# Ultra-Niche Crops Series: Plasticulture Strawberries

Fact Sheet FS1259





## Cooperative Extension

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*Ultra-Niche Crops are defined as exceptionally high-value crops that can provide a significant source of income to the farmer while using minimal land area.*

Strawberry production can be a viable option for small acreage farmers because of the high value of the crop and the constant demand for fresh, local strawberries. Strawberries are a staple for American consumers, with the average American consuming almost eight pounds of strawberries per year.[1]

Strawberry plasticulture is a relatively new system of production for New Jersey. The plasticulture system has several advantages including high yields, good fruit quality, good weed control, and earlier harvests. Early harvests can help growers beat other farmers to the market and also help to sell other early season crops to customers. While the plasticulture system does have higher upfront costs, when done correctly, growers can often experience higher returns to offset those costs and create greater profits.

## Marketing

**Who will buy the crop?** Strawberries can be sold anywhere consumers choose to purchase produce. Direct marketing to consumers is optimal because wholesale market prices are low due to competition from other regions and consumers are often willing to pay more for locally grown and marketed strawberries.

**How suitable is this crop for agritourism?** Strawberries are an excellent crop to offer to customers as part of an agritourism operation and are also an exceptional choice for Pick-Your-Own (PYO) marketing.

**How well does this crop withstand shipping?** Strawberries which are allowed to ripen for maximum flavor are delicate and do not withstand shipping well. The berries need to be kept cool and they have a short (1–3 days) shelf-life when refrigerated.

### Farmer's Tool Box

**Essential Equipment/Supplies**

- ❒ Refrigeration (if not PYO)
- ❒ Tractor (30-50 hp)
- ❒ Bed maker
- ❒ Plastic layer
- ❒ Hand hoes (weed control between beds)
- ❒ Harvest containers
- ❒ Black plastic mulch
- ❒ Trickle tape or Drip tape and Lay flat
- ❒ Irrigation filtration system
- ❒ Sprayer (type depends on number of acres grown)

**Optional Equipment/Supplies**

- ❒ Transplanter
- ❒ Row cover

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**What packaging should be used?** Strawberries are harvested directly into consumer packages to minimize handling and damage to fruit, placed in flats for easier handling, and sold by container (volume, traditionally quarts) or by weight in non-standard containers.

## Crop Requirements

**Soil:** pH range 6.0–6.5, well-drained to prevent root diseases and avoid low, late frost-prone areas.

**Water:** One inch per week of high-quality water through natural rainfall or supplied via trickle irrigation, if necessary.

**Light:** Strawberries need full sun exposure (>8 hours/day).

**What is the number of frost-free days required to grow the crop?** Strawberries will grow throughout North America and need an average of 160 frost-free days in New Jersey.

**Is frost damage a common threat?** Since strawberries are such an early crop, frost is a threat during spring flowering.

The timeline for plasticulture strawberries in New Jersey is at the bottom of this page.

Note: Dormant crowns, which have been specially stored for a summer planting can be set into the field in June and July. Actively growing plug plants are transplanted into plasticulture beds in August and September. Both types of plants flower and fruit during the following spring and summer.

## Growing the Crop

**How are strawberry plants started?** Certified virus-free plugs or dormant plants should be purchased from commercial plant nurseries.

**How is this crop typically planted?** Plugs can be planted by hand or with a water-wheel transplanter tractor implement.

**How is the field prepared for planting?** Rows of raised beds with trickle irrigation under black plastic mulch.

**What is the optimal number of plants per acre?** A range of 15,000–17,424/A depending on the between-row spacing and within-row spacing.

**What is the general care and maintenance of the crop during the dormant season?** Floating row covers should be used to protect the plants from desiccation and severe temperature fluctuations.

**What is the general care and maintenance of the crop during the growing season?** Keep beds weed free and scout frequently for pests. Row covers should be used for frost protection. Make sure the row cover stays in place over the plants and is removed as soon as plants begin to flower to ensure pollination. Flowers can also be protected from frost with controlled use of sprinkler irrigation.

**How is harvesting performed?** Strawberries need to be carefully hand harvested when fully ripe. The fruit should be harvested by breaking the stem and leaving the calyx attached, and handled very carefully.

**When are strawberries harvested?** Fruit color changes from light pink to dark red when ready to harvest, exact color varies by variety.

**What are the postharvest cooling and washing requirements?** Strawberries need to be cooled immediately to 32–34°F at 90–95% humidity.

**What is typical yield in lbs./A at optimal spacing?** You can expect to get between 12,000–20,000 lbs./A the first and second spring after establishment.

## Considerations for Organic Production

**Can strawberries be grown organically?** Yes, cultivar selection, field location, weed control, and field sanitation are all important components of organic strawberry production. Organic growers will want to select varieties that will produce the type of berry desired, are adapted to the growing region, and that provide some disease resistance. 'Honeoye' and 'Mesabi' are varieties available from several wholesale sellers as certified organic transplants. Both of these strawberry varieties have performed well in Cornell University field trials.[2]

- Ideal previous crops to strawberries are those that have been intensively cultivated, such as lettuce or cole crops. This should reduce the weed populations in the newly planted strawberries.



- Continual management of weed populations throughout the growing season is important as weeds can negatively affect crop yield. Hand weeding is the most viable post-planting option of an organic crop. Flaming is an option for broadleaf weeds not growing in or near the plastic mulch. There are no Organic Materials Review Institute (OMRI) approved herbicides with consistent efficacy currently available.
- Field sanitation is an important tool in reducing disease in the crop. Purchasing certified plant material helps to ensure that strawberry diseases are not brought in with the transplants. The use of drip irrigation will help to keep leaves and fruit dry, discouraging the development of diseases. There are limited options for the control of diseases in organic strawberries. Should diseases appear in the crop, the removal and disposal of infected leaves and fruit should be a priority. This will help reduce the spread of the disease further in the field.

## Critical Considerations

- One of the biggest issues farmers need to consider when growing strawberries is the large amount of labor needed to harvest the crop. Strawberry harvest is labor-intensive and occurs during a short period in the late spring to early summer. Many growers address this concern by selling strawberries as Pick-Your-Own. Pick-Your-Own marketing works well if the farm is in a good location with nearby customers, and the grower is willing to invite the public onto the farm.
- If growers choose to market their strawberries off of the farm, great care must be taken in moving the berries because they are fragile and do not ship well. This fragile nature of strawberry fruit typically means selling locally at farm stands, farmer markets, and through Community Supported Agriculture (CSA) arrangements.
- After weeds, the major pest concern of strawberries is fungal diseases. These can be a challenge to manage in both conventional and organic production systems, especially in humid areas during wet springs. The farmer should scout fields regularly and be ready to implement chemical or mechanical control options.

## References


1. USDA Economic Research Service, Fruit and Tree Nuts Outlook No. (FTS-361) 41 pp, March 2016. www.ers.usda.gov/media/2054861/fts-361-revised.pdf
2. "Strawberry Variety Review", Cornell University. 3/6/12. www.fruit.cornell.edu/berry/production/pdfs/strcultreview2012.pdf


## Additional Information

"The Mid-Atlantic Commercial Berry Guide for Commercial Growers", a cooperative publication for Pennsylvania, Maryland, New Jersey, Delaware, West Virginia, and Virginia, contains additional information and can be found on the website:
extension.psu.edu/publications/agrs-097/view

"Organic Strawberry Production Manual." University of California. 2012.
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Success in the Field: Accomplishments of Phase II of the National Strawberry Sustainability Initiative 2014 – 2015
strawberry.uark.edu/NSSI_Phase_II_EBook_2015.pdf

"Production of Vegetables, Strawberries, and Cut Flowers Using Plasticulture", 2004. NRAES-133.
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"Mid-Atlantic Commercial Vegetable Production Recommendations" Published by Cooperative Extension in Delaware, Maryland, Rutgers, Pennsylvania, Virginia, and West Virginia.
njaes.rutgers.edu/pubs/publication.asp?pid=E001

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