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ECONOMIC FEASIBILITY OF GROWING ORGANIC CHERRY TOMATOES IN HIGH POLYTUNNELS FOR DIRECT MARKET VENUES

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INTRODUCTION

The economic benefits of growing standard large tomatoes using high polytunnel (HPT) technology has been well documented in the Northeast. The high value of large tomatoes can justify the extra costs in time and materials associated with the use of this technology. It is also well documented that this agrosystem has helped improve the income of farmers who have adapted this technology to their farming mix.

The primary objective of this applied research project was to provide farmers with another tool by which they can generate income through direct marketing. Could the extra expenses of HPT technology be justified when growing cherry tomatoes? Can the direct marketing of cherry tomatoes grown in HPT help the profitability of this agrosystem? With more farmers taking advantage of direct marketing venues (e.g. CSA's, farmstands, pick-your-own, farmers' markets), can the retail prices received by these farmers offset the extra expenses of HPT production? My research was aimed at addressing these questions. The research performed and the data collected during this project was used to evaluate the cost effectiveness of growing cherry tomatoes with HPT technology. In my opinion, the only way this system could be justified is if farmers marketed their cherry tomatoes through direct market venues.

During the growing season, farmers are so busy juggling the many components of their farming operations that they rarely have the time or the will to assess their actions. If a crop or agrosystem is an absolute failure or a complete success then assessment is easy. The crop or system that preforms in the gray areas between failure and success are more difficult to evaluate. During the previous two growing seasons, I have successfully grown cherry tomatoes in a high polytunnel without taking a hard look at the economic viability of this agrosystem. During the 2001 growing season, and armed with a grant form the Northeast Region SARE Program, I recorded all the pertinent data associated with the production and marketing of the HPT cherry tomatoes.

The cherry tomatoes were grown using standard HPT techniques and organic management methods. Direct marketing venues like a farmers' market typically generate the greatest economic benefits for the seller. As such, this marketing strategy was selected to sell the cherry tomatoes. Most of the cherry tomatoes harvested during this research project were sold at a farmers' market in Pittsfield, Massachusetts.

METHODOLOGY

Three cherry tomato cultivars were selected for this research project. Sweet 100, Gold Nugget and Sweet Olive were selected primarily because they were successfully grown at Summit Farm in high polytunnels during previous seasons. Sweet 100 is a standard, indeterminate, round, red cherry tomato that has good disease resistance, a wonderful flavor and is prolific. Gold Nugget is a prolific, round, yellow-fruited, determinate variety with good flavor. While, Sweet Olive is a determinate, red grape-shaped tomato that is also very sweet. Two succession plantings of all three varieties were conducted in the research HPT.

On March 28, 2001, the first succession of tomatoes (all three varieties) were seeded in a 20 row germination tray and germinated with the aid of a heating mat. On April 25th, the second succession of tomatoes (all three varieties) were started using the same methods as the first succession. Both successions of seedlings were grown under lights until they were mature enough to be transferred to the greenhouse. In the greenhouse, they were transplanted from the germination tray into 3 inch X 3 inch round peat pots that contained a compost-based growing mix. Prior to planting the cherry tomatoes in the HPT, the tunnel was fertilized with an organic fertilizer, and rototilled. Then the entire 588 sq. ft. of growing area within the HPT was cover with black plastic mulch. The first succession plants were grown in a greenhouse until May 12th, at which time they were planted in the HPT. The HPT used was a rather typical hoop house that measures 14 feet wide and 42 feet long. The second succession was planted in the HPT on May 29th.

The first planting was composed of 42 Sweet 100, 27 Gold Nugget and 23 Sweet Olive plants. The second succession planting contained 12 Sweet 100, 15 Gold Nugget and 13 Sweet Olive plants. Eventually, the HPT contained a full compliment of cherry tomato (54 Sweet 100, 42 Gold Nugget and 36 Sweet Olive) plants or a total of 132 cherry tomato plants.

Three rows of the Sweet 100 were planted and trellised down the middle of the HPT. Please refer to the attached photographs for details. This area in the HPT is approximately 6.5 feet in height which provided these indeterminate tomatoes enough room to grow. Each row was spaced two feet from the other rows and the tomatoes were planted two feet within a row. A 2 feet wide aisle was left between the Sweet 100 plants and the shorter varieties near the HPT walls. Please refer to the attached photographs. A double, staggered row of determinate Gold Nuggets was planted along the east wall and a double, staggered row of the determinate Sweet Olive was planted along the west wall of the HPT. All of the determinate tomatoes were planted 18 inches from other plants in all directions. Both rows of the determinate varieties were staked with 4 feet long wooden stakes and tied with twine as needed.

The internal temperature of the HPT was regulated by rolling up the sides to allow for greater or lesser ventilation as needed. Water was supplied through a drip irrigation system. The HPT growing environment was maintained to provide the best growing conditions possible.

RESULTS AND DISCUSSION

Unlike recent growing seasons, the 2001 season at Summit Farm was blissfully "normal". With our warm days and cool summer nights, the use of high polytunnels is definitely an advantage for growing warm weather crops in the Berkshire Hills of Massachusetts. The weather did not greatly influence the amount of tomatoes produced in 2001 and based on past crop yield histories, an average yield of tomatoes was grown.

The harvest season started slowly, as it always does with tomatoes. We started picking a few Gold Nuggets on June 30th and continued harvesting cherry tomatoes until October 4th. Each variety had its own production peak with the greatest overlap in peaks occurring between July 23 and September 6. A total of 201 pints of Gold Nugget, 251 pints of Sweet 100 and 138 pints of Sweet Olives were harvested for a total of 590 pints. Culls and substandard tomatoes were never harvested. All of the cherry tomatoes were sold at farmers' market. At first, only marketable fruits were harvested then the supply overwhelmed the market demand. More marketable tomatoes were produced than we had the ability to sell at farmers' market. Time did not allow us to search out other markets so some marketable tomatoes were not harvested and consequently not sold. In my experiences, this is a realistic situation on many farms during a very busy growing season.

During the research period, the work hours for the following tasks were recorded; growing the transplants, preparation of the HPT, planting tomatoes, heating and cooling management of the HPT, pruning, staking and trellising, harvesting, and packaging. The total numbers of hours devotes solely to the production of the cherry tomatoes (from seeding to sales) was 94.5 hours. The costs of supplies which included the HPT plastic covering, black plastic mulch, seedling production, wooden stakes, organic fertilizer, and packaging materials amounted to $336.00.

When calculating the production costs, the initial cost of the HPT was not included nor was the shipping costs of the cherry tomatoes to the farmer's market. The HPT structure had been used nine seasons prior to this research. The expense of shipping the tomatoes to market was negligible because we were shipping to farmer's market anyway so bring a few pints to tomatoes added very little to our shipping costs.

CONCLUSIONS

There are many methods that could be employed to analyze the data collected in this research. As stated in the introduction section of this report, farmers have difficulty evaluating the extent of profitability of crops or agrosystems that are located in the grey zone between complete success and total failure. I chose to use an on-farm, realistic, rather simplistic evaluation process to explain the data collected during the research. Basically, the assessment process involved looking at the production expenses (time and materials) and comparing them with the returns.

If we assumed an employee receiving a wage of $8.00 per hour was responsible for the production of the cherry tomatoes (94.5 hrs.) then the total labor costs incurred would be $756.00. If this cost was added to the cost of supplies ($336.00) then the total production cost would be $1092.00. All the cherry tomatoes harvested (590 pints) were sold at farmers' market or from the barn for $2.50 per pint for a total of $1475.00. Based on this farm-style economic analysis, a net profit of $383.00 was realized.

To improve these numbers, a farmer could increase the population density of plants in the HPT. This could result in greater production, but increased plant density could also lead to other problems like disease pressures. The crowding of tomato plants could possibly make harvesting more difficult in the crowded conditions and of course difficult translates to more time and time means money.

I grew more cherry tomatoes than I could sell at my farmers' market. Better marketing could improve the economics of growing cherry tomatoes in high polytunnels.

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End view of the research high polytunnel

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Trellised Sweet 100s in the middle of the high polytunnel

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Aisle between trellised and staked cherry tomatoes