

2003-2004 Strawberry Plasticulture Winter Protection Study

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Plasticulture strawberry production is a relatively new innovation for Ohio growers. One of the main advantages of the system is a potentially earlier harvest providing a competitive edge in the market place relative to conventional matted row production systems. Another potential advantage is reduced environmental impact arising from a simpler pest management system. In certain settings there is the potential for higher yields relative to traditional matted row production systems. Challenges include: higher per acre cost, acclimation of suitable varieties to Ohio, and general lack of experience with the system among producers, researchers and Extension personnel.

This trial compared four winter protection methods: straw, 0.9 and 1.5 oz floating row cover, and a no-cover control.

METHODS:

Canadian nursery grown 'Chandler' strawberry tips, obtained from where Strawberry Hill Inc., Bunn NC, were planted in 50 cell trays containing Metro Mix 360 soilless media and placed in the greenhouse at Southern State Community College the first week of August. Tips were grown for four weeks with an average day temperature of 75 degrees F and an average night temperature of 65 degrees F. Planting media was kept continually moist with a mist system to promote root development. The resulting plugs were transplanted to the field (OSU Enterprise Center, Hillsboro) on September 12, 2003 using a three-point hitch water wheel planter and watered in with Peters 20-20-20 starter fertilizer. The soil is a Haubstadt Silt loam. Field preparation included pre-plant application of 60 units each of nitrogen, phosphorus, and potassium, plowing, disking. A raised bed was formed with a Redick Fumigation bed shaper and covered with black plastic mulch. Trickle irrigation tape was installed under the mulch. Strawberry plants were planted in double rows with 12 inches between rows.

The floating row cover was put in place on October 24th and removed on April 15th, 2004. The plant growth was monitored throughout the winter. To control weed growth between rows, annual rye grass was seeded prior to berry planting. The rye grass was then killed off in the spring with an application of Poast EC (sethoxydim) at 2.5 pints/ac + 2 pint of a crop oil concentrate. Weeds were manually removed in the spring around the planting holes and plants. A standard commercial fungicide program was followed to control disease.

Petiole nitrate levels were monitored and calcium nitrate injected through the trickle tape on April 19, 29, May 6, 13 and 20th to maintain optimum plant growth and berry production.

RESULTS:

There were statistically significant differences among treatments for marketable pounds per acre and marketable fruit per acre in the early harvest (Table 1) and total season (Table 2). Early yields ranged from 304 - 1702 lbs per acre and total season yields ranged from 2114 - 6364 lbs per acre.

Table 1. Early Harvest (May 11-May 21)

<u>Treatment</u>	Early Season Harvest	
	Marketable	Marketable
	<u>lbs./acre</u>	<u>fruit/acre</u>
Control	304	19965
Straw	389	26499
.9 oz. Cover	1702	91113
1.5 oz. Cover	969	47190

Table 2. Total Harvest (May 21 - June 7)

<u>Treatment</u>	Total Season Harvest	
	Marketable	Marketable
	<u>lbs. per Acre</u>	<u>Fruit per Acre</u>
Control	2114	117975
Straw	2214	128503
.9 oz. Cover	6364	323435
1.5 oz. Cover	5732	261362

DISCUSSION

The Winter of 03-04 was significantly colder than the Winter of 02-03, therefore we did see a yield advantage from covering the plants. If there would have been significant snow cover throughout the season this would have insulated the plants and helped prevent winter injury, desiccation and heaving, but as we all know this is Ohio and snowfall all winter is a very rare occurrence. Growing conditions during the Spring resulted some early season frost injury and heavy spring rainfall, this contributed to poor pollination conditions and fruit set, resulting in about half the yield from the 02-03 season .

Many growers have adopted plasticulture strawberry production technique on their farms, not as a replacement for the traditional matted row system of production but to complement their matted row crops. By beginning harvest up to 2 weeks earlier, this results in early marketing of the crop, which helps growers “get their foot in the door” earlier.

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