Soil biology is rapidly emerging as one of the glamor fields of the 1990s. Our improved understanding of the complex webs of soil microorganisms and the conditions that moderate their ecological function is likely to inform much of agricultural management into the next century. For those scientists whose reading frontiers may not often extend beyond U.S. borders, Soil Ecology is a current look at this exciting research area in Europe and elsewhere in the world. Editors Brussaard and Ferrara-Cerrato bring together reports from authors working in Netherlands, Chile, France, New Zealand, Indonesia, Mexico, and several countries of Africa. Beyond the usual taxonomy of soil organisms, several chapters explore the ecological functioning of soil biota and how this relates to system management. Therein we find the value of this review.

A long-term comparison of conventional versus integrated management in Netherlands (Chapter 1) revealed higher earthworm numbers, greater porosity, less compaction, and higher water content in the latter system, although there was no difference in number of "workable days in the field" nor crop yields. In Chapter 2 the authors found the expected greater pore space and increased carbon mineralization in clay soils compared to loams or sands, and also that organic carbon and microorganisms are protected by the clay fraction even in sandy soils. There are different rates of bacterial grazing by nematodes among soil types, for example, and available carbon—not soil structure or texture—dictates the total activity of soil microbes.

Chapter 3 reports New Zealand experience with alternative tillage systems and their impact on balance of soil organism populations. Bacteria have higher turnover rate, while fungi with their mycelial growth are more conservative of energy and nutrients, and thus function better in storing soil organic matter. No-till favors fungal-based food webs, while conventional tillage favors small organism size, faster turnover, rapid dispersal, and generalist feeding—all characteristics of soil bacteria. There are also higher earthworm numbers in no-till. When better understood, these mechanisms should influence tillage management, factors that we have not considered except as we observe their gross impact on observable soil structure and ease of tillage.

Roots are both sinks and sources of carbon and nutrients, according to mechanisms described in Chapter 4. They are mainly sinks during crop growth, and sources for succeeding crops, although the interactions with the soil solution are more complex than this. Roots are a carbon source through respiration, exudates, insoluble compounds and structural carbon after root death. How these processes can be managed to make carbon and nutrients available at appropriate times of crop development is a complex question, but one that is essential to use a "response farming" strategy that allows changes in management due to rainfall and other events during the crop cycle. Chapter 5 explores mycorrhizal interactions in different intercropping systems in Mexico. Species-complex cropping systems and application of manure appear to have higher levels of mycorrhiza, as do home gardens that are often collections of many vegetable species. Pesticides are shown to reduce mycorrhiza.

Two concluding chapters describe what is known about soil biology in Africa. Earthworm impact on system performance depends on species present, types of cover, and crop mixture; there are more than 28 genera of earthworms in West Africa, with distribution highly dependent on season (Chapter 6). Earthworms may produce from 25 to more than 300 tons of surface castings per hectare each year, depending on conditions and soil type. Greater amounts of castings, thus increased nutrient cycling is found in permanent systems, in alley cropping, and with use of green manures—all factors that increase crop yields.

Biological management of fertility is described as increasing the potential efficiency of inorganic inputs in Chapter 7 from Kenya. Author Mike Swift reports that advances from the typical high-input, green revolution technology cannot be sustained indefinitely due to other constraints on productivity. He describes how soil organisms function to synthesize and decompose soil organic matter, and how burrowing critters influence soil structure and water regimes. Most useful is a table relating management options to soil biological activity, and how tillage, pesticides, and long-term practices influence the soil organic matter. Swift’s long experience in Zimbabwe and elsewhere in East Africa lend credibility to his conclusions.

For most of us who still imagine the soil biological complex as a vitally important but poorly understood segment of the total cropping system, this book is a useful introduction to current work on soil biology. Several of the chapters could best be characterized as narrow research reports on specific experiments. Others provide a good overview and synthesis of the literature. Overall, Soil Ecology in Sustainable Agricultural Systems is a well balanced presentation of recent data that can be used as a reference for graduate courses in soil microbiology, agroecology, or soil fertility management. As with most edited volumes, it would be less useful as a course text. The access to European authors and other reports from Africa and elsewhere add to the value of the book.

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The title of John Perkins’ book, Geopolitics and the Green Revolution, properly indicates its emphasis on political aspects of agricultural change, but not the wealth of historical material he has assembled on its scientific background. Like his earlier book, Insects, Experts and the Insecticide Crisis (1982), it presents the historical and philosophical background relevant to public debate about the impact of scientific research. The subtitle Wheat, Genes and the Cold War highlights its focus on wheat improvement and what he calls “political ecology”.

The book begins with an excellent preface outlining the need for greater public understanding of this century’s “yield transformation” of the staple cereals, given “the immense importance of agriculture in general and of the cereal crops in particular to the shape of human culture and the security of nations”. I was surprised, therefore, by his statement that the co-evolution and co-dependency of humans and wheat emerged as “an originally unanticipated theme”, which becomes the subject of the first chapter, entitled “Political ecology and the yield transformation”. The reader may not emerge with a clear concept of what political ecology is, yet agree with his proposition that “lack of historical insight is particularly troublesome in critiques of current agricultural practices as environmentally destructive and socially inequitable”, as well as with his observation that the word “development” has be-