

Plasticulture Strawberry Season and Market Extension Systems Field Research Studies 2012



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Plasticulture strawberry production is becoming more popular as a way for Ohio growers to extend the strawberry harvest and marketing season, thus capturing a great profit from the demand for local strawberry production. One of the main advantages of the system is a potential earlier harvest providing a competitive edge in the market place relative to conventional matted row production systems. Other potential advantages include higher yield and reduced environmental impact from a simpler pest management system; enhance food safety and fruit quality issues and reduced harvest labor costs due to increased harvesting efficiency. Challenges include: lack of experience with the system among growers, Extension personnel and researchers, production costs, winter protection techniques and adaptability of suitable varieties to Ohio's climate.

Objectives of research study:

These 2012 field research trials investigated potential season extension improvements in plasticulture strawberry production. Previous research has identified a functional and profitable system, but new variety testing (including day neutral/summer bearing varieties), new season extension techniques, and winter row cover management needs to be further explored and optimized to maximize grower financial returns.

Scope of Research:

Trials were established at the OSU South Centers/Piketon Research & Extension Center at Piketon, Ohio (lat. 39.07° N, long. 83.01° W, elevation 578 m). At each harvest yield data and fruit quality attributes were observed and recorded. Plant growth characteristics, fruit quality attributes, insect and disease susceptibility, and tolerance and winter injury percentages were monitored and recorded.

Methods:

Fall 2011 planting

Strawberry tips were stuck on August 8, 2011 into 50 cell plug trays containing Metro Mix 360 soilless media and placed on weed mat under mini wobblers during the month of August. Planting media was kept moist using an electronically timed misting schedule to promote root development. The resulting plugs were transplanted to the field on September 14, 2011 by hand and watered in with 20-20-20 water soluble starter fertilizer. Strawberry plants were planted in double rows with 12 inches between rows and plants. Field preparation included: application of 60 units of nitrogen, phosphorus, and potassium pre-planting, and formation of a raised bed. Chateau herbicide was applied prior to the bed being covered with black plastic and trickle irrigation under the mulch.

Beds were formed with a commercial bed shaper. The first of the floating row cover treatments were put in place on October 31st. The second floating row cover treatments were applied on January 10th. Plant growth was monitored and recorded throughout the winter. To control weed growth, annual rye grass was seeded between the rows of plastic prior to planting. The rye was killed off in the spring with an application of Poast EC at 2.5 pints / ac plus 2 pint of a crop oil concentrate. To control disease, a standard commercial fungicide program was followed. Calcium nitrate was injected through the drip tape beginning in early Spring and continued through harvest in an attempt to maintain optimum plant growth and berry fruit quality.

Spring 2012

A lack of availability of a sufficient number of quality day neutral plant cultivars prevented a 2012 spring planting however plants have been ordered and will be planted in trial spring of 2013.

Fall 2012

Strawberry tips were stuck on August 2, 2012 into 50 cell plug trays containing Metro Mix 360 soilless media and placed on weed mat under mini wobblers during the month of August. Planting media was kept continually moist using an electronically timed misting schedule to promote root development. The resulting plugs were transplanted to the field on September 5, 2012 and Albion cultivar was transplanted on September 6, 2012. Plug plants were obtained from the Rutgers University strawberry breeding program and were hand transplanted on September, 24, 2012. All plug plants were transplanted by hand and watered in with 20-20-20 water soluble starter fertilizer. Strawberry plants were planted in double rows with 12 inches between rows and plants. Field preparation included: application of 60 units of nitrogen, phosphorus, and potassium prior to formation of a raised bed. Chateau herbicide was applied prior to the bed being covered with black plastic and drip irrigation applied under the mulch. Beds were formed with a commercial bed shaper.

Outcomes & significance of outcomes:

The plasticulture strawberry industry is growing steadily in Ohio. An estimated 100 plus acres of Ohio plasticulture berries were planted in 2011 with many “new” growers planting throughout Ohio. These field experiments helped to continue reducing production risk, maximizing yields, and to improve grower financial returns by extending the harvest and marketing season. Due to earlier than normal high temperatures, the 2012 harvest began on April 25, 2012 and ended on May 25, 2012.

A plasticulture strawberry twilight meeting and field day were conducted on May 17, 2012 to showcase the field research trials, to share preliminary research results with growers and industry and to educate interested growers and Extension faculty and staff on plasticulture strawberry production techniques.

Table 1: Winter Protection Treatments.

Treatment Number	Row Cover Treatment applied
1	.9 ounce applied October
2	1.25 ounce applied October
3	.55 ounce applied October plus .55 ounce applied January
4	.9 ounce applied October plus .55 ounce applied January
5	1.25 ounce applied October plus .55 ounce applied January
6	1.25 ounce applied October plus .9 ounce applied January

Table 2: Winter Protection Treatment yield data

Treatment	Marketable lbs. per Acre	Marketable Fruit per Plant	Marketable lbs. per Plant	Average Fruit Weight (oz.)
4	17915	38.21	1.02	.43
1	15979	32.57	.91	.44
3	15442	31.60	.88	.44
2	13951	26.74	.80	.47
5	11802	25.53	.67	.42
6	11587	24.11	.66	.42
LSD	8588	16.05	.49	.05

Table 1: Cultivar Study yield data

Cultivar	Marketable lbs. per Plant	Marketable Fruit per Plant	Marketable lbs. per Acre	Average Fruit Weight (oz.)	Brix
Chandler	.64	22.20	11295	.46	4.25
Palomar	.48	10.86	8370	.71	5.62
Radiance	.46	12.32	8125	.60	5.32
Stella	.40	10.45	7080	.63	7.17
Camarosa	.39	11.65	6821	.52	6.87
Camino Real	.34	8.19	6027	.66	6.50
Albion	.31	6.80	5527	.72	7.87
LSD	.24	4.94	4195	.15	6.50