

The Value of a Tree

How much do YOU think a tree is worth?? And how does one measure the value and then convert the result to monetary terms? Here's one way.....

When Sue Rostas, Communications Officer for the Kooragang Wetland Rehabilitation Project, received a letter from Carrington Public school student, Michael Wilson, it set her thinking.

Michael asked what was the economic value of a tree. He suggested we assume a value of \$1 a day for the amount of oxygen that a tree produces. A tree thus produces \$365 worth of oxygen per year or a total of \$36,500 over 100 years (and that's not allowing for inflation!)

Sue wondered how close to the mark was this assumed dollar value. A few phone calls to Assoc. Prof. Tina Offler, University of Newcastle, and Bill Nethery, State Forests of NSW, plus some library work revealed some startling but often overlooked facts about the true value of trees.



The river red gum, [*Eucalyptus camaldulensis*](#) at Menindee Lakes.

How much is it worth?

Select the thumbnail image or plant name for a higher resolution image (57k).

Michael's assumption had in fact greatly underestimated the value of trees. The true value (considering only oxygen output) of a tree such as a Red Cedar would be about \$120,000 each year (see box below). If the tree lived 50 years, it would have produced about \$6 million worth of oxygen!!

The world would indeed be in deep economic trouble if we had to pay for the oxygen a tree produces.

This calculation of the value of a tree has been based solely on its net oxygen output. But trees also have economic value in a number of other ways:

- They reduce the water table level and hence reduce soil salinity, which in turn improves the soil's ability to grow plants.
- They act as a carbon sink, using up considerable quantities of carbon dioxide, thus reducing the level of greenhouse gases in the atmosphere.
- Oh, and by the way, they produce a valuable building material - timber.

A 50-year-old Red Cedar would yield about \$5000 worth of timber - this is the only factor usually considered when determining the economic value of a tree. As you can see, this pales into insignificance compared to the value of the oxygen the tree gives us free of charge !

Commercial cost of oxygen

7.9 litres (9.0 kg) of oxygen costs \$54.

From this we can calculate that 5 mole oxygen costs \$1.

Value of net oxygen output of a tree such as red cedar

- Trees produce approx 5 mole (a measure of the number of molecules) oxygen per square metre leaf area per day.
- Trees use about half this oxygen for their own respiration. Therefore, the net oxygen output of a tree is approx 2.5 mole per square metre leaf area per day.
- For tropical rainforest the average total leaf surface area is about 8 times the area of the canopy.
- A 5 year old red cedar has a canopy of about 7 square metres and hence a net oxygen output of $2.5 \times 8 \times 7 = 140$ moles worth \$28 per day (about \$10,000 per year).
- A 20 year old red cedar has a canopy of about 80 square metres and hence a net oxygen output of $2.5 \times 8 \times 80 = 1600$ moles worth \$320 per day (about \$120,000 per year).
- By the time the tree is 50 years old it would have produced oxygen worth about \$6 million!

NB The above calculation is a rough estimate assuming 10 hours of sunlight per day and "typical" levels of water, light, temperature and nutrients.

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