

WORLDWIDE LOSS OF SOIL AND A POSSIBLE SOLUTION

Reports during the 1970s indicated that large-scale agricultural techniques in the United States were depleting the soil about 8 times faster than they were being created naturally. In 1994, the United States Department of Agriculture reported that approximately 12,000 pounds of soil were being lost per acre per year (13,300 kg of soil were being lost per hectare per year) from wind and water erosion of U.S. land farmed with large-scale techniques.¹ According to soil conservation specialists in Iowa, approximately 16,000 pounds of soil per acre per year (17,800 kg of soil per hectare per year) were being lost earlier due to wind and water erosion at the time when soil conservation practices were instituted in the 1970s.²

Since the average person consumes approximately 2,000 pounds (900 kg) of food annually, the above data can be developed to show that approximately 8 pounds (3.6 kg) of soil were previously lost due to wind and water erosion for each pound of food eaten. Currently, approximately 6 pounds (2.7 kg) of soil are being lost due to wind and water erosion per pound of food eaten annually.

In addition, in the late 1970s, the California government issued statistics indicating that in California it was taking *as much as* 2,000 years for nature to build up 1 inch (2.5 cm) of soil, and that California large-scale agriculture was depleting *as much as* 1 inch (2.5 cm) of topsoil every 25 years. As a result, California agriculture was depleting the soil *as much as* 80 times faster than it was being created in nature.

Normally it takes an average of 500 years for nature to build up 1 inch (2.5 cm) of topsoil. To grow good crops agriculturally, 6 inches (15 cm) of topsoil are required. Therefore, approximately 3,000 years are needed to build up a reasonable agricultural soil. In contrast, the 12,000 pounds per acre (13,300 kg per hectare) of soil being lost in the U.S. *on the average* annually is 0.0356 inch (approximately 1/28th of an inch) of soil over 1 acre (0.904 cm of soil over one hectare). Since only 1/500th of an inch (0.00508 cm) of topsoil is being built up naturally *on the average* annually in the U.S., soil is being depleted on the average each year approximately 18 times faster than it is being built up in nature.³

In contrast, a Master's thesis⁴ at the University of California–Berkeley in 1983 indicated that Biointensive practices, over an eight-year period (as performed by Ecology Action on Syntex Corporation land at the Stanford University Industrial Park), built up the humified carbon level in the upper 1 to 1.5 inches (2.5 to 4 cm) of the soil, which began as only 'C'-horizon subsoil, to a level that would have taken nature alone 500 years to accomplish. Therefore, this thesis indicated that Biointensive techniques have the potential to build soil up to 60 times faster than it can be developed by nature alone.

In addition, preliminary indications from research performed by Dr. Ed Glenn at the Environmental Research Laboratory at the University of Arizona are that high yields and reduced resource consumption may be possible with Biointensive agriculture on a sustainable basis. Additional testing will be needed for a final evaluation, but in comparison with other agricultural practices generally being used, Biointensive techniques offer hope for the depleted world soil situation.

¹ Exact figure is 11,572 pounds per acre (12,970 kg per hectare), from: *Summary Report 1992 National Resources Inventory* (Soil Conservation Service, U.S. Department of Agriculture, Washington, DC, 1994).

² Worldwide soil erosion rates are highest in Asia, Africa and South America, averaging approximately 13 metric tons (exact figure: 26,768 pounds) to 17.5 metric tons (exact figure: 35,637 pounds) per acre per year. From: C. J. Barrow, *Land Degradation* (Cambridge University Press, Cambridge, 1991).

³ Based on the statistics given in Footnote 2, in developing nations, soil appears to be being depleted up to approximately 36 times faster than it is being built up in nature; and, in China, 54 times faster than it is being built up in nature.

⁴ Douglas Edward Maher, *Changes in Carbon Content in a Soil under Intense Cultivation with Organic Amendments* (University of California–Berkeley, 1983).