

Evaluating and Promoting Low-Input Strawberry Cultivars for the Residential Market.

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Objective:

To update strawberry cultivar recommendations for the homeowner market with those that are readily available, disease resistant, and productive.

Public Abstract:

A factor that differentiates strawberry production in low-input and home settings from commercial ones is the desire to extend production later in the season and grow plants as perennials rather than annuals. This makes heat tolerance and perennial vigor important considerations for those systems. Albion, Chandler, Charlotte, Éclair, Mara des Bois, Purple Wonder, and Seascape were evaluated in a replicated trial in North, South and Central Louisiana for their potential for perennial production. Éclair showed the best potential for perennial use followed by Charlotte, Mara des Bois, and Seascape. Albion and Purple Wonder would require intensive management to be successful in a perennial system. Chandler is better suited for annual production.

To expand the search for regionally adapted cultivars, twenty-four strawberry varieties were grown in the Spring of 2021. Cultivars screened were Cardinal, Deliz, Dickens, Eversweet, Evie-2, Galletta, Gasana, Lip Stick, Malwina, Mayflower, Montana, Pink Pagoda, Portola, Rosy Belle, Ruby Ann, Scarlet Belle, Snowy Belle, Sweet Kiss, Sweet Sensation, Tochtome, Toscana, Tristian, Wiese Anasa, and Yambu. Dickens, Galletta, Sweet Sensation, and Yambu showed enough promise to warrant potential future study. Weise Anasa showed potential as a novelty white strawberry. Gasana was the only ornamental strawberry that showed perennial potential.

Justification and Description:

There is significant interest in growing fruit at home among the public. A subset of experienced home gardeners is very comfortable growing a large assortment of fruit crops like peaches, apples, and related commodities that often require specialized growing practices and maintenance programs. Conversely, there is an even larger portion of the population that is interested in growing fruit crops, but these individuals lack the level of experience to be comfortable with those that require a scheduled pruning and maintenance program. Strawberries are a great compromise for the novice gardener, because with a little bit of effort and instruction it is possible to have a successful planting

A factor that differentiates strawberry production in a home setting from a commercial one is the desire of many homeowners to extend production later in the season and grow plants as perennials rather than annuals. For a homeowner, heat tolerance and perennial vigor become important considerations. Additionally, availability of plant material is critically important. A survey of recommended cultivars for homeowners in the region (Figure 1) shows that they are either current commercial recommendations or ones that have become rare. Commercial cultivars can be difficult to source in smaller quantities for smaller growers and homeowners. With those factors in mind, a preliminary study in Central Louisiana was started in Spring of 2020 to evaluate strawberry cultivars that would be easily accessible to a homeowner.

These were the preliminary results from 2020 before the grant was received:

Eliminated Cultivars: Allstar, Ozark Beauty, Proven Winners Berried Treasure® Red, Ruby Ann*, Quinault, Sweet Charlie, and Tristan. Cultivars removed from the study either had poor heat tolerance, disease susceptibility or unacceptable fruit quality.

Cultivars proposed to be upgraded to replicated trial: Albion, Eversweet, Mara des Bois, and Seascape. These cultivars have performed well and are readily available.

Cultivars with potential: Deliz*, Gasana, and Purple Wonder. These cultivars have performed well but retail availability is limited.

*In the grant proposal these two cultivars were switched in error.

Materials and Methods:

Strawberry Evaluation Set-up

The structure used to evaluate strawberry cultivars prior to grant funding in Forest Hill; Louisiana was focused on container production (Figure 2). It was decided to grow in substrate container-based structures in North, South (Figure 3) and Central (Figure 4) Louisiana. The improved accessibility made evaluation of the cultivars much easier and

reduced disease pressure through improved airflow. Recorded information included plant vigor, heat, tendency to produce runners, susceptibility to foliar diseases flavor, yield, and perennial potential.

Plant Material

Bare root plants of Albion, Chandler, Charlotte, Éclair, Mara des Bois, Purple Wonder, and Seascape were acquired in the Fall of 2020 in anticipation of grant funding. These were the cultivars chosen for multisite replication. On March 15, 2021, 18 of each cultivar were sent to the replication sites in South and North Louisiana except for Charlotte and Purple Wonder, of which, only 6 of each were available for each of those locations.

After funding was received, additional Charlotte and Purple Wonder were acquired for the Central Louisiana Site. The Central Louisiana location was also used to screen cultivars for potential future replication. Cultivars screened in the Spring 2021 growing season were: Cardinal, Deliz, Dickens, Eversweet, Evie-2, Galletta, Gasana, Lip Stick, Malwina, Mayflower, Montana, Pink Pagoda, Portola, Rosy Belle, Ruby Ann, Scarlet Belle, Snowy Belle, Sweet Kiss, Sweet Sensation, Tochtome, Toscana, Tristian, and Wiese Anasa.

Grant Project Results:

Grant Outreach

We were able to create eleven YouTube videos about strawberry cultivation over the course of the grant. We plan on making cultivar highlight videos on plants that are still performing well in year two (screened) and three (some replicated) next spring. An in-person training event was not possible due to Covid-19 restrictions.

LSU AgCenter Central Region YouTube Videos:

Strawberry Project Update: <https://www.youtube.com/watch?v=jONNHbmsrQ>

Bare Root Strawberries: <https://www.youtube.com/watch?v=bqI-gMW1z-I&t=73s>

Summer Strawberry Pruning: <https://www.youtube.com/watch?v=5OSSjvlPC5s&t=1s>

Summer Strawberry Pruning How To: https://www.youtube.com/watch?v=SUM_VB-5ku4

Summer Strawberry Propagation: <https://www.youtube.com/watch?v=MKpXXj-Fw9g&t=25s>

LSU AgCenter YouTube Videos:

LSU AgCenter Strawberry Study: <https://www.youtube.com/watch?v=Lh5TTbqClzk>

Louisiana Strawberries: https://www.youtube.com/watch?v=h9_IuPMCYwo

LSU AgCenter Northeast Region Horticulture YouTube Videos:

Planting Strawberries: <https://www.youtube.com/watch?v=CEMlBMcXXOA>

Ornamental Strawberries: <https://www.youtube.com/watch?v=dVr9oNttt4E>

Growing Strawberries in Containers: <https://www.youtube.com/watch?v=sIIx1F36c7k>

Caring for Your Strawberries: <https://www.youtube.com/watch?v=oD9rFA32Dn8&t=2s>

Summary of 2021 Replicated Variety Trail and Screening Results:

Replicated Variety Trail

Éclair was found to be the best cultivar for perennial use in low input and residential settings. Charlotte, Mara des Bois, and Seascape would perform well as a perennial in those settings as well. While Purple Wonder grew well, at its current price point we would be hesitant to recommend it. Albion and Chandler did not perform well in a perennial system in our climate using low input and residential management techniques. With more intensive Albion might work as a perennial but Chandler would be best grown in as an annual.

Screened Cultivars

Of the cultivars screened, only Dickens, Galletta, Sweet Sensation, and Yambu showed enough promise to warrant potential future study. Weise Anasa showed potential as a novelty white strawberry. Gasana was the only ornamental strawberry that showed perennial potential.

Replicated Variety Trail Results:

Albion

Plant vigor: Low, plants grow much slower than other cultivars.

Heat tolerance: Medium to High, variable depending on plant size and vigor. Larger and healthier plants fair well but weak plants are prone to heat stress and loss.

Tendency to produce runners: Medium, tends to produce runners several times in the production season that need to be removed to focus on fruit production.

Susceptibility to foliar diseases: Susceptible, can reduce vigor in some plants.

Flavor and Yield: Good flavor, with a firm fruit. Yield can be acceptable for home production in established plants.

Perennial Potential: Low to Medium, once plants are established the survivability from year to year is average. Plants struggle to get to establishment in a home management setting. Runner production is prolific enough to produce replacement plants with proper planning.

Notes: Albion was the worst performer in terms of plant vigor and health. Flavor and yield are fair enough to redeem the cultivar. It may not be the best plant for the average home gardener.

Chandler

Plant vigor: Low to Medium, less than average plant size and growth.

Heat tolerance: Medium

Tendency to produce runners: Medium, runner production tends to be concentrated in two points of the growing season – limited in late Spring/early Summer and excessive runner production in Fall.

Susceptibility to foliar diseases: Medium

Flavor and Yield: Acceptable flavor but poor yield in a Spring planting

Perennial Potential: Poor, better suited for annual production

Notes: Chandler was the second worst performer in terms of plant vigor and health, behind Albion.

Charlotte

Plant vigor: Medium, average plant size and growth

Heat tolerance: Excellent, a majority of plants fared well under heat stress

Tendency to produce runners: Low to Medium

Susceptibility to foliar diseases: Mildly susceptible, not enough to reduce plant vigor.

Flavor and Yield: Good flavor. Low to Medium yield of small to medium sized berries.

Perennial Potential: High, plants survive the summer well and produce enough runners to replace lost plants.

Notes: Due to a delay in shipping of the plants to the Central Louisiana site (April), a true season long replication was not performed. Those plants were not very well developed going into the summer but still had a good survival rate. This cultivar is worth continued study. Misshapen fruit due to poor pollination frequent enough to be noted.

Éclair

Plant vigor: Very High, plants were up to 25 to 50 percent bigger than other selections.

Heat tolerance: Excellent, a majority of plants fared well under heat stress.

Tendency to produce runners: High, runners need to be removed during the production season to focus on fruit production.

Susceptibility to foliar diseases: Low, nothing significant noted other than older foliage looking rough at the end of the season

Flavor and Yield: Makes large sized berries with good flavor. Yield potential high under home management techniques.

Perennial Potential: High, vigorous plants that survive the summer well. Can be sensitive to summer pruning if done with too much gusto. Produces enough runners to replace missing plants.

Notes: This cultivar was the standout in our study. It was the consistent favorite in plant vigor and fruit production. Overall, this cultivar would be an excellent recommendation to a homeowner.

Mara des Bois

Plant vigor: Medium, plants establish themselves quickly and then level off in size.

Heat tolerance: Excellent, when established.

Tendency to produce runners: Medium, late season it can be prolific but tend to be isolated to that time.

Susceptibility to foliar diseases: Low, nothing significant noted other than older foliage looking rough at the end of the season.

Flavor and Yield: Excellent Flavor, consistently one of the highest ranked in that regard. Medium yield of small to medium sized berries. Makes fruit throughout the year in small waves, would need to have a large number of plants to make consistent production. Acceptable for home production.

Perennial Potential: Excellent. Plants get established quickly. They have high heat and disease resistance. Enough runners are produced to replace missing plants.

Notes: Though plants get established fairly quickly, it is possible to plant too late and not have good heat tolerance. A batch of plants was set aside and planted late. That batch had about 50% survivability compared to the 80 to 90 % of the established planting. Overall, this cultivar would be a good recommendation to a homeowner.

Purple Wonder

Plant vigor: Medium, better vigor than Albion. Should be planted as early as possible since it can be slower to establishment than other cultivars.

Heat tolerance: Medium to High, Variable depending on plant size and vigor. Larger and healthier plants fair well but weak plants prone to heat stress and loss.

Tendency to produce runners: Low, Produces very few to no runners.

Susceptibility to foliar diseases: Low, nothing significant noted other than older foliage looking rough at the end of the season

Flavor and Yield: Flavor is excellent and noted for being one of the favorites in taste tests. Yield is low and may not be enough to justify the effort for the average home gardener.

Perennial Potential: Medium, once plants are established, they tend to be healthy and survive heat well. Establishment can be an issue. Plants sourced from Burpee can be very small and slow to establish.

Notes: We acquired plants from two different sources. The ones from Burpee in the Spring of 2021 were small and slow to establish. Ones from an Etsy seller in Fall of 2020 had more time to establish and had better summer survivability. As of Fall of 2021 Burpee has started offering these in the Fall which would be a better time to acquire them. Cost is very expensive per plant and will be a barrier to most home gardeners. May be worth it to a dedicated home gardener but not to the average one. Plants were not pruned over the summer like others since they were smaller and still had decent foliage at the time. Could have market potential grown with higher inputs in locations where intense flavor can fetch a premium price.

Seascape

Plant vigor: Medium, plants establish themselves at expected time points in the growing season.

Heat tolerance: Medium, plants do well once established.

Tendency to produce runners: Medium, runner production tends to be concentrated in two points of the growing season – late Spring/early Summer and again in Fall.

Susceptibility to foliar diseases: Low to medium, some plants do occasionally get leaf spot.

Flavor and Yield: Flavor can be tart early in the season but becomes sweeter later on as plants develop and fruit has longer to ripen. Yield is average and acceptable to home production standards.

Perennial Potential: Medium to High, can occasionally have losses. Enough runners can be produced to replace missed plants.

Notes: Caution needs to be taken with summer pruning. It can respond negatively and die if pruned too harshly. Overall, this felt like to most average berry grown. It can be a good plant for homeowner production since it is one of the easiest ones to acquire from multiple sources.

Screened Cultivars in Spring of 2021 Results:

Cardinal*

Average to low vigor. Poor heat tolerance. Lackluster yield. Eliminated.

Deliz*

This was the second year for this cultivar. Poor vigor. Average heat tolerance of established but can decline in second year. Eliminated.

Dickens

Average vigor. Average yield for a home cultivar. Excellent flavor, reminiscent of Purple Wonder. Above Average heat tolerance. Occasional leaf spot but not too much. Worth looking at further

Eversweet

This was the second year for this cultivar. Poor vigor, the plants were almost miniature. At first, I thought this might be positive for container production. Excellent heat tolerance the first year which was enough to look at further but very poor the second. Poor yield and flavor. Eliminated.

Evie-2

Average to high vigor. Average to high yield. Fruit is tart at first, it sweetens later in the season but not very much. Thought it would still be worthwhile to look at further, but heat killed 75% of the plants. Eliminated.

Galletta

Average vigor. Average yield with an average flavor the first year. Tends to want to produce runners throughout the season that need to be removed. Occasional leaf spot but not too much. Above average heat tolerance. Worth looking at further.

Malwina

High vigor, with rapid dense growth. Produces runner readily that need to be removed throughout the season. Leaf spot present enough to be noted. Flavor good, fruit large,

yield slightly below average. Vivipary occurred in fruit often enough to be noted and was a contributor to lower yield.

Mayflower

Average vigor, yield flavor, and runner production. Slightly below average heat tolerance Occasional leaf spot but not too much. As of writing, the cultivar is being grown for a second year. Expected elimination and would remove to look at another cultivar if the opportunity arises.

Portola

Very poor vigor. 90% loss even before heat exposure. Eliminated.

Sweet Kiss

Very poor vigor. Bare roots were not in the best shape upon arrival and were shipped a bit later in the season. 90% loss. Surviving plants are still being grown to determine if it was an issue with initial plants.

Sweet Sensation

Ordered from the same company as Charlotte and had the same issue with extremely late arrival. Plants did not have much time to establish before the heat of the summer. Had remarkable heat tolerance for their size with minimal loss. Worth further study.

Tochitome*

Average to low heat tolerance. Flavor and yield below average. Eliminated.

Wiese Anasa*

Above Average heat tolerance and vigor. Yield is low to slightly above average. Remarkable for being a white strawberry. Yield and flavor were much better than the pineberries in my collection. Yield was likely reduced as I was propagating runners throughout the season as they were produced. Worth looking into further as a productive novelty plant.

Yambu

Above average plant vigor and heat tolerance. Good yield. First wave of berries was tart but the second wave on were sweet. Low incidence of leaf spot. Runner production average and concentrated late in the season. Worth further study.

*Indicates that screened cultivar was with limited plant material

Ornamental Cultivars:

- Gasana
- Lip Stick
- Pink Pagoda

- Rosy Belle
- Ruby Ann
- Scarlet Belle
- Snowy Belle
- Toscana
- Tristian

All the ornamental selections with the exception of Gasana died in the heat of the summer. Gasana survived but with less vigor than it had the previous year. So far it is the only ornamental strawberry that has performed well. Flowers are pink, yield is average. Flavor is slightly below average.

Figure 1: Current Recommended Strawberry Cultivars for the Home Gardener in the Southern United States.

Alabama (2002)

Allstar
Cardinal
Chandler
Delite
Earliglow
Scott
Titan

Louisiana (2014)

Benicia
Camarosa,
Camino Real
Chandler
Festival
Sweet Ann

Arkansas &

Tennessee (2006)

Cardinal
Delmarvel
Earliglow
Lateglow
Latestar
Noreaster

Mississippi (2015)

Cardinal
Comet
Dixieland
Douglas
Florida 90
Pocahontas
Sunrise
Tangi
Tennessee Beauty

Georgia (2015)

Allstar
Camarosa
Chandler
Delmarva
Earliglow
Sweet Charlie

Traditionally grown:

Albritton
Cardinal
Delite
Tioga,
Apollo

South Carolina (1999)

Albritton
Apollo
Cardinal
Chandler
Delite
Douglas
Earliglow
Florida 90
Sunrise
Surecrop
Tioga

North Carolina (2018)

Albion
Chandler
Galletta
Jewel

Virginia (2016)

Camarosa
Camino Real
Chandler
Flavorfest
Sweet Charlie

Figure 2: Tiered Bench System for Screening and Evaluating Strawberries in Central Louisiana.



Figure 3: Bucket growing system and Greenstalk towers are the South Louisiana growing location



Figure 4: Tiered Bench System, Greenstalk towers, and Garden Tower Project grow structures at the Central Louisiana location.



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