COPING WITH ADELAIDE'S WATER SUPPLY USED FOR PROPAGATION

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This is not a scientific presentation but a factual record of the strife a plant propagator can get into if the quality of the water one is using is taken for granted.

When we began our nursery, life was fairly straightforward. Seeds were sown, cuttings were planted, and we enjoyed reasonable success with the majority of lines attempted.

In the summer of 1980/81, however, our results began to deteriorate and in the next two years it seemed that we may have to give up propagation. We could not get roots on *Lamium* or *Maranta*. *Asparagus densiflorus* 'Sprengeri' seeds were reluctant to germinate, though *Dracaena draco* was still cooperative. All the trays on the heated benches were looking dreadful.

The chemical analysis of the propagating mix began to tell a story, though their correct interpretation took some time.

The test results were:

	pH	*Salinity (E.C. × 103)*
Propagation mix before use:	4.9	2.55
Propagation mix taken from trays after 4–5 weeks	4.3	6.7
Optimum values:	6.0	less than 3.0

The mix used was basically the one recommended by Cornell University as described in Hartmann and Kester (1), but it was obviously too acidic. The salinity levels after 4 to 5 weeks were well outside acceptable limits.

Very few salts were added to the propagation mix, and the question arose as to the origin of the saline condition of the mix. The answer was obvious of course—the salinity was being increased by the continual watering, and the high evaporation of water from the heated benches.

This situation had existed for years though, without experiencing these troubles, so what was new? The answer turned out to be double-barrelled.

In the past the mains water in Adelaide had always been hard, but this hardness was brought about by high amounts of magnesium and calcium carbonates. Most kinds of plants were fairly tolerant of these materials and even put up with the added fluoride, as well as the large amounts of chlorine introduced from time to time.

But now we were experiencing a drought, and a large proportion of the city's water was being pumped from the Murray River, and with this water came loads of sodium chloride.

At about the same time the Engineering and Water Supply Department began filtering the water being supplied to our area. This involved floculating the suspended clay from the Murray River water. Alum was added to cause the clay particles to congregate and be filtered out. Lime was then added to restore the pH to more or less neutral.

One solution to our problem was to switch to rain water collected from the sheds and glasshouses. Another catch—what happens when it does not rain? There was really only one answer—to buy a de-salinator.

We did this, and with a pressure attached pump, we now have de-salinated water distributed to the propagating areas. The salinity of the water was reduced from 700 ppm (which included 250 ppm sodium chloride) to about 200 ppm, with an almost total elimination of sodium chloride.

The de-salinated water costs about five times that of normal mains water, but we can now germinate most seeds easily, put roots on *Lamium* with the old weed-like ease, and we even have success with some of the more difficult lines.

It may be asked why other nurseries did not have similar difficulties? Some did, but others were not as dependent on heated

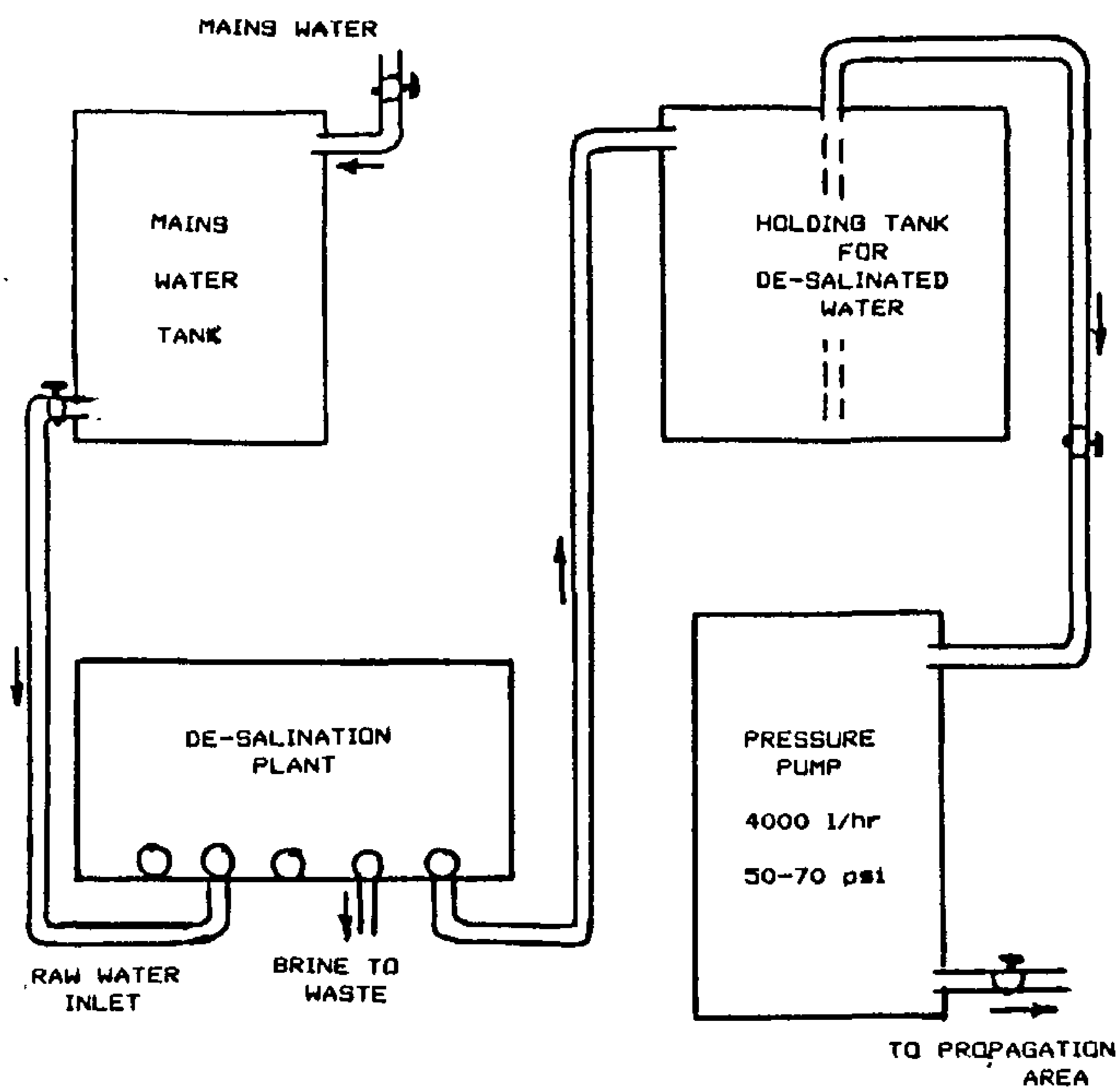

Figure 1. Schematic representation of de-salination system.

benches as we were. Others, like bedding plant growers, and some who were propagating with fast-germinating native seeds, were able to avoid the accumulation of salts in their propagation trays.

We still water our tubed plants with normal mains water—the problem was in the propagation area.

Figure 1 gives details of the de-salination plant.

LITERATURE CITED

1. Hartmann, H. T. and D. E. Kester. 1983. Plant Propagation: Principles and Practices, 4th ed. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.

HYGIENE AND THE USE OF TISSUE CULTURES IN THE NURSERY INDUSTRY

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I would briefly like to examine the importance of hygiene in the preparation of stock plants for tissue culture and in the planting out of tissue cultures. These are the two areas where the nursery propagator and the tissue culture laboratory interact, and for the relationship to be effective and trouble free there must be communication and understanding between the two spheres of activity. I think these two areas are worth exploring at an I.P.P.S. meeting.

Research is expanding the range of products which can be produced by commercial laboratories and tissue culture is going to become a more routine feature of propagation. Therefore theorists and practioners from both areas urgently need to come to grips with each other's requirements.

A combination of higher capital costs, higher labour costs, rising taxes and on-costs must cause the nurseryman to examine his/her nursery turnover in terms of dollars per square metre of floor space. The true cost of producing cuttings should include a calculation of the worth of the floor space occupied by the stock plants in terms of what that space could generate if turned over to straight production. In the not too distant future floorspace may become so valuable that the only stock plants you can afford to hold are those expensive lines which cannot be satisfactorily produced by tissue culture.

Obviously there are a number of equally important aspects of stock plant preparation and planting out which could be examined