



How to set up irrigation systems in your greenhouse

By Bill Keene

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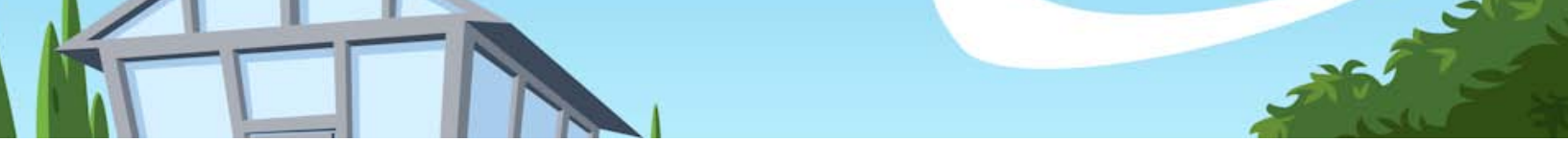
Apart from good soil or potting mix, the most important thing your plants need is good water management. Hand watering is the most common method of providing water to plants in a hobby greenhouse. However, considering that many people work away from home during the day, you might want to explore other options for irrigation that ensure a regular and efficient supply of water to your precious plants. Nothing can send you so quickly on a guilt trip than damage to your plants due to lack of adequate watering! Options include use of capillary mats, drip irrigation, and overhead misting and sprinkler systems. You can get DIY systems from the market and set them up yourself.

Hand watering: You can use a watering can or a gardening hose to water your plants. The good part about hand watering your plants is that it gives you the chance to inspect all your plants personally and frequently which keeps you informed about the health of each member of your collection. Also, though hand watering needs more efforts on your part, it allows the freedom of assessing and catering to the needs of the different plant types individually. This means that you can soak some of your water loving plants more while skipping others which need less frequent watering. Another advantage with hand watering is that you can grow a mix of plants with varying water requirements.

When hand watering your plants, use attachments on the hose or the watering can spout to regulate the flow of water to prevent splattering. A rose attachment on the watering can, or water breaker or fan spray head on the nozzle of a hose allow the water to fall in gentle sprays that wet the soil without washing it out of the container.

Capillary mats: These can be used when you have a number of similar plants in small pots to water and keeping leaves dry is a major concern. The capillary mat absorbs water and passes it on to the soil through the bottom of the pots keeping it sufficiently moist to meet the water requirement of the plant. Water supply is adequate, regular, constant and just right for the plant. Synthetic fiber mats available in stores are easily handled, light weight, strong, rot resistant as well as bacteria and mildew resistant. Use on a level bench. First cover your bench with a plastic sheet for protection. Get a mat that is just a little smaller than your bench. Place your pots on the mat and wet it by hand or use a drip hose with a timer setup. You can have a reservoir adjacent to the capillary mat which you can manually fill with water or set up an automated filling system. The mats can be easily cleaned by washing.

With a well-stocked greenhouse, you would have to think of more suitable approaches to irrigation such as overhead sprinkler and misting systems, seep hoses and drip irrigation. Many of these offer the option of automation to varying degrees using timer and control devices. You can



attach water timer devices between the tap and the hose and set them to run at regular intervals for specific periods of time to keep the soil sufficiently moist. They are definitely useful if you are away all day at work. Of course, if you are really into high tech watering, there are more amazing and sophisticated options that include sensors to measure soil moisture and maintain optimum conditions at all times. Yes! These come at substantial additional cost!

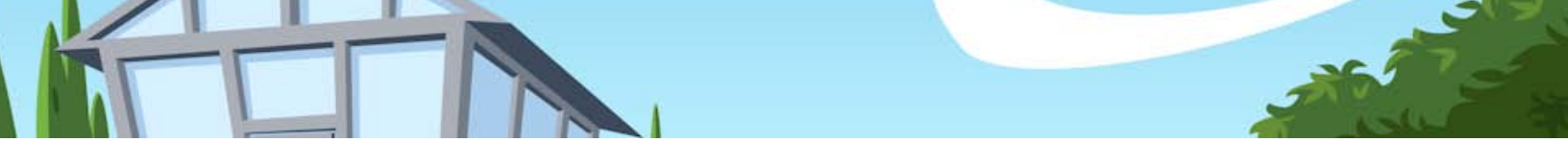
Seep hoses are relatively simple systems that consist of hoses with thousands of tiny perforations that deliver water steadily and efficiently to the plant roots. Water slowly leaks out of the perforations along the length of the hose to supply water to the plant roots. The tubing is buried two or three inches into the soil, thereby reducing loss of water by evaporation. As leaves are left dry, this method is particularly suited to plants that are at risk for mildews or moulds when leaves are coated with a wet film of water. Root formation that occurs with this system in place is stronger; growing downwards for better anchoring of the plants.

Drip irrigation works on a similar principle of supplying water directly to plant roots through tiny holes in the hose. The difference is that the tubing lies on the surface of the soil.

Overhead watering systems are great water savers and can be used in your greenhouse if you cannot regularly spare the time to hand water your plants or if your greenhouse is too large for you to think of hand watering. **Misting systems** are ideal for tropical plants and epiphytes that need high humidity in the air. Automatic timers can be installed to control the amount of water your plants receive. You would need to carefully manage the overhead **sprinkler system** to accommodate the needs of all your plants. Low volume sprinkler systems allow you to have more control over the spray pattern. Overhead sprinkler systems or bench top sprinkler systems can be assembled to provide water efficiently with uniform coverage for plants placed on benches or on the floor.

DIY misting systems are ready-to-assemble PVC misting kits that can be attached to standard hose faucets. They can give good mist coverage with significant temperature reduction to prevent heat stress to your plants. Misting gives you the opportunity to control humidity and growing environment which aids in the propagation of plants that might otherwise be difficult to grow. Misting is particularly useful in rooting of stem cuttings and propagation of some plants. Misting works by spraying fine droplets of water at regulated intervals over plants that are being propagated. The fine mist moistens the surface of the plant while cooling the overall environment and fulfilling the water needs of the plants. The thin film of water prevents the foliage from drying out. Though seeds and seedlings do well with misting systems, it is truly beneficial to propagation of leafy cuttings which tend to form roots more quickly, with more certainty and in greater numbers when misting is used.

When working with misting systems, you have to be particularly careful about minimizing draughts of air as these disturb the even distribution of the mist resulting in disturbed water coverage of your plants. Secondly, it is important to check that all the misting heads are in working



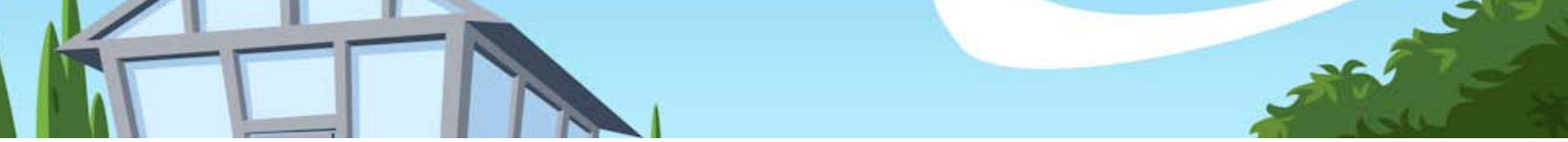
order. Clogging of any of these will again cause uneven distribution of water. Also, hard water can be a problem not only because it will eventually lead to clogging of the misting heads, but also because it can lead to damaging deposit of minerals on the leaves of plants. The alternative to the problem is to have a method of softening the water or to collect and filter rainwater to run your misting system.

Misting systems can be installed as small portable misting sticks for a small greenhouse to sophisticated systems with thermostats, automatic controls and soil warming systems to promote root formation, maintain humidity and moisture. These provisions automatically increase the success rate of rooting of cuttings and plant health by guarding against both, wilting and scorching. Plants that are known to be at risk from rot may not be good candidates for misting systems as the system covers the leaves in a fine film of water.

Drip irrigation is a low pressure water delivery system that supplies water slowly, drop by drop to plant roots. Drip irrigation works really well in areas that chronically face water restrictions or water shortages. It is a good option for regions with high energy and pumping costs. Drip uses up to 50 per cent less water to irrigate the same quantity of plants than do conventional irrigation methods. If you are looking for precise and efficient watering system that works at low operational costs and saves water, drip irrigation is for you. The systems are easy to assemble and install. All you need is a pair of scissors to cut the tubing to appropriate length and a hole-punch to insert drippers and connectors. You do not need any technical skills to get this system up and running. So, save costs by installing the system yourself. Hand-tighten all threaded parts and use fittings that can be pushed into place. You do not need any fancy tools. It is possible to set up the system in a couple of hours by yourself without any hassles. Attach one end of the main tube line to your water source – the nearest tap! The main line supplies water to individual drip lines which pump out water at low pressure to the plant roots.

Apart from the obvious benefit of saving water, drip irrigation scores over sprinklers because there is no overspray or evaporation loss. This translates into economy on your water bill as well as pumping costs. Since you control the rate of watering, there is no wastage of water to form puddles, pools or runoff. As you eliminate runoff, you also eliminate the possibility of erosion. Your plants get exactly what they need and you do not have to soak all of the soil or saturate the entire bed.

Drip system delivers water below the surface and helps keeps the top of the ground dry. This is not suitable to most weeds trying to take root and incidence of weeds is largely manageable. They are easier to pull out because the soil is not compacted due to surface watering as is the case with sprinklers or hoses. Your plants are healthy and yield is increased because roots always stay moist. The plants are not subjected to cyclic soaking and drying-out. Leaves that are covered over by water droplets are more susceptible to sunburn on hot days with direct sunlight streaming in. With your leaves remaining dry, the possibility of damage is substantially reduced. Fungus and insects also are restricted due to lack of pervasive wetness in the soil and on the plants. You have the choice of watering any time of the day, even when the sun is high because you wouldn't be



wetting the leaves. If you are still not convinced, another argument in favor of drip irrigation is that it benefits friendly soil enriching worms and microbes by allowing the soil to remain well-aerated due to non-compacting and due to adequate quantities of moisture for the friendly organisms.

Drip irrigation is not only durable, but also easy to automate with a timer device that can be easily programmed. You can set all your watering worries aside if you are planning a vacation! The greenhouse will manage very well on its own if basic precautions are taken before you leave.

All growers who use drip irrigation with similar plant groups have the great advantage of adding fertilizer in liquid form to the water system. You can install slow release devices that will regulate the liquid feed to your plants. No plant feed can compare in efficiency to liquid feeds delivered directly to the roots. These are much more preferable due to their ability for ready absorption and immediate usage. There is a visible difference in yield and quality of plants that are watered and fed through the drip system. Once you have used it, you wouldn't be satisfied with any other method!

Watering system that you use for your plants in the greenhouse will ultimately determine the quality and yield of your plants. With hand watering, you have to make extra personal efforts, but with more efficient and automated systems, greenhouse gardening becomes a lot easier and effective. Take your pick of watering systems from the ones described above. As a greenhouse owner, my personal experience says that automated drip irrigation wins hands down!