IPNI
Plant Nutrition TODAY
Better Crops, Better Environment...through Science

From Scientific Staff of the
International Plant Nutrition Institute (IPNI)
3500 Parkway Lane, Suite 550
Norcross, Georgia 30092-2806 USA

Phone: 770-447-0335 Fax: 770-448-0439
E-mail: info@ipni.net Website: www.ipni.net

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PLANT NUTRITION STEWARDSHIP: SCIENCE AND ETHICS

Stewardship involves both science and ethics. A recent Bouyoucos Conference sponsored a small group of scientists and philosophers to meet in Nebraska to discuss the topic "Soil Stewardship in an Era of Climate Change." They focused their discussion on three areas: ethics, sustainability, and communication. The goal was to integrate these areas to come up with practical advice for applying science to soils.

Scientists are often uncomfortable talking about ethics. Ethics depend more directly on beliefs and values than on the observable facts, testable hypotheses, and logical conclusions that form the mainstay of science. Nevertheless, this group agreed that the choice for science as a career is often ethically motivated, and that ethics play a role in both the conduct and application of science.

An ethic is a belief about the value something holds and proper conduct towards it. Ethical arguments are normative—dealing with what ought to be—but include rational and logical premises as well. Facts and causal relationships do not determine what ought to be, but we need to know them in order to specify ethical behavior, guidelines, and goals.

Sustainability is an example of an ethical goal. It can be motivated by concern for future generations, or by beliefs about the value of the natural environment. Soil faces sustainability challenges, including erosion and other forms of degradation, not just from existing practices but also from future changes in climate.

The four "rights" of plant nutrition stewardship also have an ethical component. There is a moral value judgment when choosing the right nutrient source, metering out the right rate at the right time and in the right place. The value judgment is based on how this combination of actions meets sustainability goals. These goals are determined, not by science, but by scientifically informed people who apply their beliefs and values when choosing targets for outcomes. For example, in a setting where a pre-plant application of nitrogen optimizes yield but results in excess groundwater nitrate, a stewardship approach would seek a management strategy (perhaps split-application, perhaps a controlled-release source, perhaps a technology yet to be developed) that both optimizes yield and limits nitrate loss to groundwater. If these benefits are understood and shared by the stakeholders, support for changes in technology should be easier to obtain.

Setting sustainability goals involves science communication. Many scientists feel their work is not adequately understood or appreciated, and is not appropriately used in development of policy, regulation and practical recommendations. Science can help define the right management to achieve particular sustainability goals, but scientists must recognize the ethics, beliefs, and values of their audience to meaningfully engage public dialogue on such goals. Cal DeWitt, Professor, University of Wisconsin, described the situation in this way: "Plant and soil scientists, agronomists and agricultural extension agents—together with farmers, gardeners, and every person on earth—are in a continual, sustained, and interactive relationship with plants and soils." Science not only pulls out the facts and describes cause and effect, but also builds appreciation for the complexity and beauty of ecosystems, both natural and managed.

Can we improve our sustainability ethic? Codes of ethics for professional crop advisers, agronomists, and soil scientists often emphasize ethical behavior in terms of the interest of the client. But they also include the interest of the public, which extends to sustainability and therefore, sustainability ethics. Can we more clearly define a professional ethic for the conservation, renewal and improvement of the resources involved in plant nutrition, including soil, water, air, nutrient supplies, and plant genetics?

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For more information, contact Dr. Tom Bruulsema, Northeast Director, IPNI, 18 Maplewood Drive, Guelph, Ontario N1G 1L8, Canada. Phone: (519) 821-5519. E-mail: Tom.Bruulsema@ipni.net.

Abbreviations: N = nitrogen.

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