



St. Augustine Orchid Society

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## Applying Fertilizers and Chemicals to Your Orchids

by Sue Bottom, [sbottom15@gmail.com](mailto:sbottom15@gmail.com)

There are many ways to apply drenches and sprays of chemicals to your orchids. Drenches are applied to the media in the pot for uptake through the root system and transmission through the xylem upward through the plant. Fertilizers are most commonly applied in drench applications. Drenches also work for xylem mobile pesticides and fungicides. Spray applications are typically used to combat pests and disease on the aerial parts of orchid plants as well as for foliar feeding. Many of the chemicals used in spray application are contact killers so good coverage on both upper and lower plant surfaces is essential. Others are systemic to a greater or lesser degree so they can move within the plant to provide some protection to the plant from the inside out. Once you know whether you should be applying a given chemical as a spray or a drench, you next have to figure out how best to apply that chemical.

**Drenches.** Drenches are applied to the plant by saturating the potting media with the chemical for uptake by the roots. The simplest example of a drench application is when you add water soluble fertilizer to your irrigation water. You just mix up your fertilizer at whatever concentration you choose and pour it through the pot. Drench applications of fungicides are used to prevent bulb, stem and root rots as well as the water molds. Some of the systemic pesticides and insect growth regulators are also very effective when applied as a drench. One of the big advantages of drenches over spray applications is that your potential for chemical exposure is lower, as long as you follow precautions during mixing and applying.

*Large Jug.* If you only need to mix a small amount of fertilizer or chemicals to drench your orchids, it is simple to just use a gallon (3.8 l) jug. Fill the jug up halfway or so with water, add the fertilizer or chemical, then fill the jug the rest of the way. Pour the solution through your orchid pots. You can make as many jugs as you need, easy!



*Siphon.* For hobbyists with the need to mix up more than a few jugs of a drench solution, a siphonex may be the answer. A siphonex is a venturi device normally installed on the hose bib with the flexible suction hose dropped in a concentrated solution that is drawn into the hose by differential pressure. The [Hozon](#) operates at a 16:1 ratio and the [Dramm siphonject](#) has a 20:1 ratio, both cost less than \$30.

1. An eductor is a simple and cost effective way of applying chemical and fertilizer drenches, just double check the system to be sure it is mixing at the intended rate.

English Units: If you want to apply 16 gallons of fertilizer using a Hozon siphon, you would multiply your application rate by 16 to obtain the quantity of fertilizer to add to

each gallon of water. So, if you were applying fertilizer at the rate of  $\frac{1}{4}$  tsp/gal, you would create a concentrated solution by adding 4 tsp ( $\frac{1}{4}$  times 16) of fertilizer into a one gallon container, fill the container with water and drop the flexible suction hose into



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the container and start fertilizing. If you use the siphonex for fertilizing and you have a lot of orchids to fertilize, you can mix up your concentrate solution in a 5 gallon bucket. You would add enough of the fertilizer or chemical to make up to 80 gallons (16 times 5) and then fill the bucket with water to the desired level.

Metric Units: If you want to apply 20 liters of fertilizer using a Dramm siphonjet, you would multiply your application rate by 20 to obtain the quantity of fertilizer to add to each liter of water. So, if you were applying fertilizer at the rate of 0.33 ml/l, you would create a concentrated solution by adding 7 ml (0.33 times 20) of fertilizer into a 1 liter container, fill the container with water and drop the flexible suction hose in the container and start fertilizing. If you use the siphonjet for fertilizing and you have a lot of orchids to fertilize, you can mix up your concentrate solution in a 20 liter bucket. You would add enough of the fertilizer or chemical to make up to 400 liters (20 times 20) and then fill the bucket with water to the desired level.

The trick with using a siphon is to minimize pressure drop in your system. This means use a large diameter hose, keep the hose shorter than 50 ft or 15 m (35 ft or 11 m) is even better) and use a low pressure water breaker such as the Dramm 170. If you want to test how well your system works, get a measuring cup and large jug.

English Units: If you have the 16:1 Hozon siphon, you would fill your measuring cup with 8 oz of water and drop the suction hose in it. Then start filling an empty gallon jug that holds 128 oz. If your gallon jug is full of water when the 8 oz of water is gone from the measuring cup, you know that the 16:1 ratio is working (128 divided by 8 is 16).

Metric Units: If you have the 20:1 Dramm siphonjet, you would fill your measuring cup with 200 ml of water and drop the suction hose in it. Then start filling an empty 4 liter jug. If your 4 l jug is full of water when the 200 ml of water is gone from the measuring cup, you know that the 20:1 ratio is working (4000 divided by 200 is 20).

If the venturi stops working properly, sometimes an overnight soak in vinegar will remove deposits that plug the system and it will begin to siphon properly once again. The siphonex can also be used to apply drenches of fungicides and pesticides. Even with some of the more viscous chemicals, the suction tank does not seem to have such a concentrated solution that it plugs the siphonex. Frequent mixing may be necessary to keep the chemicals dissolved evenly in the solution.



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2. A Dosatron proportioner is a very precise way of delivering fertilizers although it may seem expensive if you just have a few plants.

pesticides can also be made with the Dosatron, but your stock tank will contain a very concentrated solution, and for some of the emulsified liquids and wettable powders, it may be so concentrated that it plugs the system. The Dosatron is best for materials that are completely soluble in water.

**Sprays.** Sprays are applied to the aerial parts of the plant, the leaves and pseudobulbs. If using a contact chemical, the spray must come into physical contact with the invader so it is important to cover both sides of the leaves, the leaf axils and the pseudobulbs to the point of liquid dripping from the plant. Systemic chemicals can be absorbed into the plant. Some are just absorbed and moved trans-laminarily through the leaf while others can actually be transported through the phloem system so they move throughout the plant. Obtaining complete coverage with systemic products is less important than it is with contact chemicals. In some situations you will be spraying only the flowers, such as when you battle Botrytis or thrips, so you want equipment that will deliver a fine mist to cover buds and open flowers.

*Dosatron.* Dosatron offers proportioners in which the device injects water from a concentrated solution tank into the irrigation system at a preset ratio. They even offer a system with a tank mounted on a portable rack. If you want an accurate water injection system without worrying about back pressure, Dosatron may be the answer for you although it is pricey costing over \$300. If you set up your Dosatron at a 100:1 ratio, you can mix up the amount of fertilizer needed to make 500 gallons of fertilizer in a 5 gallon bucket (similar to 2000 liters in a 20 l bucket), and then just water and fertilize your orchids until the bucket is empty. As long as you hear the Dosatron clicking, you know it is working. Sophisticated growers may have several Dosatron injectors inline injecting different chemicals and/or fertilizers at different rates. Drench applications of fungicides and



3. Hose end sprayers allow you to mix chemicals in the desired proportion for easy spraying. If you cannot find the old-fashioned kind without the top heavy gizmos, try a nozzle end sprayer instead. You can also buy premixed formulations in a container that you simply attach to a hose and spray.



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*Hose End Sprayers.* Sprayers that fit onto your hose make it easy to spray fertilizer onto exposed root surfaces as well as to broadcast spray chemicals, particularly under benches. Ortho and other manufacturers have unfortunately redesigned their hose end sprayer and added gizmos that reduce pressure and spray distance resulting in a poor spray pattern. If you cannot find one of the old fashioned hose end sprayers, consider buying a nozzle end sprayer instead.

When using the hose end sprayers, set up your sprayer to use the highest dilution rate. Say you want to spray fertilizer onto mounted orchids or vanda roots. Estimate the number of gallons of fertilizer solution you need and divide this number into the capacity of the sprayer reservoir so you know what dilution rate to set on the upper spray dial. If you want to spray 4 gallons (15 l) of fertilizer, you would fill the reservoir to the 32 oz (950 ml) mark and set the top dial to 8 oz/gal (32 divided by 4). If you apply fertilizer at the rate of  $\frac{1}{2}$  tsp/gal (0.65 ml/l), you would add 2 tsp (10 ml) fertilizer to the reservoir ( $\frac{1}{2}$  times 4) and you're ready to spray. The old fashioned hose end sprayer is also great for disinfecting surfaces on and under benches. You can spray pure bleach at the highest application rate to spread a 6% bleach solution. Spraying contact chemicals on your plants with a hose end sprayer is a messy proposition. If you get good coverage on the plant leaf surfaces, you will most likely be covered with toxic chemicals as well. Either choose a more suitable spray method or wear lots of protective clothing to limit your exposure.



4 The nozzle end sprayers have a much more directed spray pattern that give you better coverage, whether you are applying fertilizers or chemicals.

rather than tablespoon metering, unscrew the bottle and remove the feed tube that sticks into the bottle, unscrew the adapter from top of metering dial and screw it onto the feed tube connection and then reinstall the feed tube, and the sprayer will then be calibrated in teaspoons per gallon rather than tablespoons per gallon. At the highest nozzle setting, you can spray a 4% solution. The reservoir has side markings in ounces and milliliters. To continue the math example from the previous example, if you want to spray 2 gallons (8 l) of fertilizer, you would set the top dial to the highest setting of 10 tbs/gal (5 fl oz/gal or 20 ml/l) and fill the reservoir to the 10 oz (300 ml) mark (2 times

*Nozzle End Sprayers.* Several companies make sprayers equipped with a nozzle that sprays at a higher pressure so you can get a more directed spray pattern, with the net result that most of the spray gets on the plants rather than on you. The sprayer comes out of the box with top dial settings that allow you to select from 1 to 7 or 10 tbs/gal (9 to 64 or 92 ml/l) application rates. You can change this to 1 to 7 or 10 tsp/gal (3 to 21 or 30 ml/l) by changing the orifice, although the procedure for doing this is not particularly intuitive. To use teaspoon



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5). If you apply fertilizer at the rate of  $\frac{1}{2}$  tsp/gal (0.65 ml/l), you would add 1 tsp (5 ml) fertilizer to the reservoir (1/2 times 2) and you're ready to spray.



5 Pump up or battery powered sprayers are a simple way of spraying the aerial portion of plants, here flower buds are being 'poofed' for thrips control.

thrips and *Botrytis*. If you ever find yourself in the unenviable position of having a thrips infestation, a twice a week poofing program in which every bud and open flower is sprayed, front and back, for 4 or 5 weeks will help you get the thrips under control. You may tire of having to pump up the sprayer and decide a battery operated system is more to your liking. These are more versatile and it is easier to get a better spray pattern given the higher pressure. A battery operated spray system may be the better choice for larger collections or when you want to get good leaf coverage with pesticides and fungicides. As always, wear protective clothing to prevent contact between you and the chemicals.



6. The plants can all be fogged using a spray gun powered by an air compressor. The inhalation and dermal absorption hazards are high when applying chemicals this way so wearing protective equipment is a must.

*Mechanical Sprayers.* There are many different types of sprayers available in a wide range of sizes for spraying contact chemicals onto aerial parts of plant. The main variable is the mechanical force used to deliver the chemicals, usually either pump up sprayers that are pressurized by pumping air into the tank, or are battery operated. Some are small enough to be hand carried, some are back pack sprayers, others are mounted on wheels and still others are fixed tanks fit with long hoses. The cheapest sprayers are the small pump up sprayers that are fine for small collections or for "poofing" flowers and buds to protect against

*Spray Gun.* I asked George "The Toolman" Hausermann of EFG Orchids how he prevented *Botrytis* from occurring in his growing area. He smiled and showed me a spray gun he had hanging on a hook. This sprayer is more commonly used for applying paints and lacquers, with a 1 quart (950 ml) reservoir and powered by an air compressor. It delivers a spray pattern that can be varied from a long jet to a fine mist. This system is ideal for foliar feeding or applying a fogging mist of chemicals. Of course, you are at an extremely high risk of inhaling the fine mist so respiratory protection is non-discretionary. You must wear an organic vapor respirator, no ifs,



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ands or butts. Do not forget to don protective clothing, boots and gloves to keep a barrier between you and the chemicals.

*Foggers.* Commercial growers might also use atomizing foggers in their growing areas. These are often stationary devices set to operate in a closed growing area that is not reentered until deemed safe. This type of system is probably beyond the scope of most hobbyists.

Be sure to read, understand and follow all label instructions. These chemicals are poisonous to humans as well as to whatever pest or disease you are trying to combat. Make sure you apply the chemicals correctly, at the proper application rate and with adequate protection to your body. Gloves are important, particularly when mixing and spraying chemicals, as are long sleeved pants and shirts and eye protection. If there is any chance that you will become wet with spray, wear a liquid-proof, chemical-resistant coverall or suit with a hood to prevent skin contact and dermal absorption of chemicals. Inhalation of chemicals is a primary mode of entry to your body during spraying, and fine mists are particularly hazardous because they can travel deep into the lungs. Organic vapor respirators should be worn when using atomizing mists of biofungicides, insecticides, fungicides and products containing trace elements. Follow the label instructions so you will be around next year when your orchids come into bloom.