A Plea to Reform Soil Science Education

JAN W. HOPMANS*
Dep. of Land, Air and Water Resources
Univ. of California
One Shields Ave.
Davis, CA 95616

These past few years the debate about soil science’s future in education and research has been challenging. This is certainly not new, as documented in recent articles by Philippe Baveye and his colleagues (Baveye, 2006; Baveye et al., 2006), and in a booklet published by the International Union of Soil Sciences (IUSS, 2006), offering perspectives of 55 soil scientists around the world. This letter summarizes my own perspectives on the future of soil science, though I hasten to note that my comments were sharpened by constructive input from faculty colleagues at University of California—Davis, and I believe that many may be shared by others.

The soil science discipline historically developed from the need to change and adopt land uses for agricultural crop production, so as to increase food supplies on a regional, national, or global scale. This brought about the traditional subdisciplines of soil physics, chemistry, fertility and plant nutrition, microbiology, pedology, mineralogy, and areas of soil management and conservation that still remain today. Soil science as a discipline was and is still intimately tied with agronomy, irrigation, and crop science, to provide a forum for expert soil science input in development and management of increasingly effective and efficient crop production systems. This connection proved crucial in the green revolution, as soil science contributed significantly to the productivity gains that were achieved, in addition to plant breeding (Hartemink, 2002). In the past few decades, within industrialized countries, the focus has shifted increasingly from agricultural to environmental applications, and this has brought new soil science divisions with emphasis on management of land and water resources, water quality, and soil conservation, in part to ensure the sustainability of agricultural practices. Despite the fact that genetic yield potentials are being approached in developed countries, soil science education will remain essential in the future, to provide for global food security, and to feed increasing populations of many of the least-developed and developing countries. History leaves no doubt that soils and society are intimately linked.

As our society has become increasingly urban and environment conscious, so also have the priorities of college-bound students with their interests moving from agricultural to engineering or away from natural sciences altogether. Graduation numbers in soil science majors and graduate programs have dropped, nationally and globally. This trend jeopardizes the ability of new soil science faculty in many universities to develop strong soil science curricula. In parallel, funding for soil and water science has been drawn toward other environmental disciplines such as civil engineering and civil engineering. The combined effect has been a loss of funding available for soil scientists, as competition steadily increased with the rise of other environmental science programs, many of which lack funding available for soil scientists, as competition steadily increased with the rise of other environmental science programs, many of which lack soil science component, and thus new soil science faculty in many universities that traditionally offered soil science education and research has been challenged. This is certainly not new, as documented in recent articles by Philippe Baveye and his colleagues (Baveye, 2006; Baveye et al., 2006), and in a booklet published by the International Union of Soil Sciences (IUSS, 2006), offering perspectives of 55 soil scientists around the world. This letter summarizes my own perspectives on the future of soil science, though I hasten to note that my comments were sharpened by constructive input from faculty colleagues at University of California—Davis, and I believe that many may be shared by others.

The soil science discipline historically developed from the need to change and adopt land uses for agricultural crop production, so as to increase food supplies on a regional, national, or global scale. This brought about the traditional subdisciplines of soil physics, chemistry, fertility and plant nutrition, microbiology, pedology, mineralogy, and areas of soil management and conservation that still remain today. Soil science as a discipline was and is still intimately tied with agronomy, irrigation, and crop science, to provide a forum for expert soil science input in development and management of increasingly effective and efficient crop production systems. This connection proved crucial in the green revolution, as soil science contributed significantly to the productivity gains that were achieved, in addition to plant breeding (Hartemink, 2002). In the past few decades, within industrialized countries, the focus has shifted increasingly from agricultural to environmental applications, and this has brought new soil science divisions with emphasis on management of land and water resources, water quality, and soil conservation, in part to ensure the sustainability of agricultural practices. Despite the fact that genetic yield potentials are being approached in developed countries, soil science education will remain essential in the future, to provide for global food security, and to feed increasing populations of many of the least-developed and developing countries. History leaves no doubt that soils and society are intimately linked.