

as they look to their future role in food production. They are truly a part of an international industry. They must be low-cost producers to remain competitive, and, at the same time, they must be profitable to stay in business. Profitable farmers will be better able to protect the environment, utilize resources, and produce abundant, safe foods. They will adapt to, adopt, and successfully use the contributions biotechnology will make.

The knowledge farmers use to make the progress necessary to feed tomorrow's world population...and feed them better than they are eating today...will come from new discoveries made from research. A part of that research will involve mineral nutrition and soil fertility. It will include studies on how to best manage soil variability and crop needs so that nutrients, both mineral and organic, can best be utilized.

Earlier, the question was asked, "What can be done to ease the effects of the current economic downturn?" Perhaps that is the wrong question. Rather, we should ask, "How can we make best use of emerging technology and combine it with proven science to continue to feed a growing world population?"

The obvious answer is to grow more yield per unit of land and do it at a higher profit by lowering unit production costs... while improving environmental protection. Building and maintaining high soil fertility...and providing balanced nutrition to the growing crop...will go a long way in making that scenario possible. BC

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High Crop Yields – Closing the Gap

This issue of *Better Crops with Plant Food* contains articles that describe circumstances surrounding record-breaking yields. These yields are summarized in **Table 1**. They clearly illustrate the remarkable attainable yields of today's genetic material and at the same time in striking fashion reveal the huge gap between attainable yields and the yields normally harvested. Narrowing that yield gap is the greatest:

- Profit opportunity available today to crop producers;
- Potential source of food for the additional 2.5 billion people expected on this planet by the middle of the next century;
- Source of environmental relief through enhanced carbon sequestration, increased nutrient use efficiency, and through freeing more land for buffer strips, wetlands, rain forests, and recreation.

TABLE 1. Record crop yields in North America reported in this issue.

Crop	Yield	Location	Year
Alfalfa	24.1 tons/A	Arizona	1982
Barley, spring	190 bu/A	Alberta	1990
Canola, spring	70 bu/A	Alberta	1999
Corn	394 bu/A	Iowa	1999
Cotton	5.4 bales/A	Arizona	1982
Soybean	118 bu/A	New Jersey	1983
Wheat, winter	205 bu/A	British Columbia	1988

So what does it take for an individual to exploit the yield gap? In one word, management...in a phrase, management and long-term dedication. The articles that follow summarize what has worked in some cases and hold insights into the necessary ingredients of a reproducible framework for high yields. However, much is yet to be learned about incorporating the power and efficiencies of today's technologies into a holistic, systems-level approach to crop, soil and water management. In other words, there are some exciting research opportunities waiting for us as we turn the corner to another century of agricultural progress. BC