

Using Proportioners

OK, so you finally realised that rather than making up multiple batches of fertiliser, insecticide etc you can save a great deal of time by buying a siphoning device or hose-end type sprayer from the Orchid Tray Company at a show or club meeting. All proportioners are sold with instructions on use but like mine I would wager that many of these devices sit on a shelf unused waiting for a day until I have time to figure out just what those instructions mean. A broken foot some months back gave me just that opportunity.

► Let's start with the siphoning devices:



Both of these siphoning devices have a fixed ratio, of 16:1. What that means is that the device will have a total output of 16 times the volume drawn by a vortex action through the chemical siphon hose. The chemical siphon hose is the little black hose in the bucket in the centre photo. All you need to do is determine the final concentration and how much of that final solution you want (or how much of the concentrate you wish to mix).

The formula to work this out is:

$$(\text{mls. per litre desired}) \times (\text{ratio of proportioner}) = (\text{mls. per litre of concentrate})$$

So in our example, each litre of concentrate will produce 16 litres of final solution. If in the instance we want an insecticide to be delivered at 1 ml per litre, we will use $1 \times 16 = 16$ ml of insecticide to mix up one litre of concentrate to be siphoned by the device.

An alternative may be the fertiliser manufacturer's recommended rate of 5 gm per 10 litres (= $\frac{1}{2}$ gm per litre) and then we will use $\frac{1}{2} \times 16 = 8$ gm (1 $\frac{1}{2}$ to mix up 1 litre of concentrate.

Many folks will mix up either 10 litres (bucket size) or 20 litres of concentrate at one time. So for the typical manufacturer's recommended rate of application of 5gm / 10 litres they would use $8 \text{ gm} \times 10 = 80 \text{ gm}$ (16 teaspoons) for 10 litres or $8 \text{ gm} \times 20 = 160 \text{ gm}$ (32 teaspoons) fertiliser to make up the 20 litres.

For a 'half dose' application of fertiliser they would use $4 \text{ gm} \times 10 = 40 \text{ gm}$ (8 teaspoons) for 10 litres or $4 \text{ gm} \times 20 = 80 \text{ gm}$ (16 teaspoons) fertiliser to make up the 20 litres.

As long as you can keep the mixture from evaporating from the container any leftover should be usable at a later time. The mixture will not deteriorate.

For safety reasons, DO NOT mix up large volumes of pesticide concentrates and save them. Mix up only what you need for each application.

► Lastly, the hose-end sprayer:



The Hortex Hose-end sprayer can be used to deliver fertilisers, as well as insecticides, fungicides etc.

With fertilisers the sprayer can be used to deliver either powdered or liquid fertiliser concentrates and to achieve the correct output target involves virtually the same method for both.

With powdered fertiliser concentrates that need mixing in water the hose-end sprayers can be the most complex devices to use properly because there are two variables to consider: The tank size and the concentration dilution rate of the concentrate.

The Hortex tank is calibrated in mls and holds 500 ml of liquid concentrate. The output ratio dial can be adjusted from 3ml/litre to 31ml/litre in one configuration or 1ml/litre to 10 ml/litre in a second configuration. Instructions as to how to configure your sprayer to either of these settings are detailed on the sprayer packaging and the bottle. For fertilisers a setting of '1' can be used for most applications. There are other cheaper but similar sprayers on the market that only have one method of configuration and that is graduated in teaspoons and the dilution calculation is the same as for the Hortex. A metric teaspoon is equal to 5 ml/gm.

The manufacturer's recommended delivery rate of most powdered fertilisers is 5ml (1 teaspoon) to a 10 litre bucket and using the old adage of fertilising "weekly weakly" the desirable delivery rate of ½ strength is 2 ½ ml (½ teaspoon) to a 10 litre bucket.

Achieving your fertiliser delivery aim is accomplished by adjusting both the amount of fertiliser dissolved in hot water and your selection of a delivery setting.

Just how much powdered fertiliser do we mix with hot water? In a large container If we mix 1 kilo of fertiliser with 1 litre of hot water a concentration rate of 1 gm/ml is achieved. If we fill the 500ml tank with this solution and set the rate on the Hortex to deliver at the 1 ml/litre setting a total output per filling of 500 litres will be achieved. However, this setting has delivered at 5gm/5litres which is twice the recommended 5gm/10 litres and 4 times the ½ strength intention. Therefore, we should mix 500gm/1/2 kilo of fertiliser in 1 litre to obtain the 5gm/10 litre full strength objective. A total output volume of 500 litres is achieved at this setting.

How do we get ½ strength delivery? We are looking for a ½ teaspoon/2.5 gm to 10 litre yield. There are two simple

methods. Firstly, you can mix 250 gm of powdered fertiliser to 1 litre of hot water to obtain a concentration rate of ¼ gm/ml and an output rate at setting 1 of 2 ½ gm per 10 litres. Secondly, take 250 ml of the 500 gm/litre concentrate and add 250 ml of water and again use the '1' setting on the Hortex. Once again a total output volume of 500 litres is achieved at this setting.

Keep in mind that there's a solubility limit with powdered fertilisers, so if you adjust the ratio for too high a ratio, you would need more fertiliser than you could physically dissolve in the water. If your fertiliser solution needs are large, you would be better off getting a proportioning pump of some sort that feeds directly into your watering hose.

For fungicides, insecticides etc where a per litre output is commonly recommended the concentrated product is added directly to the Hortex bottle and the recommended mixing rate set on the dial.

Adapted by Mike Hitchcock of the Orchid Tray Company (www.orchidtrays.com.au) from an article sourced from the First Rays LLC website located at: <http://www.firstrays.com/>