


## TREES FOR A FUTURE

Trees can contribute to a solution for many of the problems that challenge humankind: how to meet the needs of an exploding population from the resources of a finite planet; how to maintain water supplies, check floods, droughts, soil erosion and desertification; how to reverse global warming.

### TREES FOR FOOD

Carefully selected species could be grown in most habitable areas to yield more food per hectare than cereals or livestock.

| CROP                | YIELD<br>(Tonnes per hectare.) | NUTRIENTS (Grams per 100 grams) |       |                |  |
|---------------------|--------------------------------|---------------------------------|-------|----------------|---|
|                     |                                | Protein                         | Fat   | Carbo-hydrates |   |
| Hazel               | 4.0                            | 12.6                            | 62.4  | 16.7           | Can be grown on uplands instead of sheep.   |
| Walnuts             | 31.0                           | 10.6<br>(dried)                 | 51.5  | 5.0            |   |
| Dates               | 13.0                           | 2.0                             | Trace | 63.9           | Desert areas.   |
| Carob seed          | 47.0                           | 4.8                             | 0.3   | 85.3           | Famine food.<br>Nitrogen fixing bacteria in roots.                                  |
| African locust bean | 31.0                           | 26.0                            | 10.0  | 47.0           |   |
| Olive               | 9.0                            | 0.9                             | 11.0  | Trace          | Olive trees used to reclaim the desert.   |
| <b>COMPARISONS:</b> |                                |                                 |       |                |   |
| Cereals             | 5.0                            | 10.0                            | 2.0   | 70.0           |   |
| Meat                | 0.2                            | 18.0                            | 17.0  |                |   |

Almond, walnut and sweet chestnut can yield in southern UK; pine, oak, hazel, beech, apple and other species with juicy fruit throughout the country. Oaks and hazels should be restored to the Welsh hillsides in place of the sheep that cause erosion. Trees are perennial, so the regular ploughing, often with heavy machinery, that damages soil structure is obviated. Their leaves, when dropped, add to the soil humus and the minerals and trace elements brought up by the deep searching roots. Other crops can be grown between them to yield food while the

trees are maturing. Some trees have edible leaves from which nutrients can be extracted by means of simple machines now available. Much vital research must be done.



### TREES FOR MANY OTHER PRODUCTS

Trees provide timber for many construction products, for furniture and innumerable other articles, fibre and pulp for paper, textiles (e.g. rayon), and synthetics of many kinds, resins, dyes, drugs, etc.

### TREES - THE ALTERNATIVE ENERGY SOURCE

Fuel wood is the energy source of most of the world's people. With careful planting and nurture of appropriate species, it can be an indefinitely renewable source. Stoves designed for maximum economy and minimum pollution are now available. Wood can be used to yield gas, electricity and liquid fuel, both simply and locally and in large units. This can be waste wood from trees felled for other purposes or grown specially and coppiced.

Other sources of energy - wind, tide, geothermal, hydro, direct sunlight, other forms of biomass - all have their advantages and disadvantages, but none have the multiple uses and environmentally beneficial functions of trees.

Wind farms in barren, exposed, isolated areas can be welcomed as making a valuable contribution to the national grid. Windmills can be used as local power sources, as they were in the pre-industrial age. However, who would wish to see large areas of the countryside given over to wind farms? There is such a factor as visual pollution: pylons are unsightly enough. Noise from wind farms can be a nuisance. Moreover, windmills have but one function: trees have many that are vitally important for environmental health. Let's give land and research to trees.

### TREES, WATER, SOIL EROSION, AIR QUALITY

Trees regulate water supply, keeping it available for their own needs and for those of other plants, for humans and other animals. The roots of the great forest trees penetrate deeply into the earth and draw up great quantities of water which pass through the trees and out through the leaves to create "oceans of the air". Thus the water is kept available for rain. Trees may deprive plants grown immediately beneath but help those at a distance. Forest height and the cooling effect of the water transpired by the leaves can promote rain in the same way as mountain ranges that force the rain clouds to rise and cool. Paul Schreiber, the meteorologist, estimated that a region covered with forest increased rainfall to the same degree as elevating it 350ft.

When rain falls on forest canopies, its force is broken by the leaves and branches so that it seeps gently through the forest debris to replenish the water tables below. Sinking wells where there are no tree belts in the area to maintain water tables can be a dangerous living off capital. Water running off of bared hillsides carries away the soil, not only depriving the uplands but also silting up dams and reservoirs and causing rivers to flood.

In other areas, wind is the chief agent of soil erosion. Once the protective cover of trees is gone, particles of soil blow away. Anything which damages soil structure, such as artificial fertilisers, constant ploughing for arable crops, the hooves of grazing animals, accelerates soil erosion. It is increasing to an alarming degree in many areas of the world. When the forests go, the deserts come. Growing the right trees in the right way can check deserts and reclaim them.

## TREES AND GLOBAL WARMING

It is now generally agreed (see reports of the Intergovernmental Panel on Climate Change) that certain gases are building up in the air and trapping the heat formed from the sun's radiant energy, so as to cause global warming. Experts vary in detail as to the consequences in different areas, but nearly all agree that urgent action is necessary to check major climatic changes that could have serious effects on agricultural production and human habitations.

It is estimated that CO<sub>2</sub> released by the burning of fossil fuels and wood (some of it in the forests being destroyed worldwide) is responsible for about half of global warming danger. Scientists are now addressing the question of how to check, perhaps reverse, the process. All green plants take in CO<sub>2</sub>, use the carbon for energy and to build up their bodies, and give out the oxygen required for respiration. While plankton of the oceans absorb an estimated half of the CO<sub>2</sub> given out, trees because of their size and longevity play a very important role. While they live and while their wood is used for long lasting products and projects, large amounts of carbon are kept out of the atmosphere. When they are burned or decay, they add no more than they originally took in. Forest units, if large enough, and if young trees are planted as soon as mature ones are felled, are permanent sinks of carbon. Scientists are working out the acreages of forests necessary to effectively check global warming.

According to an article in the *"New Scientist"* of 17.8.1988, Gregg Marland of the Oak Ridge National Laboratory in the US "argued that proper management of the plantations in temperate and tropical zones, together with the doubling of all existing forests, could return all the CO<sub>2</sub> released from factories and power stations since the Industrial Revolution back into the biosphere (i.e. life forms) in about 35 years". Later he estimated that 7 million square kilometres could absorb current emissions of CO<sub>2</sub> from the use of fossil fuels. His ideas are now being implemented - but not nearly energetically enough.

If forests are to be established to check, even reverse, global warming and to meet the needs of the increasing world population, the area required will be enormous, **BUT PROBABLY NOT GREATER** than that already cleared through the millennia for grazing animals. It could be made available if livestock farming were phased out. Of the earth's 130 million square kilometres, 41 million are forest and 31 million are pasture for animals bred unnecessarily for food. Such animals are given a large proportion of the crops grown on the 15 million square kilometres of cropland. Animals yield no benefits that cannot be got more economically direct from plants, **NOT EVEN FERTILISER**. They compete with humans for land, water, plant foods and other vital resources. They breathe out CO<sub>2</sub>, and cattle and other ruminants belch out large amounts of methane from the bacteria in their extra stomach that enables them to digest fibrous foods indigestible to humans.

"Methane is 20 - 30 times more effective than CO<sub>2</sub> in trapping heat... Within 50 years it may be the most significant greenhouse gas." (*World Resources, 1990 - 1991, by World Resources Institute in collaboration with UN Dev. & UN En. Programmes, p23*). Livestock are the chief

anthropogenic source of methane (*ibid.* p346). Methane may be accelerating ozone layer depletion.

The above facts make a convincing case for phasing out animal farming and giving the land released to forests - convincing, that is, to those not locked in the age old belief that animal products are necessary for human health. Over fifty years ago a group of people, motivated by compassion for cruelly exploited animals, stepped out of that prison and established a vegan diet. Now the obvious good health of vegans of all ages and the results of extensive scientific research has taken all plea of necessity from animal farming.

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***RECOMMENDED READING:***

*"Abundant Living in the Coming Age of the Tree" - Movement for Compassionate Living publication with full reference (see Publications page of MCL website).*

*"The Coming Age of Wood" - Egon Glesinger (from libraries only).*

*"Trees - A Perennial Agriculture" - Russell Smith.*

*"Forest Farming" - Sholto Douglas & Robert Hart.*

*"Sahara Conquest" - Richard St Barbe Baker.*

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