Fertilizer Injectors *Explained*

A guide to finding, using and maintaining the right fertilizer injector.

By Lela Kelly

When shopping for injectors, ask yourself about the instrument's cost, reliability, accuracy and maintenance requirements.

Fertilizing is one of the most important tasks in growing quality plant material, and yet, it is often the most overlooked. The right fertilizer in the right amount can make all the difference to your plants — and, ultimately, to your bottom line.

Fertilizing is just like any other aspect of your business: You want to get the job done quickly and accurately. One of the best ways to accomplish this is by using a fertilizer injector to automate the process, but with so many different injectors on the market, it can be difficult to determine which makes the most sense for your needs. By asking yourself the right questions and arming yourself with some basic knowledge about fertilizer use and maintenance, you'll have all the tools you need to make a smart decision.

Which Brand Is Right for You?

When evaluating a fertilizer injector, the first key factor is reliability. A reliable fertilizer injector should produce repeatable results over time. Reliability also includes the service and support. No piece of machinery is going to work perfectly forever, so it's important to find an injector backed by a great service department that is knowledgeable and can react quickly if you have a problem. Ask other growers which injectors they use and what their experiences have been; often, their mistakes can help you gauge a product before you ever speak to a salesperson.

After reliability, the next most important factor to consider is ease of use. An injector that is easy to install and maintain will save you time, money and frustration in the long run and may justify the purchase of a slightly more expensive, higher-quality injector.

When it comes to fertilizer injectors, costs can vary widely, and it may be tempting just to buy the lowest-cost injector you can find. But buyer beware: Not all injectors are created equal. So make sure you know the answers to these questions before deciding based solely on price:

1. How accurate is the injector and for how long?
2. How does the injector compare to others on cost and performance?
3. What will maintenance cost?
4. How many years can I expect it to last?
5. How much time and money will it take should I need to repair my injector?

One Size Does Not Fit All

Once you've settled on a brand, it's time to consider the size of the injector you'll need. When it comes to injector size, the most important determining factor is flow rate.

Flow rate is how quickly water is flowing through water lines, measured in gallons per minute (GPM). Flow rate will depend on several factors, like the size of your greenhouse's pipes and the water pressure available to you.

Often, when I'm trying to help a grower decide on the correct size injector for their operation, I will ask how they are planning to fertilize their plant material. Will they be using one hose at a time? Will they be using drip tubes or overhead spray nozzles? Do they want to inject directly into their watering booms?

For example: If you plan to hand water with one hose at a time, with a ⅝-inch hose and a water breaker, you could safely use a small 14-GPM fertilizer injector. That injector would allow you the flexibility to use very low flow as well as up to 14 GPM.

Another example: You have a 1-inch line feeding 100 drip tubes. Each tube may put out .2 GPM of water. When you multiply those numbers you get 20 GPM for your flow rate. The injector you choose would need to be able to handle at least 20 GPM in flow.

To avoid damaging your new injector, it is vitally important to ensure that you select one capable of handling the maximum flow rate to which it will be subjected.

Setting Your Injector

Most growers are used to thinking about fertilizer in terms of parts per million (ppm). Fertilizer manufacturers put directions on the back of the fertilizer bags which tell you how to make up the ppm you need for the crop you are growing. However, when using a fertilizer injector, the measurements are usually listed in ratios. A 1:100 ratio means that one gallon of concentrated fertilizer will automatically be injected into 100 gallons of water. Your fertilizer injector will do this automatically for you.

If you are a new grower, 1:100 is an easy place to start when injecting fertilizer. As you become more familiar with ratios, you may want to experiment with your ratios to produce different results.

For example, if you use the 1:200 ratio setting, that means one gallon of fertilizer concentrate will make up 200 gallons of solution. Your fertilizer will be more diluted, but if your plants tolerate this level well, you will not have to make up your fertilizer solution as often.

Calibrating Your Injector

A fertilizer injector's purpose is to produce consistent results over time. But if the injector is losing accuracy, will you know? By using a calibrated EC meter on a regular basis, you'll be able to ensure your injectors are injecting the correct amount of fertilizer ppm.

Keep in mind that while a calibrated EC meter will help you maintain your fertilizer injector, the EC meter itself will require maintenance to ensure it is working accurately. Many growers forget this step and therefore believe their mix is accurate based on faulty EC meter readings.

Both the end watering solution as well as the stock solution should be checked for accuracy. You cannot tell if your injector is working correctly by how "blue" the water is coming out of your hose. Fertilizer dyes today vary widely, so color alone is a poor indicator of accuracy.

Finally, remember that, if you find that your solution is not correct, it may be due to an error in the way the solution was mixed and not the fertilizer injector itself.

Is Filtration Important?

The short answer? Yes, very.

Water quality will vary depending on your water source. Some growers will draw water from wells, municipal water supplies, ponds, streams, and some will have gravity feed systems. In most cases, using a good filter to rid your water of impurities like sand and grit will be beneficial not only to your fertilizer injector, but to all of your watering systems in the greenhouse. Filtering your water supply will protect your injector and greatly prolong its life, and it will help keep all the other nozzles and watering heads free of debris as well.

When choosing a filter, be sure the inside screen is a durable material such as stainless steel. In some cases, a disc filter may be a better choice. Also, a clean-out valve can really save time. Ask your irrigation supplier or distributor what they recommend.

What Is Water Hammer?

When water is moving in one direction and suddenly hits a closed valve, that water's energy will travel back through the water line at four times the original pressure. This surge of pressure is known as "water hammer." It can be extremely damaging to your fertilizer injector as well as other equipment in your greenhouse.

To help avoid this problem, you will need to install a check (one-way) valve or water hammer ➧

Maintenance schedules can vary based on usage, but in general, an annual check for worn parts is advisable.

arrestor after your fertilizer injector. This will stop that surge of pressure before it gets to your injector, thus saving it from damage.

Nobody Likes Maintenance

Most injector systems need some type of maintenance to run properly. Maintenance can be as simple as replacing worn seals, or flushing the injector out with clean water to avoid corrosion. It can mean protecting the injector from freezing temperatures in the winter by moving it indoors. Maintenance schedules can vary based on usage, but in general, an annual check for worn parts is advisable.

Other Uses for Fertilizer Injectors

So when is a fertilizer injector not a fertilizer injector? When it's injecting other chemicals, of course! Most fertilizer injectors can accurately inject pesticides such as fungicides and insecticides. Some injectors are capable of injecting water-treatment chemicals, such as chlorine dioxide. They can also be effective in applying PGR drenches, disinfectants and algaecides. Check with the manufacturer to be sure these substances can be injected without damage.

In my travels around the country, I hear the same questions about proper injector selection, use and maintenance from almost every grower I meet. Armed with the knowledge in this article and the other great resources available to growers (such as extension agents, horticultural distributors, universities and product manufacturers), you'll be able to put this technology to use more efficiently and with greater success than ever before. GPN

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