

## Strawberry Field Research Studies 2016

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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 2016 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, new season extension techniques and winter row cover management still need to be explored and optimized to maximize grower financial returns.

### Scope of Research:

This study was conducted at the Ohio State University (OSU) South Centers/Piketon Research & Extension Center at Piketon, Ohio (lat. 39.07° N, long. 83.01° W), elevation 578 feet. The experimental soil is designated as a DoA—Doles silt loam, with 0–3% slopes. It is a deep, nearly level and somewhat poorly drained soil. Typically, the soil surface is a brown, friable silt loam about 20 cm deep and beneath this the subsoil is about 18.5 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 2015 planting

Strawberry tips were stuck on August 14, 2015 into 50 cell plug trays containing Metro Mix 360 soilless media and placed on stone under mini wobblers during the month of August. Planting media was kept moist using a electronically timed misting schedule to promote root development. The resulting plugs were transplanted to the field on September 17, 2015 by waterwheel transplanter 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. After transplanting to the field three applications of calcium nitrate was applied through the drip tape at 5.25 pounds per acre was applied each fertigation. The first of the floating row cover treatments was put in place on November 16th. The second floating row cover treatments were applied January 6th. Plant growth was monitored and recorded throughout the winter. To control disease, a standard commercial fungicide program was followed. Calcium nitrate was injected through the drip tape beginning in early April and continued through harvest in an attempt to maintain optimum plant growth and berry fruit quality.

### Outcomes & significance of outcomes:

The cultivar evaluation study looked at seven strawberry cultivars. Total marketable pounds ranged from 6510 lbs. (Festival) to 7084 lbs. (San Andreas). Marketable fruit per plant ranged from 4.74 fruit (Albion) to 19.97 fruit (Chandler). Average fruit weight ranged from .53 oz. (Sweet Charlie and Festival) to .79 oz. (San Andreas).

The winter protection study looked at seven different floating row cover treatments to protect the crop during the winter months. Total marketable pounds ranged from 13,317 lbs. (1.2 plus .6) to 18,503 lbs. (.6 plus .6). Marketable fruit per plant ranged from 25.33 fruit (1.2 plus .6) to 33.6 fruit (.6 plus .6). Average fruit weight ranged from .58 oz. (1.0 alone) to .609 oz. (.6 plus .6).

The matted row cultivar evaluation study looked at seven cultivars. Total marketable pounds ranged from 4,484 lbs. (Laurel) to 10,688 lbs. (Sonata). Average fruit weight ranged from .32 oz. (Earliglow) to .46 oz. (Mayflower).

A plasticulture strawberry twilight meeting and field day was conducted on May 25, 2016 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: Yield's from 2016 cultivar evaluation

<i>Cultivar</i>	<i>Pounds per Acre</i>	<i>Pounds per Plant</i>	<i>Fruit per Plant</i>	<i>Average Fruit Weight (oz.)</i>
<i>San Andreas</i>	7084.8 A	0.48794 A	10.267 CD	0.7987 A
<i>Benecia</i>	6833.1 AB	0.4706 AB	13.678 BC	0.77144 A
<i>Albion</i>	6663.9 AB	0.45895 AB	4.742 D	0.75145 A
<i>Camino Real</i>	6510.3 AB	0.44837 AB	11.675 C	0.71739 AB
<i>Camarosa</i>	6510.3 BC	0.40179 BC	20.9 A	0.64286 B
<i>Chandler</i>	6510.3 CD	0.34104 CD	19.975 AB	0.57226 CD
<i>Sweet Charlie</i>	6510.3 D	0.31473 D	7.25 CD	0.53263 D
<i>Festival</i>	6510.3 D	0.30701 D	10.932 CD	0.53263 D
<i>LSD</i>	1153.4	0.0794	6.437	0.1009

. \*Treatments with the same letters are not significantly different



Table 2: Yields from 2016 Matted Row cultivar evaluation

<i>Cultivar</i>	Pounds per Acre	Average Fruit Weight (oz.)
<i>Sonata</i>	10688 A	0.43718 AB
<i>Mayflower</i>	9860 A	0.46925 A
<i>Galletta</i>	9678 A	0.41361 AB
<i>Earliglow</i>	9593 A	0.32839 C
<i>Jewel</i>	7770 AB	0.45932 A
<i>Rubicon</i>	6448 AB	0.46514 A
<i>Laurel</i>	4484 B	0.37281 BC
<i>LSD</i>	4939.6	0.0829

\*Treatments with the same letters are not significantly different

Table 3: Yields from 2016 Winter Protection Study

<i>Treatment</i>	Pounds per Acre	Pounds per Plant	Fruit per Plant	Average fruit Weight (oz.)
4	18503 A	1.2743 A	33.6 A	0.60907 A
7	16393 A	1.129 A	31.888 A	0.57537 A
5	15850 A	1.0916 A	29.5 A	0.59134 A
2	14939 A	1.0289 A	26.625 A	0.62443 A
3	14722 A	1.0139 A	28.1 A	0.60108 A
1	14333 A	0.9871 A	26.825 A	0.58624 A
6	13317 A	0.9172 A	25.533 A	0.596 A
<i>LSD</i>	5193.6	0.3577	11.892	0.0893

\*Treatments with the same letters are not significantly different

Table 4: Winter Protection Treatments

<i>Treatment</i>	Floating Row Cover Treatments
1	1.0 Alone applied October
2	1.2 Alone applied October
3	1.2 October + 1.0 January
4	.6 October + .6 January
5	1.0 October + .6 January
6	1.2 October + .6 January
7	1.0 Row Cover + Straw





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