

- Roots give off certain biochemical compounds called **exudates**, which sometimes act as **phytotoxins**, chemical inhibitors of competing plant species—a process called **allelopathy**. Winter rye, for example, gives off exudates that suppress couchgrass growth.
- The dead tissue continually sloughed off by growing roots is excellent food for microorganisms. The organic contribution of the root portion of a green manure crop often is more substantial than the part you see above the surface.
- Plant roots are able to take up many complex organic compounds such as hormones, vitamins, antibiotics, and humus fractions, as well as toxic substances like pesticides and herbicides. This is an important counter to the argument that the source of plant nutrients—whether chemical fertilizers or compost—is irrelevant to plant health.

Soil and Civilization

All land-dwelling animals, including humans, are members of the soil community. Human societies disregard this fact at their own peril: soil fertility has historically been squandered for the immediate enrichment of a few at the expense of future generations. Cultural values—ethics, aesthetics, and spiritual beliefs—have a profound influence on how soil is treated.

Not only the farm itself, but also the society of which it is a part must be viewed as components of the soil ecosystem, for all support and maintain one another and none can exist independently. Without a good-sized nonfarm community nearby, for example, marketing becomes a problem for the farmer; yet too large a nonfarm community exerts pressure to convert productive farmland to other uses. A whole book could be written about the effects of political and economic pressures on soil fertility—especially in the “Third World,” where peasants are forced to produce export crops for foreign exchange instead of food for their families.

The 1992 United Nations Earth Summit acknowledged the importance of sustainable agriculture as a means of reversing worldwide environmental degradation. Implementing its recommendations will require widespread public consciousness-raising. Political and social activism are, more clearly than ever, essential components of soil stewardship.