Using Master Gardeners to Evaluate Home Garden Tomato Varieties

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Home garden vegetable variety trials are not viewed as a high priority at most land-grant colleges. As a result, recommendations often are based on evaluations conducted on varieties recommended for commercial production. Unfortunately, gardeners may have different criteria for quality, with an increased emphasis on taste. For example, tomato varieties that hold or ship well are of little importance to the backyard gardener. Due to the labor involved in setting up these trials, state specialists and agents do not have the time to perform home garden trials. Using Master Gardeners for these trials, however, may be a way to have reliable, replicated studies with limited involvement of state or county staff.

The Master Gardener program in New Jersey is sponsored by Rutgers Cooperative Extension. More than 1000 volunteers have received training in all aspects of home horticulture. In exchange for more than 50 h of classroom training by county and state staff, Master Gardeners are expected to donate their time to the extension service. Traditionally, Master Gardeners assist the agent in handling homeowner inquiries, participate in demonstration or community gardens, and give gardening advice at the annual state flower show.

With reliable labor becoming more scarce, some Master Gardeners have been used as volunteers in established research plots (Relf et al., 1990a, 1990b). Unfortunately, most of this research involved commercial variety evaluations. Although the Master Gardener may receive some hands-on experience, it may not be relevant to his/her interests and background. It is possible, however, that small demonstration gardens could be altered slightly to provide replicated and meaningful studies geared toward evaluations for home gardeners. Studies of this type would allow Master Gardeners to gain experience and knowledge with direct application to their volunteer work.

An attempt was made in 1989 to use Master Gardeners to evaluate home garden tomatoes. Volunteers were trained to identify typical tomato disorders. A special session was held to describe that study and which factors were to be measured and why each was important. Thirty Master Gardeners were involved in the study from the beginning, resulting in a high level of interest. Fourteen tomato varieties were set out in three replications in what had previously been a demonstration garden. All varieties were harvested and weighed, and subjected to taste tests by the Master Gardeners.

The 1989 project was a great success. Master Gardeners contributed more than 300 h of labor. In exchange, they received useful experience that they can pass on to other gardeners. In addition to the results of the tomato evaluations, volunteers learned how to take and interpret soil tests, how to use trickle irrigation and mulch, and the proper use of pesticides.

In 1990, the project was expanded to include six bell pepper varieties. Also, in addition to the variety trials, a small replicated study was conducted to compare the effects of different pruning techniques on the yield of an indeterminate tomato variety. Master Gardeners compared the yield of plants grown in cages with those trained to one stem or two. The results demonstrated that pruning results in an earlier harvest and larger fruit size. For total yield, however, the caged treatment outproduced the pruned treatments by a two-to-one margin. With these results, Master Gardeners answered one of the most commonly asked questions on tomato culture, "Should tomatoes be pruned?"

As a measure of its success, many of the Master Gardeners who participated in the 1989 study returned for 1990. As the results show, using Master Gardeners in a research study examining home garden varieties or practices can be done, both to the satisfaction of the volunteers and to the county and state specialist.

Literature Cited

HortTechnology and the Developing Countries

W. Grierstone

To fulfill its economic potential, horticultural science should be complemented by efficient techniques extending from the producer to the consumer. Often this just is not so,

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particularly when horticultural crops are the focus of foreign aid projects in the less-developed countries (LDCs).

Only too often, time, money, and good will are squandered when horticultural crops are used in foreign aid programs, regardless of the sponsoring agencies involved. I welcome HorTechnology as a promising vehicle in which to deal with the challenges involved in adapting horticultural technology to the LDCs, where so often it is sorely needed. I have been invited by the HorTechnology Editor, to seek the response of our Members in this regard.

I will start with a series of theses that I consider to be crucial whenever horticulture is to be involved in an LDC project.

1) Horticultural crops differ from all others in being not only alive at harvest, but in having to be kept that way until consumed or processed.

2) Projects teaching cultivators to produce horticultural crops for the first time must include a postharvest component.

3) Projects involving horticultural crops must involve horticulturists, both pre- and postharvest.

4) Marketing training is essential and must involve economic and accounting aspects in addition to postharvest handling techniques.

5) Developing country (DC) technologies cannot automatically be transposed to LDCs.

6) The greatest obstacles in adapting horticultural crops to LDCs can be psychological.

I will use the rest of the space allocated to me to expound on each of these "theses."

1) Singularity of horticultural crops. Most LDC cultivators are familiar only with crops, such as grains and beans, that, once harvested, can be treated as though nonliving, or with subsistence crops, such as bananas, coconuts, or cassava, that can be harvested as needed over very long periods. Most horticultural crops need to be harvested at specific and exact stages of development, which sharply conditions how they must be handled. Moreover, many horticultural crops involve successive plantings and many successive harvests. We horticulturists may take such aspects for granted, but they often are ignored by international lending agencies and government officials.

2) Postharvest must be included. It is irresponsible to teach LDC cultivators to produce horticultural crops without concurrently teaching them the critically needed skills required for harvesting and marketing.

3) Horticulturists must be involved both pre-and postharvest. This may seem obvious, but agronomists typically grow for tonnes per hectare, almost regardless of the different pieces involved. I have tried to set up storage demonstrations with a bounteous crop as potatoes grown by an agronomist, hardly any of which were sound enough to store. On another occasion, on a remote African hillside, I stumbled upon a farm structures engineer building a storage intended for onions and potatoes. I had to explain to him and the local growers that it could be for onions or for potatoes; together, they would rot and/or shrivel.

4) A marketing component is essential. Much foreign aid involves efforts to upgrade subsistence farmers to participate in the market economy. This is laudable, but many of them have no idea as to how to function as business people. Even if literate, they often need considerable help in learning to calculate such basics as to how much they can spend on farm inputs, when to sell only the best of their crop at a profit rather than taking a loss on the whole crop, and so on.

5) Scaling down DC technologies. This seems to be a worldwide problem. I have in my file a copy of a letter from a senior FAO administrator saying "...we can give you the names of packing stations in developing countries which are all idle and where you could get the grading equipment free if you are prepared to carry dismantling costs." Sometimes typical DC machinery is appropriate, but often it is not. In the LDCs, labor is cheap and often desperately in need of employment, but machinery is usually expensive to purchase and operate, and difficult and expensive to maintain. Old-fashioned techniques maximizing the use of labor and minimizing the use of machinery are often the best choice.

6) Psychological factors can be insurmountable obstacles to successful completion of horticultural projects. Sugar growers all over the tropics are in serious trouble. I have observed various efforts to help them by attempting to convert them to vegetable farmers. One such was a church-funded attempt to turn small-scale sugarcane growers into tomato growers. Those cane growers were psychologically unprepared for the harsh world of tomato growing. All their lives they had spent most of their time just watching their cane grow and doing little, if anything, to help it do so. Then, when their crop matured, in one furious burst of energy they would burn it off, cut it down, and carry it to the roadside to be picked up by the sugar mill truck. These people were expected to adapt instantly to a dawn-to-dusk regimen of preparing and planting seedbeds, scouting for evidence of seedling diseases before spraying religiously, planting, irrigating, weeding, endless days of very hard labor. Then for many weeks on end, carefully picking their tomatoes at a reasonably exact stage of maturity, then handling them with care as living things to be kept healthy and alive until consumed. It would be about as reasonable to expect them to turn into computer operators overnight.

Another enormous psychological barrier is the innate resistance of many LDC farmers to participate in cooperatives. Just the thought of letting someone else sell their produce can be mind-boggling to 1-ha Jamaican farmers who, all their lives, have only sold to "higgles," who climb the hillsides to find them. Also, in my limited observations, LDC vegetable growing cooperatives have the same problems that are so glaringly obvious on Soviet collective farms. Everybody's business becomes nobody's business.

This is the situation as I see it. Any interested readers should let the editor know if they think HorTechnology can have a role in dealing with these considerable problems. If so, will you be willing to contribute? I have agreed to serve, at least initially, as an Associate Editor to get this started if there is sufficient response.
Does Modern Plastics Technology Have a Place in Organic Vegetable Farming Systems Research and Farming Enterprises?

William J. Lamont, Jr.

This is a question raised frequently among university personnel and the organic farming community. The answer will in many instances depend on the personal philosophy of the individual respondent—ranging from an absolute, emphatic “no” for the organic purist to “yes” from a producer who considers “organics” mainly as limited or nonuse of pesticides and synthetic fertilizers.

For those of us at the universities who are involved in research programs aimed at developing new organic farming systems, and extension personnel that are extending this information to growers, this question needs to be addressed.

Before the advent of modern commercial synthetic fertilizers (i.e., prior to World War II), vegetable producers routinely used considerable amounts of livestock manures, soil-improving legumes in rotation with vegetables and other agronomic crops, and green manure crops in their farming operations. After World War II there was a shift away from integrated or mixed farming operations that produced vegetables, livestock, and agronomic crops to more-specialized or single-commodity-type farm enterprises. This change resulted in a scarcity of manure, which led to a rapid increase in its price. This shift also resulted in the decreased use of nitrogen-supplying legumes by many vegetable producers. This situation prompted researchers to determine if acceptable yields were possible using new synthetic fertilizers. The general conclusion drawn from the research was that synthetic fertilizers were capable of replacing, to a large extent, the nutrient value of manures and soil-improving legumes.

The commercial agriculture sector is again, I believe, experiencing a redirection, as producers look for alternative cropping systems that not only make sense from an economic standpoint, but are more compatible with the environment. The question becomes—do we include modern plastic technology, i.e., plastic mulches, drip irrigation, and row covers, in these new organic farming systems? I believe that we should, for the following reasons.

First, the use of plastic mulches, drip irrigation, and row covers are management tools that offer both organic and nonorganic vegetable growers many benefits. Some of the more obvious are: 1) earlier crops, 2) higher yields, 3) higher-quality produce, 4) weed control, 5) reduced water use, 6) reduced soil erosion, 7) reduced disease incidence, 8) reduce fertilizer leaching, and 9) increased opportunity for insect management. The major drawback or negative side to plastics is proper disposal of the used product. This concerns me as a researcher and as a citizen. This issue is being addressed vigorously by the plastic industry in such associations as the American Society of Plasticulture, which has formed a Plastics Disposal Committee made up of representatives of the major manufactures of agricultural plastic products. They are approaching the disposal problem from two directions: 1) recycling and 2) energy reclamation of used agricultural plastics. The value of the plastic product is not lost if it is recycled or incinerated to reclaim the BTU locked inside. The proper disposal of plastic waste is by no means limited to the agricultural sector.

As the agricultural sector seeks redirection, I believe that the opportunity exists to evaluate new production systems that incorporate the latest in plastics technology with organic fertilizers, and ask “Can we maximize the yields of selected vegetables (tomatoes, muskmelon, watermelon, cucumber, pepper, eggplant, okra, etc.) per unit of land using the latest plasticulture technology and various organic fertilizers?”

I believe that, by using plastics technology and organic fertilizers, growers will be able to double or triple productivity per unit of land while conserving limited water resources. There will be the opportunity to reduce fertilizer leaching and thus prevent groundwater contamination. The need for chemical weed control is reduced—a requirement for organic producers. Another attractive benefit is assistance in insect management afforded by reflective mulches and row covers. Disease pressure can be lessened by creating a microclimate around the crop that is unfavorable for diseases. This system can promote and enhance soil productivity and reduce soil erosion by wind and water.

In closing, I believe that plastic technology has a place in modern organic vegetable production systems, and, through its proper use and disposal, it will continue to be a valuable management tool for organic and nonorganic vegetable producers.

Reader’s Forum

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