

# Keeping your injector at its best, so it doesn't get the best of you.

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Many growers, especially in the northern U.S., are beginning to crank up their greenhouses and start the spring season. There are always lots of things to do and think about when starting a new season. One often-overlooked detail is your fertility program. In this edition of e-Gro Alert we will discuss a few items to check out before production hits its peak to help avoid any nutritional problems.

## Injector Maintenance

Fertilizer injectors are one of those tools that we use everyday and we expect them to work when we turn on the hose, no questions asked. But when was the last time you inspected and/or did any preventative maintenance on your injector? Injectors are the heart of our fertility programs - if they aren't pumping correctly it will show in your crops. Simple maintenance

doesn't take very long and isn't very expensive... it will expand the life of your injector and ensure your crops are being properly fertilized.

Replacing seals on an injector is a great place to start and should be done annually, before the season starts. A



Figure 1. Salt residue build up.

seal kit is easy to acquire from your favorite supply company and will probably cost ~\$50 (a fraction of the cost of replacing an entire unit), depending on the brand and model that you have. The typical kit installation does not take long, 30 minutes, and includes re-

placing the injection stem o-ring, plunger seal, top dosing seal, top o-ring and the check valve assembly. Check to make sure that other o-rings not part of the kit are in good shape and replace any with signs of cracks or that have lost their round shape.

While you are replacing the seals and o-rings it is a good time to clean and inspect the rest of your Dosatron. All parts can be cleaned in warm soapy water, a toothbrush may be used if necessary to remove deposits (Figure 1) that build, especially if the injector sits unused for any long period of time. Next you will want to remove the filter from the body and rinse clean, if a lot of debris is present on the filter (Figure 2) that is a sign that your in-line water filter ahead of your injector is not working properly or is missing. This de-



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**e-GRO Alert**

Volume 1, Number 5  
February 2012

[www.e-gro.org](http://www.e-gro.org)

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**Figure 2. Clogged screen**

bris will cause scratches in the bell canister (Figure 3) and on the edges of the piston motor which will eventually lead to dosing inaccuracy, malfunction and the need for replacement.

Waiting 5 days for injector parts during the height of the season can be one of the most frustrating experiences. These simple procedures done before the season starts are the perfect insurance policy against a malfunctioning injector.

**Injector Calibration**

Once you have completed regular maintenance on your injector, it is important to calibrate it. Many injectors are adjustable, but the mark-

ings on the adjustment apparatus often leave something to be desired in the realm of precision. Conducting a calibration is necessary to be sure the injector is dosing at the desired rate.

There are two common calibration methods: the flow method and the EC (electrical conductivity) method. The flow method is a physical calibration, where the amount of stock solution taken up by the injector is com-



**Figure 3. Scratches on the inside of the canister of an injector due to wear.**

pared to the amount of diluted fertilizer discharged. The EC method checks the concentration of soluble salts

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in the discharged water containing diluted fertilizer.

If either method indicates your injector is not calibrated, adjust your injector up or down (depending on your results) and repeat the procedure until you are satisfied. Once you have calibrated the injector at the beginning of the season, repeat once a week during the season. Subsequent checks should take only a couple of minutes.

As Benjamin Franklin said, "An ounce of prevention is worth a pound of cure."

\*\*See the steps below in the blue box for both methods.



Figure 4. Click to watch a video demo of calibrating an injector

\*\*You can also watch a video demonstration of these two methods by clicking on the YouTube video in Figure 4.

**Fertilizer Calculations**

Do you double check the recipe you use when mixing fertilizer? Or, do you use the recipe written in faded marker next to the injector?..“Was the recipe for 15-0-15 or was it for

20-10-20, I don't remember...” You get the point. If you aren't mixing your fertilizer correctly, then no matter how well maintained or calibrated your injector is, you won't get the feed you are expecting. Check your math every time you switch to a different fertilizer. We've made it easy for you too. Just click here to use the UNH/NCSU FertCALC to take any guesswork out of the math. If you want a quick tutorial on how to use it, [click to watch this video](#).

Taking these simple steps before you start the growing season will help reduce the unwanted stress of nutrient problems. ❖

**Injector Calibration - Flow method**

Injector ratio = diluted volume ÷ stock volume

- Place 500 ml of stock solution in a graduated cylinder.
- Remove all air bubbles from injector lead and place lead in graduated cylinder.
- Run water through the injector, collecting fertilizer in a large container to known volume (eg., 5 gallons; larger quantities for high ratios).
- Measure how much stock solution was used (in ml).
- Convert diluted volume to ml.
- Divide diluted volume by stock volume.
- Injector ratio calculated should be within 1% to 2% of the setting on your injector.

Example: Injector ratio = 18,925 ml (5 gallons) ÷ 94 ml (amount of stock used)= 201

**Injector Calibration - EC Method:**

- Calibrate EC meter.
- Measure EC of clear irrigation water.
- Measure EC of irrigation water at the end of the hose after injector.
- Subtract EC of irrigation water from EC of fertilizer.
- Refer to fertilizer label.

Desired N Feed Rate	Injector Setting			E.C. Value (mmhos)
	1:15	1:100	1:200	
<b>50 ppm</b>	0.50	3.38	6.75	0.32
<b>100 ppm</b>	1.00	6.75	13.50	0.64
<b>200 ppm</b>	2.00	13.50	27.00	1.28

Example: You want to apply 200 ppm N of Jack's Professional 20-3-19 Petunia FeED Plus Mg. The clear irrigation water has an EC of 0.12, and the irrigation water at the end of the hose after the injector has an EC of 1.40. So, 1.40 – 0.12 = 1.28. Therefore, the injector is giving us 200 ppm N.

Cross-reference the values from the table on YOUR bag of fertilizer with the value you calculated from your EC values.