

Strawberry Field Research Studies 2017

Brad R. Bergesford, Horticulture Specialist and Extension Educator, South Centers
Thomas Harker, Horticulture Research Assistant, South Centers
Ryan Slaughter, Horticulture Research Assistant, South Centers
Wayne Lewis, Farm Manager, South Centers

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 2017 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 2016 planting

Strawberry tips were stuck on August 17, 2016 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 22, 2016 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. Prowl H20 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 two applications of calcium nitrate was applied through the drip tape 5.25 pounds was applied each fertigation. The first of the floating row cover treatments was put in place on December 8th. The second floating row cover treatments were never applied do to the warm temperatures after the first of the year. 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 235 lbs. (White Carolina) to 12,460 lbs. (Camarosa). Marketable fruit per plant ranged from 1.65 fruit (White Carolina) to 24.82 fruit (Camarosa). Average fruit weight ranged from .094 oz. (White Carolina) to .71 oz. (Scarlet).

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 19,857 lbs. (1.0 alone) to 25,840 lbs. (.6 plus .6). Marketable fruit per plant ranged from 39.90 fruit (1.0 alone) to 52.82 fruit (.6 plus .6). Average fruit weight ranged from .47 oz. (1.2 plus .6) to .53 oz. (1.2 plus 1.0).

The matted row cultivar evaluation study looked at seven cultivars. Total marketable pounds ranged from 4394 lbs. (Laurel) to 11,875 lbs. (Sonata). Average fruit weight ranged from .32 oz. (Earliglow) to .429 oz. (Mayflower).

The day neutral cultivar evaluation study looked at three cultivars harvested spring and summer. Spring total marketable pounds ranged from 5378 lbs. (Albion) to 8541 lbs. (Sweet Ann). Marketable fruit per plant ranged from 8.56 fruit (Albion) to 11.39 fruit (Sweet Ann). Average fruit weight ranged from .51 oz. (San Andreas) to .82 oz. (Sweet Ann). Summer total marketable pounds ranged from 289 lbs. (Sweet Ann) to 2198 lbs. (San Andreas). Marketable fruit per plant ranged from 1.93 fruit (Sweet Ann) to 6.8 fruit (San Andreas). Average fruit weight ranged from .011 oz. (Sweet Ann) to .020 oz. (San Andreas).

A plasticulture strawberry twilight meeting and field day was conducted on May 25, 2017 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 from Cultivar Evaluation 2017.

<i>Variety</i>	<i>Fruit per Plant</i>	<i>Pounds per Plant</i>	<i>Pounds per Acre</i>	<i>Average Fruit Weight (oz.)</i>
<i>Camarosa</i>	24.825 AB	0.80094 A	12460 A	0.52064 C
<i>Chandler</i>	28.806 A	0.72956 AB	11350 AB	0.41639 DEF
<i>Flavor Fest</i>	20.575 BC	0.62759 AB	9763 AB	0.48535 CDE
<i>Sweet Ann</i>	11.133 DEF	0.56822 BC	8840 BC	0.81109 A
<i>Festival</i>	11.764 DE	0.38973 CD	6063 CD	0.51095 CD
<i>Camino Real</i>	15.733 CD	0.38709 CD	6022 CD	0.39571 EF
<i>Sweet Charlie</i>	16.997 CD	0.35933 DE	5590 DE	0.34062 F
<i>San Andreas</i>	11.714 DE	0.35483 DE	5520 DE	0.47983 CDE
<i>Lucia</i>	8.858 EFG	0.3092 DE	4810 DE	0.56493 C
<i>Scarlet</i>	4.95 FGH	0.22365 DE	3479 DE	0.71675 AB
<i>Albion</i>	5.508 EFGH	0.18031 EF	2805 EF	0.48273 CDE
<i>Ruby Red</i>	3.922 GH	0.16278 EF	2532 EF	0.66541 B
<i>White Carolina</i>	1.653 H	0.01508 F	235 F	0.14908 G
<i>LSD</i>	6.333	0.2008	12460	0.0947

***Treatments with the same letter are not significantly different.**

Table 2: Yield from Day Neutral Evaluation Spring Harvest 2017.

<i>Variety</i>	<i>Fruit per Plant</i>	<i>Pounds per Plant</i>	<i>Pounds per Acre</i>	<i>Average Fruit Weight (oz.)</i>
<i>Sweet Ann</i>	11.394 A	0.54902 A	8541 A	0.82004 A
<i>San Andreas</i>	12.903 A	0.42369 A	6591 A	0.5126 B
<i>Albion</i>	8.565 A	0.34571 A	5378 A	0.64625 B
<i>LSD</i>	6.0131	0.2187	3402	0.1572

***Treatments with the same letter are not significantly different.**

Table3. Yields from Day Neutral Evaluation Summer Harvest 2017.

<i>Variety</i>	<i>Fruit per Plant</i>	<i>Pounds per Plant</i>	<i>Pounds per Acre</i>	<i>Average Fruit Weight (oz.)</i>
<i>San Andreas</i>	6.8 A	0.14134 A	2198.8 A	0.020726 A
<i>Albion</i>	6.275 A	0.1216 A	1891.8 A	0.018126 A
<i>Sweet Ann</i>	1.933 A	0.0186 A	289.4 A	0.011013 A
<i>LSD</i>	6.8974	0.1523	2369.2	0.0109

***Treatments with the same letter are not significantly different.**



Table 4: Yields from Matted Row Cultivar Study 2017.

<i>Variety</i>	<i>Pounds per Acre</i>	<i>Average Fruit Weight (oz.)</i>
<i>Sonata</i>	11875 A	0.40901 A
<i>Laurel</i>	4394 D	0.36866 AB
<i>Galletta</i>	5804 CD	0.42584 A
<i>Earliglow</i>	7459 BCD	0.32668 B
<i>Rubicon</i>	8830 ABC	0.4202 A
<i>Jewel</i>	9648 AB	0.39184 AB
<i>Mayflower</i>	9793 AB	0.42941 A
<i>LSD</i>	3674.5	0.069

***Treatments with the same letter are not significantly different.**

Table 5: Yields from Winter Protection Study 2017.

<i>Treatment</i>	<i>Fruit per Plant</i>	<i>Pounds per Plant</i>	<i>Pounds per Acre</i>	<i>Average Fruit Weight (oz.)</i>
1	39.906 A	1.2764 B	19857 B	0.5151 A
2	42.1 A	1.346 AB	20939 AB	0.51759 A
3	46.025 A	1.536 AB	23896 AB	0.5367 A
4	52.825 A	1.661 A	25840 A	0.50672 A
5	44.036 A	1.376 AB	21407 AB	0.50297 A
6	45.903 A	1.3643 AB	21224 AB	0.47621 A
7	41.863 A	1.2777 B	19877 B	0.5002 A
<i>LSD</i>	13.531	0.3527	5486.6	0.0606

***Treatments with the same letter are not significantly different.**

Table 6: Winter Protection Treatments.

<i>Treatment</i>	<i>Floating Row Cover Treatments</i>
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





THE OHIO STATE UNIVERSITY

For more information, contact:

Brad Bergefurd

OSU South Centers

1864 Shyville Road

Piketon, Ohio 45661

bergefurd.1@osu.edu



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COLLEGE OF FOOD, AGRICULTURAL,
AND ENVIRONMENTAL SCIENCES

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