

Season Extension and Cultivar Evaluations for Increasing Farmer Profitability Using High Tunnels in the Baltimore/Washington Metropolitan Marketing Area

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Introduction/Abstract

In recent years, there has been a resurging interest in locally-grown food. More marketing opportunities have emerged, and there are now many innovative farmers growing for local markets in the region. High tunnel structures provide an economic bonus for farmers who grow high value crops to be marketed within the Baltimore/ Washington metropolitan marketing area. The research team identified 5 experienced farmer-cooperators in Maryland who were willing to invest in another high tunnel on their own farms. After year one, 2 original cooperators were replaced by 2 new cooperators for the remainder of the project. Each farm was compensated for their time collecting data (harvesting crops grown in their tunnel.) Cooperator meetings were held to stimulate the exchange of information among cooperating farmers as they refined their growing systems to increase profitability during the time of this project. Many farmer field days, high tunnel presentations at meetings, and farm visits occurred during this project in an effort to demonstrate the benefits of high tunnels to farmers in the region. The results of this project demonstrated that growing in high tunnels can: 1) improve crop quality, 2) increase yields, 3) extend the harvest season on both ends, and 4) increase farm profitability with good tunnel management. Good tunnel management includes: 1) management of the roll up sides to trap heat in during spring and fall and to allow for airflow and cooling during the summer, 2) irrigation management, and 3) spending time in the tunnel daily to monitor for plant diseases and insect pests. Most importantly, good management requires a commitment to find solutions and act quickly.

Materials and Methods

Innovative farmers were selected to participate in this project. Our goal was to work with the farmers, to encourage communication among the farmers, and then use their experiences as models to demonstrate to other farmers the economic benefits from high tunnel production by increasing overall farm profitability. A 21' x 48' high tunnel was selected as the standard growing area for data. Each farmer collected their own harvest and income data. The cooperating farmers met with project team members as a group and decided that three rows of tomatoes would be planted early with one row of one variety being standard in all of the tunnels. Each farmer would select 2 additional varieties for the remaining 2 rows. The farmers would follow the tomatoes with crops of their choice and harvest and income data was collected to add to the total income for the high tunnel for the season. A "Year in Review" end of season meeting was held with project team members and cooperating farmers after years 1 and 2. These meetings were beneficial to reunite the group to discuss the previous season and to initiate changes for the next season.

During the summers of years 1 and 2 a technician was hired to visit the cooperating farms one day a week. The technician assisted the farmers in their tunnels, properly trained the farmers on data collection and was the eyes and ears for the project team members. This was very beneficial for both the farmers and the project team members. In year 1 and 2 unexpected problems occurred and the technician's weekly visits alerted project team members of problems which led to timely diagnosis. Project team members Bryan Butler and Mark Davis visited cooperating farms regularly and assisted the technician during the project.

Eight field days were held during the project period. Over 350 participants attended the field day events. Most field days were held in the evening as twilight events with attendance averaging 35 to 45. All of the twilights were promoted extensively by Future Harvest, Maryland Cooperative Extension and local papers. But one twilight was attended by over 100 people as local newspapers publicized the event extensively to local farmers and consumers.

Three project high tunnel presentations were made at the Future Harvest "Farming for Profit and Stewardship" conference from 2006 thru 2008 with over 200 participants in attendance. The presentations highlighted each year's production successes and challenges of the cooperating farms. These presentations also gave the cooperating farmers a chance to answer questions from the audience and provided a free flowing educational discussion among farmers.

High tunnel presentations were made at three other Maryland and Delaware conferences with over 85 attendees. High tunnel presentations were made at the West Virginia University "Marketing for Success" conference in 2006 and 2007. Project team members Mark Davis, Bryan Butler, Rick Hood and Jack Gurley presented a six hour pre-conference program "High Tunnels: From Construction to Production" in 2006 with over 100 participants. In 2007, Mark Davis presented "High Tunnel Tomato Production" to over 50 participants.

Late in the project team members Bryan Butler and Mark Davis visited a few farmers who, after attending field days and or conference presentations, showed great interest in building a high tunnel. These farmers were unsure of what size tunnel to buy, the proper location on their farm and how to get started building a tunnel. These "one on one" visits were very informative and helpful for the farmers in assisting them to make their decision on building a high tunnel. The visits were very educational for Butler and Davis as they discovered a key barrier for farmers to building a high tunnel. The key barrier was the construction process itself for most market garden vegetable farmers. Many do not see themselves as having the skills needed to build a high tunnel. These are truly "hands in dirt" farmers who love to grow and don't see themselves as being mechanical. Many farmers attended the conference sessions presented by Butler and Davis on "How to Build a High Tunnel" and during field days high tunnel construction was covered thoroughly and still many farmers found the building component a major barrier for increased adoption of high tunnels on farms.

The concept of "on-farm research" when written on paper has the appearance of just another research component. For this project the "on-farm research" developed into two components. The first component being the season extension of tomatoes grown in high tunnels on farms, and the second component became the "sociology component" that developed as a result of working closely with five farms for three years. While all of the project team members had many years of on-farm research experience, the challenges of working closely with these farmer cooperators was unexpected and required many extra hours of project team management. During the planning phase of this grant, the project team was confident it had selected five outstanding farmer cooperators to participate in the grant. But after year one, for various reasons, two of the original farmer cooperators would be replaced and two new cooperators were

added. Because of the need to change cooperators, the project team developed a “cooperator agreement” which the farmer-cooperators signed prior to starting year two of the grant. This helped to insure cooperator performance for the remaining two years of the project. The need to develop the cooperator agreement was surprising, took time to develop, and was stressful for the project leaders. Another challenge for project leaders was the unwillingness and or hesitation of some farmer-cooperators to adopt agronomic and high tunnel management recommendations by Butler and Davis to solve or minimize problems in the high tunnel during the growing seasons. Some farmers also faced challenges with balancing management time and labor between their high tunnel and field production as the season progressed. This was especially true for the cooperators with larger field production. All of the cooperators understood that the high tunnels returned a much higher income when compared to the same area of their field production, but field production tended to take priority over tunnel production. This led to reduced income from their high tunnels. At times these challenges led to frustrated project leaders and created awkward relationships with the farmer-cooperators.

Results and Discussion/Milestones

The majority of the project’s accomplishments/milestones were reached as scheduled. The tunnels were erected on time and ready for the 2005 spring season with the assistance of Butler and Davis. All of the meetings with the farmer cooperators and project team leaders were held as scheduled throughout the three years of the project. Harvest and income data from each cooperator was collected as scheduled for the economic analysis. After analyzing year one harvest and income data, it became apparent to project team leaders that doing a comparative analyses among the five cooperators would not provide accurate results. While each of the cooperators had similar marketing mixes of farmer’s markets, CSA’s, wholesale and or restaurant sales, each farmer had different harvesting schedules. Some harvested every day as they needed tomatoes almost every day for their marketing mix. Other cooperators harvested only when they had orders from wholesalers or restaurants, or the day before their CSA pick ups and farmer markets. So project leaders decided a “case study” for each farmer cooperator would provide accurate economic results for this project.

The outreach and education components of the project were completed with the majority of field days occurring as twilight events in 2006 and 2007. These twilight events were well attended and gave many interested farmers the opportunity to see a tunnel in production and ask questions to the cooperator and tunnel project leaders. The high tunnel sessions at the Future Harvest meeting were completed as scheduled all three years of the project. Many additional project high tunnel presentations were made at conferences in West Virginia and Delaware during the project period. These presentations truly made this a mid-Atlantic regional project. Attendance by farmers of the twilight events, presentations at the Future Harvest meetings and other conference presentations exceeded 600 farmers. The performance target of 40 new high tunnels built as a result of this project was met. The project team can claim 41 high tunnels being built as a result of this project and we are sure there are more that we are unaware of. Project leaders are confident the number will continue to increase, but tracking new high tunnels erected is difficult and time consuming.