

Plasticulture at Nourse Farms with Bare Root Dormant Plants

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Nourse Farms is located in Whatley, Mass along the Connecticut River. We farm about 450 acres, with 20 acres dedicated to fruit production. Our specialty is nursery production of strawberry and raspberry plants. Our fruit production for wholesale and PYO, includes 8 acres of Strawberries, 8 acres of Raspberries, 2 acres of Blueberries, and 2 acres Currants and Gooseberries.

We have been producing Strawberries since 1971. We began with matted row system. We changed to ribbon row system in the late 70's. Now we're on a modified plastic culture system, for reasons you will note in my talk today. I'll begin with a brief history of plasticulture in the U.S. followed by our experiences at Nourse Farms.

Plasticulture Overview

The early development of plasticulture strawberry farming in the eastern United States was led by Dr. Barclay Poling in North Carolina. Dr. Poling developed growing techniques that were effective for both reducing crop losses and increasing farmers' ability to meet marketplace demand for fruit. Early plasticulture methods developed around planting "plugs" (small green plants growing in plastic trays) under black plastic mulch. Farmers saw notable success and many growers throughout the mid-Atlantic and Southeastern states began experimenting with plasticulture farming. Today thousands of farmers throughout the country grow small-fruit and other produce using plasticulture methods.

In recent years plasticulture farming has evolved dramatically through experimentation, field trials, and working relationships between commercial growers, nurseries and experimental stations. Today, dormant bare-root berry plants have become the choice for many growers. The great majority of berry growers we work with at Nourse Farms are planting bare root dormant plants, especially in zones 4-6.

For today's farmer, the term 'plasticulture' refers to planting and growing techniques that may, or may not, involve the use of any plastic material. The old idea that plasticulture farming must mean plastic mulch has changed. For example, for a progressive strawberry grower, 'plasticulture' farming begins with raised beds of dual-row strawberries planted to stand with drip tape irrigation. Plastic mulch is an option. There is no single best method for all growers.

The following outline offers some insight into the successful elements of plasticulture farming at Nourse Farms. Nourse Farms planted its first acre of plasticulture berries in 1994, today plasticulture techniques are used on all our berry plant and fruit production acreage.

Key Benefits of Plasticulture

- ◆ SUPERIOR WEED CONTROL ◆ REDUCED LOSS OF SOIL MOISTURE AND NUTRIENTS
- ◆ LONGER POTENTIAL PICKING SEASON ◆ EFFICIENT AND CONVENIENT HARVESTING
- ◆ INCREASED FRUIT SIZE AND YIELD ◆ MORE MARKETABLE FRUIT

Weed Control

We encourage germinating and killing weeds before planting.

We highly recommend laying plastic 30-40 days before planting. However, shorter intervals can also be successful.

Herbicides are often used between rows, but care must be taken that these chemicals do not run off the plastic and concentrate in holes.

Runner Control

Plants cannot root on plastic. Runners will only root where the grower allows. The use of growth regulators should be considered to inhibit runner production. Research and strawberry physiology indicates runner initiation begins after flowers are produced. Experience dictates that monthly applications are better than one large dosage.

Clean Picking Surface

Removing runners and dead leaves reduces incidence of fruit rot, Fungi cannot survive on plastic. Our recommendation is to do this in the spring when the mulch or row cover is removed, prior to applying a row cover. This is not as important if straw mulch is maintained for harvest. When the plastic is clean it also allows water to move away faster, so fruit is damaged less by downpours and excessively wet periods.

Drip Irrigation

Drip irrigation allows a systematic approach to effective water management and timely fertilizer application throughout the growing season. Growers can truly maximize efficiencies and growth.

We regularly see the added benefit of evaporative cooling. Improved plant respiration means plants do not overheat and shut down. Fruit quality is better and shelf life is extended.

During harvest we irrigate daily for 2-6 hours, maintaining soil water capacity at 90 –100%.

At renovation no re-establishment of the planting occurs. Plants are never hurt or stressed thanks to plentiful moisture. This has been especially evident with ‘Jewel’ strawberries.

We fertilize throughout the entire growing season, adding nutrients through the drip system at low rates of 1 to 3lbs of nitrogen per week per acre, along with micronutrients.

Management of Ripening Times and Season Extension

Plasticulture allows growers the advantages of more control and more flexibility for managing fruiting schedules. If straw mulch is left on top of beds, covering the plastic mulch, plants will closely follow the growth and fruiting schedule of plants being grown with traditional methods.

If straw is removed from the beds covered with plastic mulch in early spring, the black mulch will absorb and retain the sun’s warmth. Plants will grow more quickly and fruit ripening will be around 7 days earlier than traditionally grown plants of the same variety. Leaving straw on the plastic mulch a few days longer will delay plant growth and fruiting. Your harvest season can be extended. Caution! Never leave straw mulch on plants as they begin to grow. This will reduce potential yields!

To summarize, we can say that with plasticulture the same variety of fruits can be harvested at three different times.

- Normal Fruiting Schedule: Leave straw through early spring to have same production schedule as bare ground (recommended for all growers that don’t have frost protection.)
- Early Fruiting Schedule: Remove straw in the early spring to allow early growth and fruiting. Adding row cover can add an additional 5-7 days to earlier fruiting. Damage from frost is also possible!
- Late Fruiting Schedule: Leave straw over plastic until late spring to promote slower growth and late fruiting.

INCREASED YIELD – Average harvest efficiency can increase by 20% or more. Larger fruit, more fruit per plant, increased picking rate, and controlled timing of fruiting contribute to this increase.

HIGHER QUALITY FRUIT – Larger, sweeter, fruit, with less damage, is more attractive to buyers and PYO customers.

INCREASED SALES AND PROFITABILITY – We are experiencing consistent increases in sales of fruit every year.

“Combining all of the appropriate elements of plasticulture will lead to higher yield potentials, higher quality fruit, and increased revenue. Our system allows every grower the ability develop their own way of combining these elements. There is no one way that will work best for everyone.” - Tim Nourse

Meeting Market Place Demand

Growers looking to improve sales and market share have found that Plasticulture Strawberries are the answer. Competing in a Global Market Place gives our customers an opportunity to see what other regions are producing. California is a perfect example of a region where Growers continually strive to improve quality and flavor. Plasticulture has given Growers in the East the opportunity to compete head to head. June strawberries have always had a taste advantage, now they can compete with size of California berries.

Sweet Success

The success stories of plasticulture are numerous. Our customers have been accused of selling California berries because of the bigger sized berries. This past season our pick your own patrons we're filling containers with berries, like they did in the '70's and '80's, full to overflowing. Gross dollars per acre in our worst season 2006 were \$17,000, in our best season 2007 were \$33,000 for an average return of \$25,000. By giving all of our customers a better product, we have been rewarded with increased sales and profitability.