

SARE GROWER REPORT
PROJECT # FNE97-164
Submitted: 12/98 by
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1. My project goals were to test the suitability of June-bearing strawberries for high tunnel production in New England. Also to test the feasibility of double cropping with later season cherry tomatoes.

While I still think double cropping would work well, I did not attempt to double crop with tomatoes in 1998. My early high tunnel tomato crop was very late this year due largely to a wet, cool, cloudy June. To have double cropped the strawberry tunnels would have resulted in too much late season tomato production. Also, by the end of June, the strawberry tunnel plastic had been nearly destroyed by the repeated heavy rains. Recovering with new plastic was not an economic possibility.

2. My farm is still 100% certified organic but grew to include 14 acres of field vegetables and greenhouse grown transplants and mature tomatoes. In 1999, 20 acres will be in cultivation. All production is still in Whately, Ma.

3. Cooperators were local field berry growers who I used to gage relative earliness of tunnel grown berries and to compare tunnel and outdoor berries for their performance in inclement weather.

4,5,6. See report.

7. The yields of fruit I got were not enough to cover expenses, even at the high price I was able to get. I do think however yields could be higher and prices could be a bit higher. Total sales of fruit was \$2700. (1550 pints at \$1.75) The funds I requested from SARE helped to defray what was probably a loss and certainly a loss when opportunity cost is considered. I know I did not request all the money I was granted, but felt it best not to request the full amount because I never planted the late tomatoes, an expensive part of my original proposal.

8,9. See report.

10. I have shared my knowledge locally, with growers and informally with extension, focusing on how I would proceed if I were to continue.

11. I presented a workshop on high tunnel strawberries at the NOFA Summer Conference. I think some people will try tunnel production in 1999. At the conference, I talked a lot about building a tunnel over existing strawberry beds as most of the attendees at my workshop were berry growers.

HIGH TUNNEL STRAWBERRY PRODUCTION THE PROCESS

ESTABLISHMENT YEAR -1997

Three varieties ('Annapolis', 'Kent' and 'Northeaster') were planted on June 1, 1997 in three existing high tunnels on a site I have been managing for several years. High tunnels, to me are unheated, unelectrified greenhouses with minimal if any electronic controls. I chose the relatively late planting date in the hope of eliminating some early cultivation. During the establishment year, none of the tunnels were covered.

After incorporating a green rye cover crop, the soil was enriched with 50# of linseed meal and 10# of a bagged organic fertilizer with an analysis of 7-2-4 per 2400 sq. ft. tunnel. These supplements fulfilled the pre-plant recommendations made by my soil testing company.

Five raised beds 6 inches high and 30 inches wide were made in each house and a staggered double row was planted in each bed. In-row plant spacing was one foot and the distance between rows within the double row was one foot. This (not coincidental) worked out to a density of 1000 plants per 24x96 high tunnel.

As needed, the crop was irrigated with a simple overhead sprinkler system. Walkways were rototilled to control weeds while beds were cultivated with hoes and by hand. Three pounds of additional fertilizer (7-2-4) was added to each bed during a cultivation in mid-July to complete the test recommendation.

In August, oats were sown over the walkways and beds. My hope was to smother weeds and to grow, on site, some of the mulch that would be required for winter. The crop was mulched in late November with approximately #500 of rye straw per tunnel.

First Year Successes:

- 1) The planting density was a good one. The beds filled in nicely.
- 2) The later planting date made it fairly easy to control weeds.
- 3) The oats are a great idea.

First Year Mistakes:

- 1) The decision to make raised beds came from my experience with field berries grown in much heavier soil. They were unnecessary and increased the water requirement (we had a rather dry summer). Also, a single row of mother plants grown on flat ground would have allowed very close cultivation with the rototiller, and less hand work.
- 2) The late transplanting date helped with weed control. The trade off was rain. Earlier plantings in our area would typically receive more rainfall early in establishment.
- 3) A trickle system would have been easier to manage and might have resulted in better establishment.

HARVEST YEAR: 1998

On 3/4 I raked off the mulch. The 85 degree daily temperatures we had in early March made me wonder if I had missed the boat. After a brief spell a week later (with night time lows in the single digits, I decided I had not.) During the cold snap I recovered the plants with mulch.

On 3/18 I covered the greenhouses with an outer layer of 4 mil, one year greenhouse poly. The next day I installed an inner layer with used plastic of varying quality. This created a dead air space and hopefully, better insulation.

Also on 3/19, I removed the mulch for good. Drip tape was installed, and one layer of spun bonded row cover (ree may) was installed for additional heat.

By 3/30 1-2 inch shoots had emerged.

On 4/12 the first flowers appeared on the 'Annapolis'. Flowers followed on the other varieties two to three days later.

On 4/17 I decided we were at 10% bloom, removed the ree-may and began pollinating daily by brushing the tops of the plants with a whisk broom. One quick weeding was made around now. There were few weeds at this point.

Temperatures were managed by opening end walls (not the sides), and removing or installing the ree-may as needed. This method got us safely through several frosts and one night, temperatures of 17 degrees. (two layers of ree-may had been spread in each house for the night.

By 5/12 we had one inch fruit in every house.

By 5/18 we picked the first three pints.

On 5/20 we began picking for market. Harvests (3x per week) started at about 36 pints on a pick and increased to 240 by 6/1.

On 5/30 the sides of the greenhouses were rolled up for good.

By 6/7 we were down to 36 again . Harvest was over by 6/15.

Total yield was 1550 pints. 650 were from the Annapolis. 450 each were from 'Kent' and 'Northeaster'.

On 6/20 I began bed renovation , mowing the tops off the plants, rototilling to narrow the beds and adding some fertilizer as recommended by a soil test. The tunnels were uncovered completely.

By 7/4 regrowth was coming quickly.

NOTE:

This year I also established three additional tunnels in 'Annapolis'. I chose this variety knowing only that it was more vigorous than the other two. (by planting time I had not yet seen the fruit). I followed more or less the same process as the year before but backed the planting time back to early April (trading weeding for natural irrigation). To help with cultivation, I planted the berries in a single row this time, with mother plants only six inches apart. Also trickle irrigation was installed in the new houses and delivered water precisely where it was needed with little effort.

Second year successes:

- 1) We were picking nice strawberries 3 1/2 weeks before local field berries were available. This established us in the market first and we were treated preferentially when our production overlapped with other growers.
- 2) We sold our crop for \$1.75 per pint wholesale. This is an excellent price for strawberries. It was about even with California berries which were of horrible eating quality.
- 3) The trickle irrigation is a must and worked very well.
- 4) By growing in a tunnel, foliar and fruit wetness from rain is minimized (not eliminated because of condensation and humidity). This greatly helped in a year when field growers experienced 50%-90% losses due to excessive June rains (16 inches in parts of Western Mass.

Second Year failures:

- 1) The overall difficulty I had was managing the tunnels this year. At times I knew they were getting too hot but did not have the time or manpower to manage them as well as I know I can. My tunnel site was once central to my farming operation. Now it is distant and a small percentage of what I do. The key to keeping the site would be to automate it with vents and fans or hire someone specifically to manage the site with its current fully manual controls.
- 2) The broom is not great for pollinating (too rough on the blossoms). A leaf blower or hives of bumblebees would be better.
- 3) A simple system for rolling the sides up and down is a must. Excess heat compromised the quality of my crop.
- 4) I should have acidified my soil to a p.H. of 6.0. It had been elevated to near neutral for tomatoes. Also, boron deficiency expressed itself as misshapen fruit. The deficiency was caused by elevated p.H. and marginal soil levels.
- 5) To really get the crop in early, plastic should stay on the houses through the winter. This is not possible with my tunnels as they are wood framed and not designed to carry a snow load. A peaked Gothic style pipe frame house would be best. The best I could do is cover in mid February and plan to do some manual snow removal.
- 6) Yields were weak because of mediocre berry size and too many misshapen and soft skinned fruit. I think by correcting soil p.H., adding Boron and venting more aggressively yields could be much higher.
- 7) Not demanding \$2.00 a pint. I know I could have and would in the future but my buyer was skeptical and I depend on this market for 20% of my farm's sales.

THE FUTURE:

I have decided to get out of high tunnel strawberry production in 1999. The wood framed houses I had were beginning to decay and would have required major reworking to keep. I have removed them. The real problem is not being close enough to this site to manage it properly. I would like to try berries in a tunnel again, but need the houses to be a bit more automated or more integrated into the rest of the farm. Also, I would never build wood framed houses again as they damage plastic and decay too quickly at the soil line.

With a commitment from my buyer this year to buy from me preferentially next year, I will manage the site as field berries next year.