Water Conservation and Efficient Use

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On the 200th anniversary of T.R. Malthus’ famous Essay on the Principle of Population, Lloyd Evans (1998), the distinguished plant physiologist, explored the historical relationship between world population growth and food supply. Evans recounted the dire predictions of famous doomsayers and the remarkable technological revolutions in agriculture that have allowed us, at least thus far, to avoid being “checked,” to use the Malthusian euphemism for mass starvation. And yet the world’s population continues to grow, especially in underdeveloped parts of the world, at rates that must disturb even the most buoyant optimist.

During the next several decades, dryland agriculture will play an increasingly important role in our efforts to maintain global food security. This is due to two relatively recent developments. The first is that, until about 1960, most increases in the world’s food supply resulted from increasing the amount of land under production. Since then, most of the increasing demand for food in the world has been met by increasing yields. Additional lands still remain that could be brought into production, but as Evans (1998) pointed out, they tend to be unproductive, environmentally sensitive, remote, or otherwise unsuitable for agriculture. Indeed, many have argued that one of the most important reasons for continued yield increase is the need to protect environmentally sensitive land, including wildlife habitat. Furthermore, in many developed regions, including the USA, existing agricultural lands are gradually being lost due to such processes as erosion, salinization, urbanization (or “suburbanization”), and contamination.

The second, and perhaps more alarming development, is that the world’s supply of fresh water for irrigation is limited and increasingly the object of competition. Irrigated agricultural land, which constitutes less than one-fifth of the