

## **Growing Greenhouse Tomatoes at Holmberg Orchards**

Russell Holmberg  
Holmberg Orchards  
Gales Ferry, CT

[info@holmbergorchards.com](mailto:info@holmbergorchards.com)

### *Background*

Holmberg Orchards is a diversified fruit and vegetable farm in southeastern Connecticut. We have been in a transition since late 1980's away from wholesale apple production, towards a retail focused, multifaceted farm. We operate a successful pick your own operation from July through October and a farmstand that remains open year round. For the past ten years, a small greenhouse tomato facility has been a part of our operation. Greenhouse tomatoes are a good fit into our operation for the following reasons:

1. They provide local, high quality produce early the season. This helps to boost store sales by getting customers in the door.
2. It is a source of early season cash, adding to our goal of year-round revenue.
3. It is a fun, invigorating project to work on during the winter months.

### *Crop planning and timing*

Greenhouse tomato production is input intensive, both in time and capital. A thorough investigation of the market is incredibly important prior to construction. At Holmberg Orchards, our goal is to produce only enough tomatoes to meet the needs of our own farmstand, purchasing tomatoes on the open market when necessary. We have no ambitions of entering the wholesale market.

To size our facility and plan for production, we started by looking at store sales and market prices for last 2-3 years. The greenhouse tomato supply in the wholesale market would peak and dip, while our customer demand was fairly constant. Our strategy was to have the bulk of our tomatoes come in early – 2 weeks before the first big peak on wholesale market – taking advantage of the highest price. As our supply dips, the wholesale market peaks and we can buy in tomatoes as we need them at a low price.

Given these parameters, we chose to build a small house and farm it intensively. The small footprint helps with heating bills and makes siting easier. Intense techniques like irrigation computers and leaf pulling ensure the highest production per square foot.

### *Production*

We seed *Trust* tomatoes around the first of the year in a growth chamber in our propagation house. This chamber looks like a mini-quinset house made from pvc pipes bent over a bench. It is covered with milky white plastic and heated from below using propagation heat mats. With this structure over the bench, we do not have to heat the house surrounding it at all. The plastic is removed on sunny days and always applied at night in order to maintain a temperature over 55°F. Daytime temperatures, even on the coldest day of winter, will remain around 90°F

In early March the plants are moved to a clean, sanitized tomato house. Plant density is 3.5-4 plants/sq ft. We grow on at 85°F days and 65°F nights. They are planted in coir filled five gallon bags and trained to a single vine using twine and tomato clips. Leaves at or just below the lowest fruiting cluster are removed to aid in air circulation and control vigor. We also practice

fruit thinning on the first two clusters – taking them down to 5 or 6 fruit per cluster, depending on light conditions. This increases size without sacrificing weight per cluster. Bumblebees and hand pollination have been used with similar results; the later is tedious but provides a daily opportunity to scout for insects and diseases that bees ignore.

Nutrition is provided via drip irrigate using the standard two-injector, constant liquid feed, hydroponic setup. The amount of water is controlled by a small light-collecting computer and a solenoid. It is calibrated to irrigate at an approximate 10% dry down (by weight). We monitor our nutrition program weekly by checking the EC of our solution and also measuring stem thickness at the top of the plant. An EC test confirms the health of the injector and a stem caliper gauges the vigor of your plants. Appropriate adjustments are then made to the nutritional program based on the vigor of the plant and the growing conditions at the time.

We begin picking fruit in early June and continue through September. Yields per week vary considerably as the season progresses. We typically have one to two weeks of high production followed by one to two weeks of reduced production as we are between clusters. Our annual yield is usually 15-18 lbs per plant.

Over the years we have experimented with grafting as a way to increase yields. We conducted trials using *Maxifort* on a single head and on a double head. The single head *Maxifort* is indeed robust, but far too vegetative. The double head *Maxifort* provided a well balance plant, but we did not see an increase in production compared with Trust on its own roots. Our conclusion was that time and energy was better spent fine tuning plant growth during the season rather than grafting early in the season. This conclusion is based on our production circumstances where growth is occurring in a well sanitized house with a sterile planting medium. This conclusion likely does not apply to production in native soils.

#### *Problems along the way*

Our biggest problem with greenhouse tomatoes is the botrytis. Mild infections will kill blossoms and severe infections kill green tomatoes. Lesser infections will cause ghost spotting on the fruit. We have given up spraying for botrytis years ago. Instead, we have made every effort to reduce humidity. These efforts include: running higher night temp and cooler day temp, avoiding irrigations that occur at or around dusk, and pruning for air flow around the cluster.

Insect problems that we combat annually include aphids, mites, and fungal gnats. Whiteflies and tomato hornworms will make an occasional appearance. Typically, we only resort to a spray when we see mites, as the rest of the problems can be resolved with natural predators or cultural controls.

#### *Looking forward*

Perhaps our greatest foe in this endeavor is the oilman. In future years, we hope to see less of him. Our ambition is to heat our house with radiant floor heat, using pipes positioned directly under the bags and heated by solar panels. Additional heat would be provided by a remote wood boiler and a Modine-style heater. This would allow for an earlier start and certainly high profits.