

time researching, experimenting, and discussing with numerous growers our mechanization (and perhaps automation) of the entire shipping operation. Palletizing will definitely play an important part in this handling. We do feel our finished product will be unique and I will be most pleased at a later date to explain this entire phase of our operation.

In summarizing then — our idea is to eliminate hand labor wherever feasible. It may be hard to believe, but employee resistance to mechanization and automation is one of the bigger problems, especially with older employees. One of the phases we are working on now is to psychologically prepare our people for these changes, which will make their work easier and less costly for us. This can only be done through standardization and using as many machines or systems as is practical.

MODERATOR PINNEY: I'm sure all of you were as interested in this talk as I was and I'm sure Mr. Robinson will be having some visitors at his nursery in the near future. We are a little behind schedule and will not have any questions this time. Our next speaker is Dick Bosley. Dick has helped us in our nursery operations many times and it's a real pleasure to ask him to speak to us now.

WATER — FRIEND OR FOE?

RICHARD W. BOSLEY

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My paper will probably be one of the shortest ever given but I feel the message it contains can be very important to you.

At the Bosley Nursery we have been propagating a similar line of plant material under mist with the same water source for a number of years. We have never had as high a rooting percentage as others in this Society profess to achieve but then we didn't always tend to believe some of the figures we heard. In the 1968 summer and fall propagation season our results were even worse and it prompted us to have the mist water checked for agricultural suitability. We found the total soluble salt content to be moderately high for mist propagation of azaleas and rhododendrons. What was even more damaging was that the concentrations of both sodium and chloride were high for these sensitive crops.

The choice became: 1) find a new source of a better quality water; 2) install de-mineralizing equipment; or 3) stop growing those crops. We chose to install city water which is of much better quality. The results are that the crops no longer show the high salt type of injury and the rooting stands are now of an order equal to or higher than those which others boast about.

The deterioration of our well water probably occurred gradually over a period of years thus not causing us to suspect it as the source of trouble. I would urge the States to establish water quality standards, if they have not already done so, and encourage growers to have their propagation water, in particular, checked if they are showing any salt injury on the leaves or roots of cuttings. The problem is severe under mist because of the nature of application. Most all of the salts in the water end up concentrated on the leaves due to evaporation, as there is little or no leaching, such as you would get under an irrigation system.

MODERATOR PINNEY: I imagine your paper will go on record as one of the shortest we have had but we appreciate the information very much. I know of one instance in Wisconsin in which a considerable amount of money was spent over a two year period trying to determine what was wrong and the trouble turned out to be the source of water. At this time I'd like to introduce the next speaker, Dr. Harold Pellet, who will speak on the relationship of rootstock to maturity and cold hardiness of the scion variety in apples.

RELATIONSHIP OF ROOTSTOCK IN THE APPLE TO MATURITY AND COLD HARDINESS OF THE SCION VARIETY

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INTRODUCTION

Even though the art of graftage has been known and used in plant propagation for centuries relatively little is known about stock-scion relationships. There has been quite a bit of work done to study the influence of rootstock on plant growth and some on nutrition but very little work has been done to study the influence of rootstock-scion interactions as they might affect hardiness.

The rootstock could affect scion hardiness in one of several ways. Hardy rootstocks might induce hardier scions strictly through their use. The root system of certain rootstocks may have the ability to survive or escape root injury where other rootstocks cannot. In studies at Minnesota we have found that there is quite a range in hardiness capabilities of the various Malling and Malling-Merton stocks. Other workers have reported similar results (1, 2). Certain rootstocks may, due to earlier maturity or later bud-break, enable a scion variety to escape early and late winter injury by hardening earlier or de-hardening later. The rootstock may enable the scion to develop greater hardiness than it could if grown on its own roots. Perhaps the rootstock does not influence the scion hardiness in