

Flood floors are most often seen in large operations, but they should be easily adapted to smaller greenhouses. A good addition to flood floors is the installation of hot water lines in the floors to provide heating. Space utilization on flood floors can be very good, but a common complaint is the added labor in handling plants.

Trough systems

Trough systems are benches with tops that are parallel rows of troughs rather than a solid surface (Figure 3). The pots are not flooded as in ebb-and-flow, but the water is delivered at the higher end of the trough and runs in a stream to the opposite end. The stream of water comes in contact with the pots and water is taken up by capillary action through the holes in the pots.

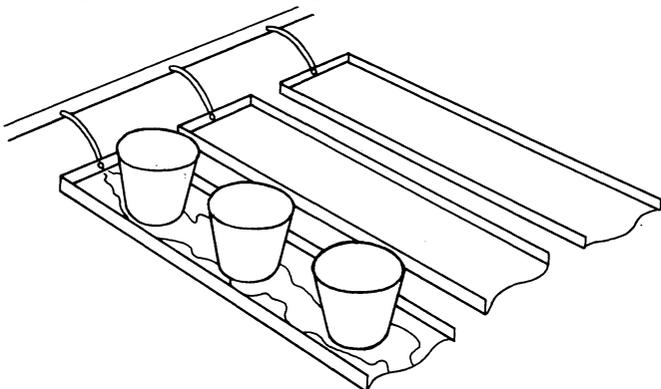


Figure 3. Trough irrigation system with pots sitting in water stream.

Trough benches are cheaper than ebb-and-flow systems, and they allow for better air movement up through the plant canopy because they are not a solid surface. Due to the inflexibility in spacing however, they work best for growers that produce a large number of uniform sized plants. A common problem is the need to reposition plants in the trough so that each plant is contacted by the stream of water. Some growers alleviate this problem by placing a strip of capillary mat material in the trough and, essentially, conducting capillary mat irrigation.

Capillary mat watering systems

Capillary mat watering systems have existed for many years in one form or another. The design is generally simple and costs are low in comparison to other watering systems such as ebb-and-flow or spaghetti tubes. The basic design has been successfully adapted to numerous growing situations in Florida.

The basic design of the capillary mat system is one that delivers water to a fibrous mat, usually 1/8 - 1/4 inch thick, that absorbs water. Pots are placed on the mat and water moves from the mat into the pot by capillary action (Figure 4). There are numerous types of mats made from lint, cellulose or other materials. The mat is placed on top of a layer of plastic and covered with another layer of opaque plastic. Opaque plastic, usually black, is used in order to prevent algae growth on the mat. The top layer may have holes cut where pots are to be placed to allow contact between the mat and the drainage holes of the bottom of the pot. Another option is to use a perforated plastic that has small pin-sized holes that allow water movement from the mat to the pot. This option reduces light penetration to the mat and roots are less likely to grow into the mat. One disadvantage to this type of plastic cover is that, if the water source is high in salts, the salts tend to accumulate and block the holes. The salt accumulation may be removed by brushing the plastic or by spraying the mat with clean water. In some cases the bench is slightly elevated at one end and a catch trough is placed at the low end of the bench. This allows for any water that may run off the bench to be collected and recirculated.

Water is delivered to the mat through the use of polyethylene drip tubes. Many types of tubes have been successfully utilized. The water pressure required will be dictated by the type of tube. Excessive water pressure will rupture the lightweight tubes whereas too low a pressure will result in poor water delivery and distribution.

Mats have been used on benches and on ground beds. The most important design factor is that the

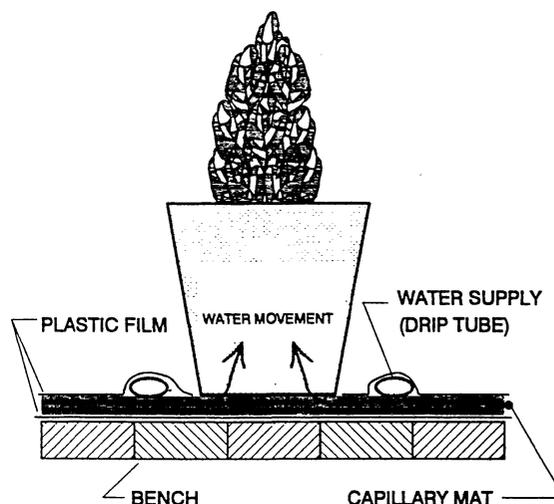


Figure 4. Capillary mat irrigation system as constructed for a bench top.