This article was listed in Forest Nursery Notes, Winter 2008

10. Growing shrub liners on flood floors. Joeright, D. International Plant Propagators' Society, combined proceedings 2006, 56:430-431. 2007.

Growing Shrub Liners on Flood Floors©

David Joeright
Spring Meadow Nursery, 12601 1 20th Ave., Grand Haven, Michigan 49417 U.S.A.
Email: "Dave Joeright" <dave@springmeadownursery.com >

A flood floor is an ebb and flood system that utilizes the concrete floor of a greenhouse as the water basin for subirrigating a crop. Plants are grown directly on the floor. All water is recycled and stored in large water storage tanks. The growing area is flooded with 1–2 inches of water, which is absorbed from the bottom of a container through capillary action into the growing medium. Generally flood floors are divided into sections or irrigation zones, which can be flooded separately. This technology is often utilized in monoculture production settings with container-grown crops. More recently it has been used in production of bedding flats, liners, and even plugs.

We have found that there are several advantages in using flood floor technology to grow shrub liners: consistency of water delivery, crop uniformity, reduced foliar diseases, reduction in water and fertilizer requirements, reduced labor, and zero water run-off. Foliar diseases spread by splashing water can be eliminated in a flood floor environment. Fertilization in a subirrigation system generally requires only 1/2 of the concentration as overhead watering, but soil EC should be monitored carefully, as salts can build up in the growing medium because they are not leeched as they are in overhead irrigation systems. Water absorption is also very uniform across a crop, ultimately resulting in greater crop uniformity. Most flood floor irrigation systems also incorporate floor heat, provided by an underground system of hot water pipes within the concrete floor. Floor heat can allow a grower to dry the floor when weather is less than desirable, as well as provide increased temperature of the root zone promoting additional root growth during cooler months of the year, which is important in the production of shrub liners.

Some challenges with producing shrub liners on flood floors are: high cost of installation, the need for water filtration, managing and coordinating different species, different aged crops, and different sized liner cells in the same irrigation zone. Different sized containers, and different sized plants will have different water requirements. Flood floor irrigation zones are often very large. This can make it challenging to group crops with similar water requirements together in a liner production setting. In any water recirculation system, the spread of disease through irrigation water can potentially become a problem. The most important aspect of water treatment in a recirculation system is filtration. For most pathogens to survive in water, a source of organic material is required. Organic matter must be filtered out of the water to prevent pathogens from existing in water storage tanks and plumbing pipes. A filter of < 30 microns will typically remove most organic matter capable of harboring pathogens. Other methods of water treatment and disinfection have recently become synonymous with flood floor irrigation systems and water recirculation systems, including chlorine, ozone, heat pasteurization, hydrogen per-

oxide, and ultraviolet light. All methods provide some additional sanitation after filtration, although which method is most effective is often debated. Root pathogens often seem to be not only species specific, but cultivar specific. When growing multiple genera, species, and cultivars in a flood floor system, total crop failure due to disease is very rare. We have learned of some species and cultivars that do not perform well in our flood floor environment. We have found many that perform very well and result in a better quality liner.