The following short papers by Richard Watson; Dale Deppe; Elwin Orton; Ralph Freeman; Dan Gilrein; Murdick McLeod and Scott Clark; and Margery Daughtrey, W.S Clark and M.T. Macksel were part of a **Helpful Hint—Solutions to Common Problems** panel moderated by Dale Deppe.

Use of Spunbonded Fabric Grow Covers in Deciduous Seedling Production

Richard E. Watson
Watson's Nursery, 6140 Bond Road,West Valley, New York 14171

During 15 years of deciduous seedling production my greatest obstacle to good germination and survivability has been our spring weather that is typified by prolonged cool wet spells followed by sunny days with many frosty nights. The frosts rarely killed outright, but rather seedlings appeared to get progressively weaker with each frost making them more susceptible to damping-off Surviving plants usually grew slowly until the warmer weather of June.

After many trials over several years with different covers and supports I settled on the following system. In early spring prior to germination we cover individual seedbeds with 10 ft wide freeze covers weighing 1.5 ounces per yard and later with grow covers of 0.6 ounces per yard. These tarps, manufactured by Kimberly Farms, are made of UV-stable, white-polypropylene, spunbonded fabric and are porous to water and self-ventilating.

The tarps are supported on 1/2 in. PVC pipe hoops fitted on 18 in. steel stakes which have been driven halfway into the ground, 48 in. apart over our 36 in. wide beds Hoops every 4 ft down the length of the bed provides a tunnel support for the tarps with a clearance of 18 to 24 in. at bed center. The sides of the tarps are secured down with boards and concrete blocks.

On frosty nights and during cool, wet weather tarp ends are closed down, otherwise they are left rolled up. We maintain 5 to 12°F warmer temperatures under these closed covers. After danger of frost has passed and with warmer weather we ventilate more as each species dictates by switching to the lighter tarps or by opening short sections of tarps in the middle of beds

I have found not only better germination with less damping-off, but also much larger and more vigorous seedlings. For example, without fabric covers 1-0 *Cornus mas* ranged 2 to 9 in. tall, with fabric they are 6 to 24 in. tall.

Though porous to water, penetration is not uniform, particularly with brand new tarps. The heavier fabric especially sheds much water. Actually during the spring I believe this is of benefit keeping the beds drier and warmer, hence less prone to damping-off.

When seedlings are 2 to 6 in. tall the beds are uncovered for weeding, fertilizing and a thorough irrigation as well as for disease and insect control. Insect populations have been down considerably with a few exceptions. Irrigation also continues over covered beds as needed through the summer.

Lack of uniform water penetration has not noticeably affected germination or growth except when attempting to germinate surface sown seed like *Betula* where consistent, even moisture is critical We solved this problem this year by running an irrigation line with 4 ft square pattern micro-nozzles hung under the tarps from the hoops.

Another use that looks promising in early trials is for autumn frost protection of late tender growth of species, such as *Parthenocissus tricuspidata,* which is prone to such damage.

Almost all materials in these cover systems are reusable many times. Still being used are some of the heavy tarps first used in 1988 The light tarps are usually used two or three times.

I feel these fabrics are giving me the opportunity to stay competitive with the many nurseries that have milder spring weather and longer growing seasons because the "greenhouse effect" of these fabrics is providing us better frost protection and greatly enhanced growth.