

Agroforestry may halt the march of the deserts

Less than 25 per cent of the earth's land surface is "potentially arable", and only 44 per cent of that is now under cultivation. The developing countries, for their part, must feed 71 per cent of the world's population on 64 per cent of that land. By the year 2000, the United Nations estimates that their population will have increased from 2.5 billion to more than 5 billion. "At the end of this century, the developing nations, even if they are able to afford to utilize all the best land in their countries, will have to support a larger proportion of the world's population than they now fail to do." These were the words of Dr. Kenneth King, Director-General of the International Council for Research in Agroforestry (ICRAF), at a seminar on "Challenge for Change in Third World Agriculture", co-sponsored by the Ottawa-based International Development Research Centre (IDRC) and the Alberta Institute of Agrologists, in Edmonton, in late September.

There is much land that cannot be farmed in the conventional sense without drastic and often irreversible degradation, but which must support significant numbers of people, now and in the foreseeable future. If too dry, rocky or steep to be called arable, this land, can, however,

support trees, alone, or in combination with agricultural crops and animals — a method that is called agroforestry.

Agroforestry has been defined as "a sustainable land-management system that increases the yield of the land, combines the production of crops (including tree crops), forest plants and animals, simultaneously or sequentially, on the same unit of land, and applies management practices that are compatible with the cultural practices of the local population". And, stresses Dr. King, agroforestry can be practised on soils that are inherently infertile, or prone to accelerated erosion or compaction, or where climatic conditions are too extreme for "normal" plant growth, or where a combination of these factors makes the areas unsuitable for conventional agriculture.

The tree is the key

The key to agroforestry is the tree. Many species can in fact be grown on poor soils because while they absorb the nutrients from the soil, they convert them into plant materials, then release them back into the soil through the decomposition of their leaves, branches, etc. In addition, the foliage protects the land around the tree from the impact of rain, thus minimizing soil compaction. The humus layer



IDRC scientists and farmers are experimenting with traditional crops that can be grown with trees in the shifting cultivation practised in the humid tropics. In Nigeria, yams can be planted with *Gmelina arborea* trees and other species. The farmers not only benefit from the food produced, but every nine to ten years they have a tree crop to harvest as well, giving them wood for fuel and building material.

they provide helps prevent run-off and thus ensures that the water percolates to the ground. They also serve as shelterbelts against desiccating winds and blowing sand, preventing soil erosion and protecting nearby plants.

IDRC role

In the Kerma Basin in Northern Sudan, for example, attempts are being made to reclaim land from the Nubian Desert by planting *prosopis chilensis* and eucalyptus as windbreaks. It is hoped that this once fertile area can again be planted to grain and vegetable crops. Similarly in Egypt, IDRC is funding research to breed an improved type of *casuarina* for shelterbelts. And in Kenya, where many plantations were established in areas of high rainfall and are now being felled for farmland, foresters are trying to discover which species will grow best on marginal lands.

By using fast-growing trees, such as the *leucaena* that reaches maturity in only six years, an important wood crop could be



Mustapha, a farmer in the Nile delta, ploughs his fields protected by rows of *casuarina* trees. Behind, to the West, the Sahara desert encroaches. Shelterbelts and irrigation can restore much of the land bordering the deserts.