In this issue

How much water does a tree drink?

The futuristic Hollywood movie 'Water World' depicts a state of world where due to melting of ice caps, our earth is over-inundated with water and the dearest thing on earth for which humankind fights is not gold but soil mined from under water. Fortunately or unfortunately, such a scenario, if it arrives at all, is very far ahead and ahead enough that we need not worry now. On the contrary, among the major resources, what is immediately valued, after the liquid gold, is not soil but water. Our water tables are dipping, water sources are dwindling and despite two thirds of world being covered with water there are scary predictions that water scarcity might catalyse the escalation of inter-human conflicts. (Are we not already witnessing them between our states and with our neighbouring countries?)

Obviously the concern has been about the type of trees we are planting in our living habitats. What if a tree planted in an area consumes more water than the rains received there? We are probably in for a negative balance of the water and we are eating away our future resources. This exactly was the issue that dragged Eucalyptus into the controversy as a 'tree that depletes our water tables'. The sorry state is that we do not yet have an unanimous account of the water budgets for Eucalyptus; for that matter we do not have such accounts for almost all trees around us. And Eucalyptus was probably singularly pointed at.

To avoid these confusions we need to know how much water a tree transpires in a day, in a year and in its lifetime. As usual, simpler the question, the more difficult it is to answer. Anil Graves from Auroville and Pedro Berlinner and Israel Gev from Israel have attempted to analyse exactly this in their paper (**page 196**) in this issue. Following the observations that the water table in and around Auroville is falling down and that spuriously or otherwise this is coinciding with the planting of trees at the Ashram, the investigators were prompted to prepare a balance sheet of water use by the two most dominant trees planted here, viz. *Acacia auriculiformis* and *Peltophorum pterocarpum*.

The most significant contribution of their work, besides computing the water use by the trees, is the use of a non-destructive method of estimating the rate of sap flow through the plant. They did this by giving a heat pulse across the stem at a point and measuring the rate of diffusion of this heat through the sap as it moves through the stem. Since the heat is transported by convection slowly through the sap, the temperature sensing terminal, thermistor, kept at 15 mm above the source of the heat pulse starts registering a gradual rise in temperature with time and once the 'heat wave' passes the thermistor, it starts recording a fall in temperature. The time taken for maximum temperature to be recorded by the thermistor offers an indication of the velocity of sap flow. By suitable calibrations, Anil Grave's group measured the rate of water flow and from thence the total amount of water moved in a given time.

Accordingly they estimated that in a typical day during April, about 110 liters of water flows in *P. pterocarpum* and about 14 liters in *A. auriculiformis*. Extending the computations further and with certain appropriate assumptions, they estimate that the two species show a sap flux of 8150 and 2350 liters per tree respectively in an year. This accounts for about 13% of the rainfall received in the area occupied by the trees which might go up to about 30% if other losses are included. Thus the predominant trees of the Ashram do not appear detrimental for the water table of the area. Independent of the validity of these conclusions their study suggests a way of developing a balance sheet for the water use for trees, an issue that is bothering a lot many crop physiologists.

K. N. Ganeshaiah

Dental composite

The Council of Scientific and Industrial Research of the United Kingdom published in 1980 the results of an extensive survey conducted by it on the worldwide consumption of biomaterials and biomedical devices. Surprisingly, more than 37% of the total expenditure on medical materials and devices was on dental materials. The Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram conducted a nation-wide survey of the consumption of biomaterials and devices in India in 1985. Interestingly it was found that 35% of the country's total outlay in the biomedical area went into dental materials and devices, very close to the global average.

The sad fact is that even now most of this demand is met by very expensive imports even for run-of-the-mill materials like stainless steel strips, and zinc phosphate cements.

There is a vague feeling that the Chitra Institute is interested in cardiac and neuro problems only. In fact the Institute has done considerable work in the area of dental care. Products such as dental bands, cements, and fillers have been developed by it over the years.

In this issue, V. Kalliyana Krishnan and V. Yamuna describe (**page 192**) the latest development on light cured radio-opaque composite fillers. UV cured fillers have been around for quite some time. But UV cured systems, especially with the mouth so close to the eyes, pose a potential hazard. Light cured composites are relatively new even abroad.

It is encouraging that this expensive and sophisticated material imported till now can be indigenously produced.

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