tables, the placement of banker plants is difficult without a hanging system. One of the goals last year was to create such a system for this spring and as can be seen in Figure 4, this has been actioned. Purple Flash Peppers and lobularia with *Orius* introductions for thrips control are some of the plants used. Yellow marigolds—Hero and Bonanza varieties—and some zinnias are incorporated for good measure. These all started their life with the earlier mentioned “clean start” process. Figure 5 shows a resident *Orius* resting on a zinnia leaf between thrip meals.

Aphid banker plants are a vital part of the pest-control process. One of the things we’ve learned is to not cut corners when growing cereal banker plants. If this crop isn’t given the same initial pest protection, fungus gnat problems will come back to bite you in a big way. We’re still learning how to properly rear a regular banker plant supply in a cage or under protective netting. All the effort though is worth it when aphid mummies are found on crops all over the facility. It goes to show that by using the *Aphidius* family of parasitic wasps and no nasty pesticides in the production process, a desired level of biological aphid control can be achieved.

Limiting work environment disruption with lengthy REIs for pest control opens up opportunities for other activities. In a previous article, I mentioned that new PGR trials were being embarked on. So far, some of the results have been very exciting. Being able to increase the number of breaks on young cutting material can benefit our customers in a big way. Being able to finish fuller crops in a faster time can be more profitable for them. We’ve trialed a lot of varieties with Configure, with and without the addition of Florel. Mostly the results have been very positive and are leading to further experimentation.

As with most things, timing is important. Application rates of each chemical may vary—minor foliage damage may result—but so far, no serious disasters have happened and the positive increased breaking action being seen bodes well for further trials. One observation has been that the parent cutting may exhibit some nutritional deficiencies caused by the need for reserves to be relocated to the new developing breaks at the base of the cutting. Extra-heavy feeding corrects this problem and demonstrates that, in conjunction with a growth-stimulating PGR application, extra feeding is necessary. Figure 6 shows a sample of the increased breaks that can result from a Configure/Florel application. As alluded to before, Florel helps deflower a cutting, therefore, reducing the amount of pollen (food for thrips) in the facility.

If we keep our eyes open, study our crops and ensure that they remain clean, then our customers can be assured that we’re doing all we can to provide them with healthy, biologically grown product, which will fit right in with their new growing procedures. **GT**

Roger McGaughey, head grower at Pioneer Gardens in Deerfield, Massachusetts, was educated in Northern Ireland and England and has 40 years experience as a grower.