

Hydroponics — Hype And Hope

*John M. Gerber
Department of Horticulture
University of Illinois, Urbana-Champaign*

When Pres. Reagan made a campaign stop at the Archer Daniels Midland Co. greenhouse in central Illinois (Decatur), the science of controlled environment food production received national press coverage. Whether it is a third generation glasshouse operation, a hydroponic greenhouse, or an all-enclosed, hi-tech system, controlled environment food production captures the public's imagination.

It has also attracted entrepreneurs, dreamers, and shysters in recent years, so that comments on these systems today range from unqualified praise to insulting derision. They are rarely evaluated with common sense for their scientific, economic, and horticultural attributes and faults. The term "hydroponic" particularly can elicit discussions, debates, and an occasional shouting match among growers, scientists, and suppliers of these systems. This is unfortunate, as there is nothing inherently good or evil about hydroponics. It is simply a method of feeding and watering plants. It is usually part of a larger system designed to control other aspects of the plant's environment such as temperature and sunlight.

Since the first farmer pulled a weed to allow a food plant to grow, man has steadily progressed in his ability to adjust or manipulate the plant's environment for improved food production. The sciences of genetics and plant breeding change the plant itself. Farming systems, in the field, greenhouse, or a capsule in space, change the plant's environment. When combined, they describe the process of manipulative agriculture that has been occurring for centuries. Hydroponic systems simply add to the farmer's ability to control the environment.

Controlled environment agricultural systems such as greenhouses, plastic row tunnels, and artificially lighted kitchen factories will allow further advances in manipulative agriculture. Research, entrepreneurial activities, and just plain dreaming in these areas should be encouraged. Investment by individuals as an occupation to provide a livelihood, however, needs to be examined critically.

Many vegetable greenhouse facilities have closed due to the rising cost of fuel. Hydroponic feeding and watering systems won't save fuel, but sometimes can be used effectively to reduce another major production cost—labor. Hydroponic systems lend themselves to more efficient automation, and coupled with waste heat from industrial facilities, may be financially successful. On the other hand, small greenhouses (usually growing about 1000 tomato plants) employing nutrient film technique, bag culture, or other systems do not provide the advantage of automation.

While most small operators have not been very successful, it is possible to survive as a small grower by producing a high quality product, whether it is tomatoes, cucumbers, or lettuce, and marketing it locally. Small growers experiencing success with one greenhouse should be warned to carefully evaluate their market potential before expanding to two or more greenhouses. In areas where demand is not adequate, the grower can actually end up competing with himself by creating a glut with the extra product and driving down prices. At that point, he is too big for the local market, yet too small to wholesale effectively to a larger market.

A survey of hydroponic greenhouse operations in Illinois and conversations with growers suggest that a single greenhouse growing tomatoes can keep one individual employed at minimum wage and perhaps return an additional profit of \$1000 to \$2000 per year. One greenhouse offers a real possibility as supplemental income for a family or a retirement hobby. Few producers, however, could consider it a means of making a living.

In the future, more efficient heating and cooling systems may reduce production costs. Increased interest in a high quality local product may improve prices. Better understanding of our ability to manipulate the plant's environment may improve production. For today, however, let's continue our research and learn from our mistakes. Let's encourage dreamers and entrepreneurs because they will make the changes. But, let's not hurt those who can't afford to take a risk with unrealistic claims and promises.

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