In Closing: An Opinion

We have attempted in this review to describe in general terms the possible agricultural consequences of the enhanced greenhouse effect. It seems also appropriate to address two specific notions that are often heard.

The first is the simplistic application of the concept of thresholds to the policy arena: namely, the setting of arbitrary levels for atmospheric trace gas concentrations, emission rates, or temperatures to serve as upper limits of acceptability for policy response. The term "threshold" is misleading whenever artificially contrived levels are specified rather than natural thresholds.

Proponents of this approach contend that such levels, if generally agreed upon, can serve as quantitative criteria or guideposts for directing national as well as international efforts to contain potentially harmful consequences of the greenhouse effect. The concept is, in fact, a double-edged sword, since it can be used to either justify or to delay societal action on the issue of global warming. The shadow side of such a policy is the implication, however unintended, that amounts under the specified levels are harmless, and that the consequences of the enhanced greenhouse effect do not become manifest or significant until these artificial levels are exceeded. Misconstrued, this concept can give license to continue "business-as-usual," with no need for societal action until the arbitrary level is about to be exceeded.

A more prudent principle, in our view, is the quite plausible assumption that global warming and its manifestations will be in some manner proportionate to the increase of trace gas concentrations and that the eventual consequences of any significant human alteration of the Earth's energy balance is potentially serious. This principle, were it accepted, would encourage responsible agencies to adopt a policy aimed at reversing current trends rather than implicitly sanctioning the continued enhancement of greenhouse gas emissions until such time as the warming effect becomes clearly evident.

The second notion, which can be equally misleading, is a blind faith in agriculture as a self-correcting process: that through forces of the market and self-preservation farmers can and will readily and fully adapt to climate change as it occurs. They will certainly make every effort to do so, but the efforts of farmers may well be constrained or even thwarted by factors beyond their control.

In the tropics, inadequate agricultural research, training, and credit now limit the capacity of farmers to adapt to climate change. In all areas of the world the necessary adjustments (such as substituting crops, introducing or intensifying irrigation, and modifying field operations such as tillage or pest control) may be too costly for many farmers to implement. Such changes may entail painful social dislocations as well as costly capital investments. Even for those who can afford such changes, the end result--measured in terms of production and income--will not necessarily compensate for the direct costs involved; heat-tolerant and especially drought-tolerant crops or

varieties, for example, will likely have lower yielding potentials. Moreover, natural ecosystems such as forests may be less adaptable than agricultural systems to rapid change and may therefore prove more vulnerable to climate change with respect to such factors as species dieback and biodiversity.

Either of these potentially misleading notions, along with the convenient expectation by some plant scientists that the physiological effects of enhanced CO_2 will be overwhelmingly positive, may lull decision makers and the public at large into complacency regarding global warming and--at the very least--could delay effective action. Global warming is, in our opinion, a real phenomenon that is likely to engender serious consequences.

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For Further Reading

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