Cornell Cooperative Extension
Eastern NY Commercial Horticulture Program

The Effects of using Plastic Mulches compared to Bare Ground Raised Ridges and Variety Selection on the Yield and Quality of Sweet Potato Roots 2023 Annual Report

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Summary:
Variety Trial: Sweet potato growers across the Eastern NY region of NY and across the state continue to struggle with determining which sweet potato varieties will do best under our climatic conditions and shorted growing season compared to southern grown sweet potatoes. Determining which varieties can provide the most consistent and greatest percentage of roots within the ½ pound to 1.5 pound category (the targeted root size for marketable roots) has proven difficult. In addition, growers are also interested in finding new, novelty varieties such as purple skin, purple fleshed varieties to diversify their marketing options even further. For these reasons, this project evaluated 13 varieties of sweet potatoes during the 2023 growing season to determine the impact on overall yield and root quality. Of these 13 varieties, several orange skinned, orange fleshed varieties rose to the top including Beauregard B-14, Covington and Averre and two purple skinned purple flesh varieties that are Purple Splendor and Purple Majesty.

Plastic Mulch versus Bare Ground Raised Ridges: The second research question to be asked in regards to producing the highest percentage of marketable sweet potato roots within that ½ - 1.5 pound size category was determining if growing them on plastic mulch or in bare ground raised ridges impacted overall yield and quality of roots. In 2022 trials, producing sweet potato roots grown with plastic mulches increased overall yield and larger roots compared to bare ground and the same was true for 2023.

Key Findings:

- Averre grown on plastic mulches produced significantly higher yields of Large and Jumbo sweet potato roots followed by LSU 18-100.
- Beauregard B-14 produced significantly higher yields of Large and Jumbo roots compared to the other varieties in bare ground raised ridges.
- Overall, plastic mulches produced higher total yields compared to bare ground and also higher number of Large and Jumbo roots compared to bare ground.
- Purple Majesty and Purple Splendor, both purple skin purple fleshed varieties produced acceptable yields and decent root qualities for this type of sweet potato.

Background:
Sweet potatoes continue to gain popularity with growers not only in eastern NY, but also across the whole state. Sweet potatoes offer growers that provide winter CSA shares or that participate in winter farmers' markets with an additional offering due to their ability to store for long

periods of time without losing quality. Like many other vegetable crops, new sweet potato varieties are being released routinely, but the focus is still on varieties for southern United States production. Recently however, there has been movement in the breeding for shorter season varieties, especially by Canadian breeders and researchers. Unfortunately, those varieties being developed in Canada have been slow to be released in the United States.

The other desire of sweet potato growers is to have something unique or different from the typical southern orange-reddish skinned, orange fleshed root, that would provide a new marketing opportunity. This has led to the introduction of several purple skinned purple fleshed varieties on the market. Even though purple skin purple fleshed sweet potatoes is not new, the varieties available did not have the best marketable yield or even the desirable sweet potato shape. In this trial we were able to compare two of these releases, Purple Majesty and Purple Splendor side by side.

Even though we provided statistical evidence in last year's mulch versus bare ground raised ridges production trial, there continues to be debate on the economic costs and value of using black plastic mulches compared to bare ground sweet potato production. Many growers use black plastic mulches to produce their sweet potatoes however, there are still a number of growers that do not use mulches and plant their sweet potatoes on bare ground. This year we were able to evaluate multiple varieties on both plastic mulches and bare ground to answer the questions of 1.) does using plastic mulch increase marketable yield and 2.) if we aren't going to continue to use bare ground, are there varieties that might perform better.

Materials and Methods:

Requests for new or newer sweet potato varieties were sent out to breeders, Dr. Craig Yencho at the University of North Carolina and Dr. Don Labonte from Louisiana State University as well as Jones Family Farm, one of the main slip suppliers for NYS. Along with those variety requests, Chuck Bornt had discussions with several sweet potato growers in the region of what sweet potato varieties they were using with success and those they had heard of but maybe had not tried yet or maybe didn't have the time to do their own variety trials with. In the end we ended up with 13 varieties from 4 different sources that can be found below in Table 1.

Table 1: Name and Slip Sources for Sweet Potato Variety Trial

Variety	Source	Skin Color	Flesh Color		Variety	Source	Skin Color	Flesh Color
Bayou Belle	Jones FF	Orange	Orange		Radiance[1]	LSU	Orange	Orange
Beauregard B-14	Jones FF	Orange	Orange		Vermillion[1]	LSU	Orange	Orange
Bellevue	Jones FF	Orange	Orange		Averre[2]	NC State	Orange	Orange
Covington	Jones FF	Orange	Orange		LSU 18-100[1]	LSU	Orange	Orange
Murasaki	Jones FF	Reddish-purple	White		Purple Majesty[2]	NC State	Dark Purple	Dark Purple
NC 122	Jones FF	Maroon	Orange		Purple Splendor[2]	NC State	Dark Purple	Dark Purple
Orleans	Jones FF	Orange	Orange					

[1]LSU 18-100, Radiance and Vermillion slips were provided courtesy of Don R. La Bonte, School of Plant, Environmental, and Soil Sciences, Louisiana State University AgCenter

[2]Averre, Purple Splendor and Purple Majesty were provided courtesy of Dr. Craig Yencho and Ken Pecota, North Carolina State University.
[3]Covington, Bellevue, Orleans, NC 122, Murasaki, Beauregard B-14 and Bayou Belle were purchased from Jones Family Farm, Bailey, North Carolina.

Slips of the 13 varieties arrived from all sources on June 9, 2023 and were removed from their shipping boxes, spread out and placed in open crates until they could be planted. Field preparation including all tillage, fertility and plot preparation was completed by HVFH staff. On June 12, 2023 4 replications of each variety were planted by hand by CCE ENYCHP staff in plastic mulched beds. Due to a lack of slips provided, Averre, LSU 18-100, Purple Splendor and Purple Majesty were only planted in the plastic mulch treatments. All other varieties' were planted in both plastic mulches and bare ground raised ridges. The plastic mulched beds were approximately 4-6" tall and 30" wide on 6.0' center spacing with two rows of slips planted in a double staggered row 12" apart. The bare ground ridges were 12" high, 4" wide on top and on 30" centers, with one row planted on each ridge with 12" between plants. In order to keep plant numbers consistent, all bare ground plots were 2 ridges x 10' for a total of 20 plants per plot. Mulched beds were also 10' long for a total of 20 plants per plant as well. It was a bright sunny day and the high temperature for this day was 79 degrees Fahrenheit with an average of 71 degrees, followed by a week of sunny weather and average temperature of 67 degrees F. On the day of planting, soil moisture was adequate and subsequent overhead irrigation was applied post planting for several days to cool the beds and ensure good conditions for plant survival. HVFH staff used straw to mulch between the rows of plastic for weed control. Ridges were cultivated during the season for weed control and all plots were hand weeded as needed. Irrigation was provided by HVFH staff as needed.

Plant stands were recorded on June 22, 2023. All plots were harvested October 4th and 5th 2023 by CCE ENYCHP. Roots were placed in harvest totes and HVFH staff placed roots with their own to be cured and stored. CCE ENYCHP staff began grading roots on November 27, 2023 and finished January 31, 2023. Grading consisted of weighing individual roots from each plot and determining marketability according to size and quality (decay, misshaped etc.). Marketable roots had to be of an acceptable sweet potato shape (cylindrical to bulbous) and weighed within these size categories: 'Fingerling' = between 1/4 – 3/4 of a pound; 'Large' = ¾ to 1.5 pounds; 'Jumbo' = roots over 1.5 pounds. Roots that were too thin, too small, misshaped or exhibited any signs or breakdown (rot) were culled.

Results and Discussion:

Variety Trial: Plastic Production: (Table 2)
Of the orange skinned orange fleshed varieties, LSU 18-100 produced the greatest number of Large category roots on plastic at 23,925 per acre compared to all other varieties on plastic. Averre was a close second with 23,780 Large roots, followed by Orleans and Beauregard B-14. Averre also produced the highest number of Jumbo Roots followed closely by LSU 18-100. LSU 18-100 and Averre Bellevue produced the highest number of Fingerling sized roots at 62,640 per acre followed by Orleans at 58,580 per acre and then Covington 46,400 and NC 122 at 44,370. NC 122 and Radiance had the fewest Large category roots. For more information, see Table 2 for all of the varieties.

In terms of overall Marketable Yields (number of roots), Orleans had the highest number of marketable roots. However, over 76% of those roots fell within the Fingerling sized category. However, other varieties had higher percentages of marketable yields in the Fingerling size category, which is what we would like to minimize (Table 3). On the other hand, Averre and LSU 18-100 had the highest marketable Large category root numbers with each having nearly a 1/3 of their roots. Averre also had the highest percentage of Jumbo roots at 17% followed by Beauregard at 13%. When looking at the poorest yielding varieties grown on plastic, NC 122 and Radiance had the lowest marketable yields per acre (pounds per acre). The lowest total marketable number of roots from plants grown on plastic mulches came from Bayou Belle (35,960) followed by Radiance with 40,600 roots per acre.). Unfortunately, Vermillion produced no marketable roots in either plastic or bare ground ridges. More information on percentages of yields can be found in Table 3.

For the two purple skin, purple fleshed varieties, Purple Majesty had a total marketable yield of 36,560 pounds of roots per acre followed closely by Purple Splendor with 32,835 pounds. Marketable root numbers were also similar with Purple Majesty averaging 63,220 roots per acre and Purple Splendor with 65,540 roots per acre. Percentage of Large roots were similar with 36% of Purple Majesty and 33% of Purple Splendor falling in that category. Pounds per acre or large roots were also similar with Purple Majesty at 13,429 and Purple Splendor with 11,231 pounds per acre. Purple Splendor had 5% more Fingerling roots compared to Purple Majesty. Overall across all the size categories, there was very little difference between the two varieties.

In 2023 Murasaki was our only purple/marron skin white flesh variety and has been the most popular variety in that class. One of the concerns with Murasaki is that it tends to be small and in this trial, 89% of the total number of roots and 75% of the marketable weight fell within the Fingerling category. Murasaki yielded 11% of it's total marketable roots and 24% of its marketable weight per acre in the Large category.

Bare Ground Ridges:
In this plastic mulch versus bare ground raised ridges, plastic yields were higher in every variety that were grown in both systems(Averre, Purple Majesty and Purple Splendor were only grown in plastic mulch due to low slip availability). In most cases, plastic out yielded bare ground 2-3 times. When looking at the traditional orange skin orange fleshed varieties on bare ground raised ridges, the market preferred Large Root size category, Beauregard B-14 was the highest bare ground yielding variety by nearly double the root numbers (5,220 roots per acre) compared to the next two closest varieties which were Orleans and Bellevue at 2,320 roots per acre. Likewise, Beauregard B-14 also resulted in the highest marketable Large Root weight per acre with 5,175 pounds of roots per acre. It also had the highest average large root size at nearly 1.0 pound per root. Beauregard B-14 also had the highest percentage of Large marketable roots and root weights per acre at 14% and 29% respectively with Orleans second with 12 and 23% Large marketable roots closely followed by Bellevue at 9 and 22%. NC 122 failed to produce any marketable Large roots with 100% of it's marketable yield in the Fingerling sized category. Other varieties such as Radiance, Bayou Belle and Covington produced over 90% of there roots in the Fingerling category (97%, 96% and 95% respectively). More information can be found in Table 3.

Murasaki, the only maroon/purple skinned white fleshed variety in the variety trial also produced a high percentage of roots (98%) and root weights (92%) in the Fingerling category with only 2% of it's roots in the Large category. When comparing this to plastic, Murasaki produced 89% of it's root numbers and 75% of its root weight per acre in the Fingerling category while nearly increasing the percentage of Large roots grown on plastic by 5 times compared to bare ground ridges.

Conclusions: Plastic mulches versus Bare ground

There is no doubt that producing sweet potatoes on plastic increases the marketability, especially within the "Large" size category (the preferred size for market) of nearly all the varieties in this trial, especially when they are compared to sweet potatoes grown on bare ground raised ridges. Not only are overall marketable yields increased, but average root size (weight) for every variety with the exception of Orleans, was increased when grown on plastic compared to bare ground.

The 2023 growing season was another atypical season, especially at sweet potato harvest time. Continued wet weather hampered harvesting of this trial at the Hudson Valley Farm Hub. One of the observations that was made is that harvesting roots from the plastic beds was much more efficient. During the harvest I watched the harvest team dig two bare ground ridges from this field which took them nearly an hour to do. They had to stop multiple times to unplug the harvester or to allow the harvest crew to break up the clods of mud to find the sweet potato roots. Not only was this time consuming, but it also in my opinion resulted in the skinning of many fo the roots by either trying to rub the mud off or just the general abrasion on the harvester chain itself. I feel that having those tightly formed, compact ridges inhibit the roots from expanding and also in a wet season, allows the mud and soil to cling to the sweet potato roots. On the same day, I watched the same crew harvest one bed of plastic mulched sweet potatoes that was left over from the trial. In 35 minutes with 1 stop, they had the bed harvested compared to the hour it took for the bare ground. The roots were also much more visibly cleaner, the soil was looser so finding the roots was easier and the overall quality of the roots was to me, better: very little to no skinning, less breakage, fewer lenticels and improved overall skin appearance. Descriptions of all of the varieties can be found in Table 4.

However, the above statements are just observations that I had made, and I have no replicated data, except that yields and overall size was significantly better in plastic compared to bare ground. Black plastic mulches we know warm and retain more soil heat compared to bare ground but in this case, with the wet harvest conditions, I believe the plastic mulches also improved the harvestability of roots because plastic beds were drier as the plastic funneled water between the beds and not into the beds. Not only could harvest time be potentially reduced, I feel that operations in the wash and pack could be reduced as well as roots grown on plastic mulches might require less washing and handling while improving quality with less skinning compared to bare ground roots. More savings could also be potentially found with less clean out of water drains and traps if roots grown on plastic are less dirty compared to bare ground roots, especially in a wet harvest season.

Plastic also comes with other costs – there is more labor associated with laying plastic mulch as it requires at least two people to put down (one driving the tractor, one helping to hold and start

the mulch at the begging and cutting at the end of each pass) whereas the bare ground ridge only requires the driver of the tractor pulling the implement. There is also the added cost of spreading straw or the laying of landscape fabric between the beds of plastic and holes where the plants are planted may need to be weeded once or twice a season. Bare ground raised beds can be cultivated as needed until the sweet potato vines start to become too big, but again this can be accomplished quickly with one person driving the tractor. Bare ground ridges may also need to be hand weeded once or twice as well which requires a fair amount of labor. Then there is the vine removal at harvest that needs to happen if using plastic mulches. Even though both plastic and bare ground ridges can be mowed, plastic beds usually require the additional cutting of vines near the plant holes in order for the plastic to be lifted so the roots can then be harvested. Bare ground ridges usually just require the mowing and then can be lifted directly without having to cut individual plants. Even if plastic outyields bare ground by 2-3 times, a more in-depth project where labor and input costs could be monitored more closely would need to be completed in order to determine which system is more cost effective.

Conclusion: Variety Selection

Selecting a sweet potato variety for production in our environment is difficult and is even more limited due to the fact that most varieties are developed for southern production regions. However, there does appear to be a few varieties that show more promise than others according to this trial. For those growers producing traditional orange skin orange fleshed varieties, looking to maximize that target root size of ¾ -1.5 pounds, Averre (Figure 10) and LSU 18-100 (Figure 9) grown on plastic would be an excellent choices followed by Beauregard B-14 (Figure 8). However, commercial availability of Averre and LSU 18-100 is limited.

Averre was a popular variety for southern producers 10 years ago but fell out of favor due to the fact it produced a high percentage of jumbos which would be sent to processing facilities which meant less profit compared to roots classified as Number 1 Grade A. Those are those packed in 50 pound cases and shipped to supermarkets and other retail outlets for direct to consumer sales. However, because I think our season in the Northeast is shorter compared to our southern producers, Averre appears to be a shorter season variety which means it has the potential to produce a high percentage of Large roots, without getting oversized. Averre's appearance is also very attractive with long, cylindrical, but still sweet potato shaped roots, with excellent medium orange skin and medium orange, sweet flesh.

LSU 18-100 is a new experimental line from the breeding program of Dr. Don LaBonte, at Lousian State University. It is difficult to determine how long it may take to move this variety into commercial production. There is the other concern that if it is not regularly accepted by the majority of southern sweet potato growers, it will be dropped from the program entirely. However, variety trials like this one that identify varieties like LSU 18-100 are extremely important as there has been a movement by some breeders that recognize the Northeast and Canada could be potential markets for shorter season sweet potato varieties. In addition, even though LSU 18-100 produced some of the highest yields of Large sized category roots, there is still concern that the root quality, mainly the shape is still not the most desirable: roots tend to be long, thin shaped roots with some traditional bulbous ones. It has an attractive light orange smooth skin and attractive flesh. Culls tended to be very long thin, misshaped roots or those that were strongly tapered and looked more like carrots than sweet potatoes. Another concern I have

is we noted a fair amount of mechanical damage (broken roots, cuts), probably due to their long, thin shape which makes them more prone to this kind of damage.

Beauregard B-14 is a slightly different clone of the traditional Beauregard variety and has stood the test of time. The B-14 strain tends to have fewer Jumbo roots compared to the original. In this trial and in trials past, Beauregard B-14 has been probably the most consistent variety evaluated. However, its tendency to produce oversized roots, especially in plastic, has seen it's popularity drop. However, I think due to it's dependibitly year in and year out to produce a high percentage of marketable roots, the Beauregard B-14 strain should be part of every sweet potato growers variety program.

It was also important to me to grow as many of these varieties in both plastic and bare ground to identify varieties that not only produce well in plastic culture, but also bare ground as there is still a fair number of producers not using plastic. Beauregard B-14 proved to be one variety that can produce well in both types of cultural systems. Likewise, Orleans may also be a variety to use if you are producing on bare ground.

I was very impressed with the two new purple skin purple fleshed varieties that were shipped to us this year from North Carolina State University. I have had several purple skin purple purple fleshed varieties in trials past, but none that I would recommend any growers produce commercially. If you are going to base your decision solely on production, Purple Majesty (Figure 6) holds a very slight edge on Purple Splendor (Figure 7) with only a 3% difference in Large root numbers and weight per acre. Purple Majesty I think has a slightly nicer shape and had fewer culls. I will note that not all, but a few Purple Majesty roots had a slightly textured, or bit of brown netting of the skin, but the dark purple almost black skin was still striking. I also think it was a bit more uniform with mostly long and slightly cylindrical but with a good taper. Purple Splendor was also dark purple, almost black skin color and somewhat smooth, but again with a slight texture. It has a very nice shape, slightly thinner compared to Purple Majesty.

Final Summary and Additional Research:
Although I was quite pleased with the 2023 variety trial, I feel that in order to provide good recommendations about a variety, they need to be trialed in multiple years and in multiple locations if possible. Based on this year's data, Averre, LSU 18-100 and Beauregard B-14 for orange skin orange fleshed varieties would be good choices for plastic production. Beauregard B-14 and Orleans would be the better choices for bare ground production. It would also appear that producing sweet potatoes using plastic mulches increases overall marketable yield as well as overall size of individual roots. However, more information I feel is needed to determine if this increase in yield and quality improves profitability with the additional costs associated with using plastic as mentioned above. However, I also think that other factors such as employee satisfaction, which is hard to put a value on, needs to be taken into account when producing sweet potatoes as well. Growing sweet potatoes on plastic mulch, especially in 2023, resulted in easier harvesting and improved root quality.

Figure 3: The number and weight of Marketable "Large" roots from varieties grown on plastic or bare ground.

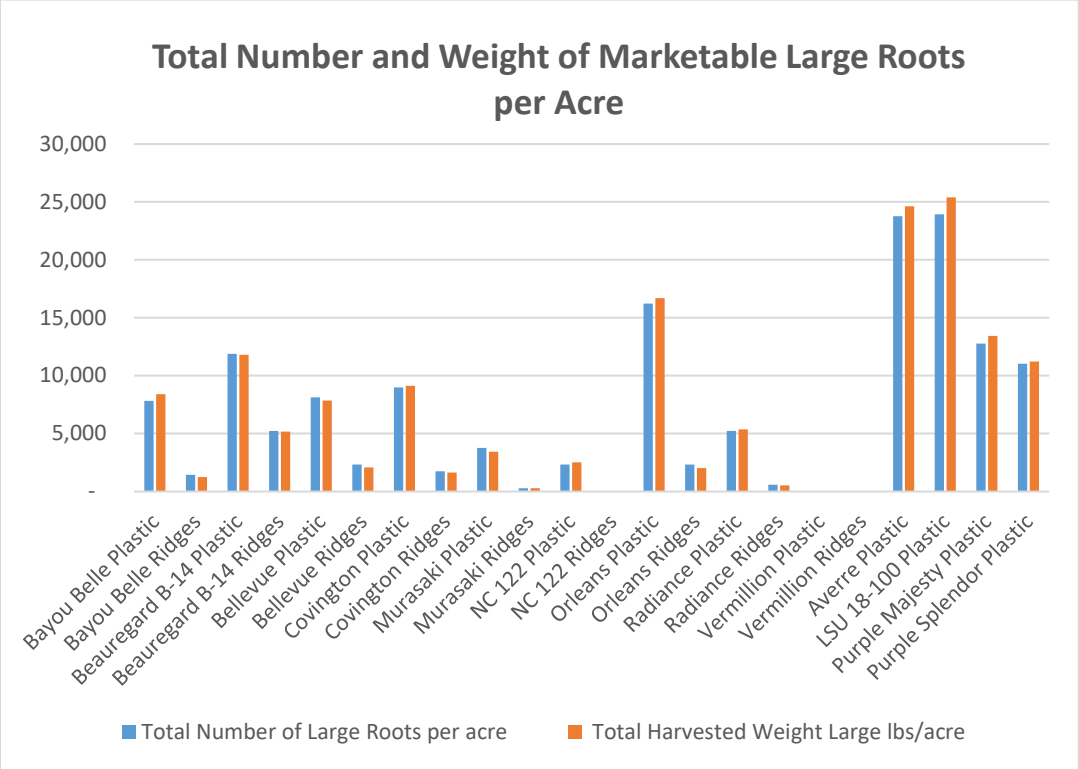

Figure 4: The number and weight of Marketable "Fingerling" roots from varieties grown on plastic or bare ground.

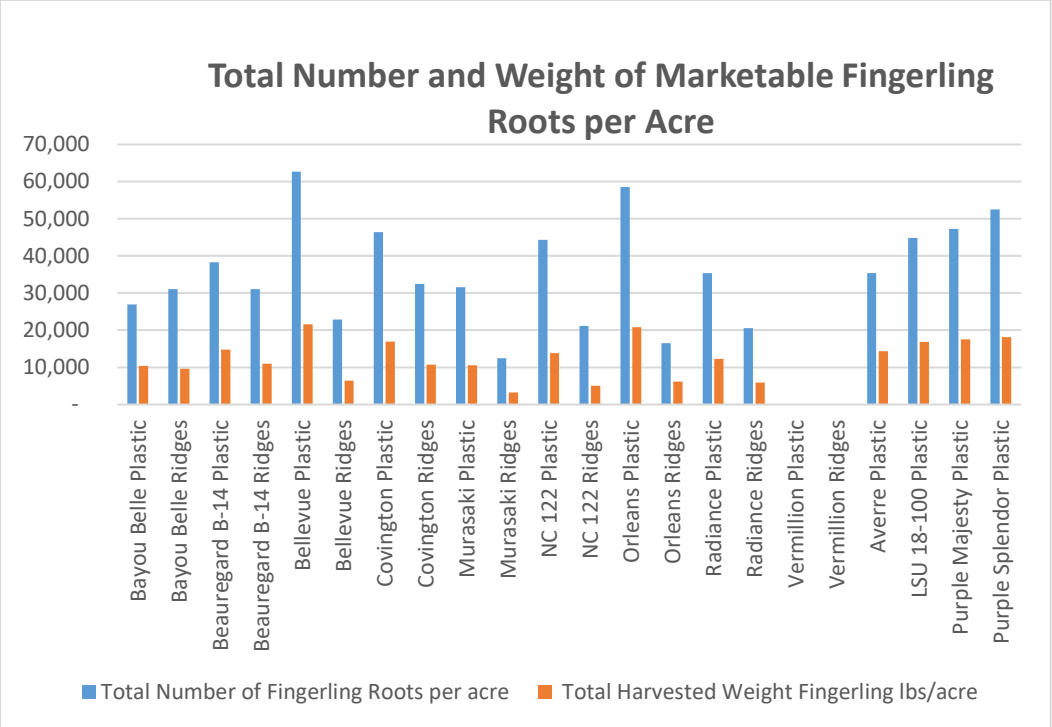

Figure 5: Average Marketable Root Size by Variety, Treatment and Size Category.

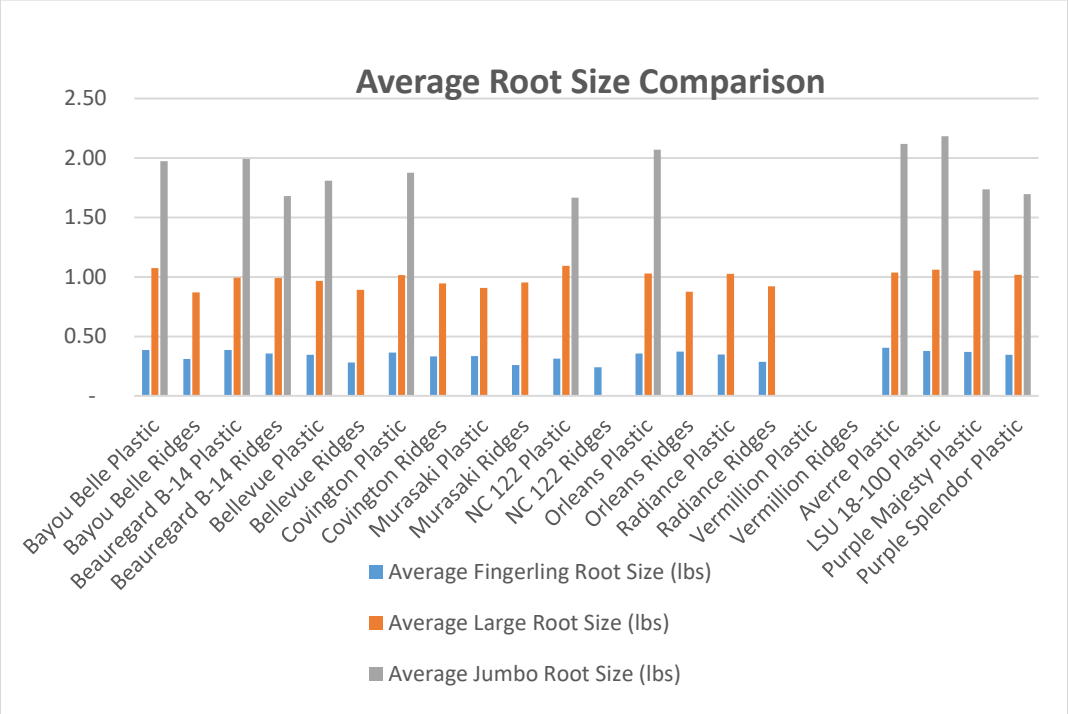

Figure 6: Purple Majesty

Figure 7: Purple Splendor

Figure 8: Beauregard B-14

Figure 9: LSU 18-100

Figure 10: Averre

Table 2: Total number and weight, marketable number and weight per acre and average root weights per size category.

Variety	Culture	Total Roots Harvested	Total Harvested Yield lbs/acre	Total Marketable Roots	Total Marketable Yield lbs/acre	Total Number of Fingerling Roots per acre	Total Harvested Weight Fingerling lbs/acre	Average Fingerling Root Size (lbs)	Total Number of Large Roots per acre	Total Harvested Weight Large lbs/acre	Average Large Root Size (lbs)	Total Number of Jumbo Roots per acre	Total Harvested Weight Jumbo lbs/acre	Average Jumbo Root Size (lbs)
Bayou Belle	Plastic	38,280	21,339	35,960	21,092	26,970	10,391	0.39	7,830	8,412	1.07	1,160	2,289	1.97
Bayou Belle	Ridges	42,050	11,850	32,480	10,874	31,030	9,615	0.31	1,450	1,260	0.87	-	-	0.00
Beauregard B-14	Plastic	62,930	41,615	57,420	41,020	38,280	14,787	0.39	11,890	11,799	0.99	7,250	14,434	1.99
Beauregard B-14	Ridges	43,790	17,921	36,830	17,178	31,030	11,029	0.36	5,220	5,175	0.99	580	973	1.68
Bellevue	Plastic	83,230	33,689	72,500	32,576	62,640	21,573	0.34	8,120	7,857	0.97	1,740	3,145	1.81
Bellevue	Ridges	34,800	9,468	25,230	8,483	22,910	6,413	0.28	2,320	2,070	0.89	-	-	0.00
Covington	Plastic	68,150	30,004	56,840	28,801	46,400	16,949	0.37	8,990	9,131	1.02	1,450	2,722	1.88
Covington	Ridges	39,150	13,007	34,220	12,386	32,480	10,740	0.33	1,740	1,645	0.95	-	-	0.00
Murasaki	Plastic	37,990	14,258	35,380	13,972	31,610	10,549	0.33	3,770	3,424	0.91	-	-	0.00
Murasaki	Ridges	22,330	4,361	12,760	3,500	12,470	3,223	0.26	290	277	0.95	-	-	0.00
NC 122	Plastic	50,170	17,707	47,270	17,362	44,370	13,861	0.31	2,320	2,534	1.09	580	967	1.67
NC 122	Ridges	35,960	6,507	21,170	5,090	21,170	5,090	0.24	-	-	-	-	-	0.00
Orleans	Plastic	85,260	43,664	77,430	42,890	58,580	20,791	0.35	16,240	16,694	1.03	2,610	5,405	2.07
Orleans	Ridges	24,360	8,728	18,850	8,176	16,530	6,146	0.37	2,320	2,031	0.88	-	-	0.00
Radiance	Plastic	46,980	18,260	40,600	17,632	35,380	12,271	0.35	5,220	5,361	1.03	-	-	0.00
Radiance	Ridges	26,680	6,983	21,170	6,436	20,590	5,901	0.29	580	535	0.92	-	-	0.00
Vermillion	Plastic		-	-	-	-	-	-	-	-	-	-	-	0.00
Vermillion	Ridges	-	-	-	-	-	-	-	-	-	-	-	-	0.00
The following varieties were grown only on plastic mulch due to the limited number of slips provided.														
Averre	Plastic	74,240	65,073	71,340	64,759	35,380	14,333	0.41	23,780	24,623	1.04	12,180	25,804	2.12
LSU 18-100	Plastic	76,995	57,591	75,690	57,468	44,805	16,876	0.38	23,925	25,398	1.06	6,960	15,194	2.18
Purple Majesty	Plastic	69,310	37,203	63,220	36,560	47,270	17,512	0.37	12,760	13,429	1.05	3,480	6,045	1.74
Purple Splendor	Plastic	75,690	33,867	65,540	32,835	52,490	18,161	0.35	11,020	11,231	1.02	2,030	3,442	1.70

LSU 18-100, Radiance and Vermillion slips were provided courtesy of Don R. La Bonte, School of Plant, Environmental, and Soil Sciences, Louisiana State University AgCenter

Averre, Purple Splendor and Purple Majesty were provided courtesy of Dr. Craig Yencho and Ken Pecota, North Carolina State University.

Covington, Bellevue, Orleans, NC 122, Murasaki, Beauregard B-14 and Bayou Belle were purchased from Jones Family Farm, Bailey, North Carolina

Table 3: Percentage Marketable Roots and Weight per acre by Size Categories.

Variety	Culture	% of marketable Fingerling Roots	% of Marketable Fingerling Weight	% of marketable Large Roots	% of marketable Large Weight	% of marketable Jumbo Roots	% of marketable Jumbo Weight
Bayou Belle	Plastic	75	49	22	39	3	11
Bayou Belle	Ridges	96	88	4	11	0	0
Beauregard B-14	Plastic	67	36	21	28	13	35
Beauregard B-14	Ridges	84	64	14	29	2	5
Bellevue	Plastic	86	66	11	23	2	9
Bellevue	Ridges	91	76	9	22	0	0
Covington	Plastic	82	59	16	30	0	9
Covington	Ridges	95	87	5	13	0	0
Murasaki	Plastic	89	75	11	24	0	0
Murasaki	Ridges	98	92	2	6	0	0
NC 122	Plastic	94	80	5	14	1	5
NC 122	Ridges	100	100	0	0	0	0
Orleans	Plastic	76	48	21	38	3	12
Orleans	Ridges	88	75	12	23	0	0
Radiance	Plastic	87	70	13	29	0	0
Radiance	Ridges	97	92	3	8	0	0
Vermillion	Plastic						
Vermillion	Ridges						
The following varieties were grown only on plastic mulch due to the limited number of slips provided.							
Averre	Plastic	50	22	33	38	17	40
LSU 18-100	Plastic	59	29	32	44	9	26
Purple Majesty	Plastic	75	47	20	36	6	16
Purple Splendor	Plastic	80	54	17	33	3	10

LSU 18-100, Radiance and Vermillion slips were provided courtesy of Don R. La Bonte, School of Plant, Environmental, and Soil Sciences, Louisiana State University AgCenter

Averre, Purple Splendor and Purple Majesty were provided courtesy of Dr. Craig Yencho and Ken Pecota, North Carolina State University.

Covington, Bellevue, Orleans, NC 122, Murasaki, Beauregard B-14 and Bayou Belle were purchased from Jones Family Farm, Bailey, North Carolina

Table 4: Descriptions of 13 Sweet Potato Varieties Grown on Plastic Mulch and Bare Ground Raised Ridges.

Variety	Culture	Variety Description
Bayou Belle	Plastic	My notes say "looks really nice in the bin" - Reddish purple maroon skin color, roots tend to be long, somewhat thin and skin easily. Strong taper, not a large bulbous type. Skin is somewhat smooth and attractive but still not a "typical" sweet potato shape. Culls were mostly shape (too long and thin) slightly elongated to cylindrical - nice overall.
Bayou Belle	Ridges	Reddish orange skin color - some mechanical damage, roots are all over the place, but most are long and thin shaped with strong tapers on each end. A few aren't bad looking, but still thin and tapered. Culls were size and shape(long, thin
Beauregard B-14	Plastic	Big! Nicely shaped for the most part, typical or desirable shape - but maybe too big? Some with strong taper, others not so much - great color - medium bright coppery orange skin color - somewhat smooth but few had deep holes where root hairs were/are attached. Great sweet potato shape!
Beauregard B-14	Ridges	Strong tapered shape, especially at the vine attachment giving it a tear drop shape - which is very uniform across the variety. Skin is light orange pinky colored but not as light as Bellevue. Roots are decent sized with some of them the largest we've seen so far on bare ground. Fair amount of rodent damage and seems to be skinning more than others - some sprouting as well. Culls were size and shape
Bellevue	Plastic	Very bulbous shape, especially the larger ones - light orange, bright smooth skin - slight taper on some and a strong taper on others to the point where they almost look like carrots - overall size is a bit small.
Bellevue	Ridges	Light orange coled skin, decent shape, more rounded ends instead of tapered (blunt), fairly uniform, not bad looking overall - skin can have some texture to it.
Covington	Plastic	Not bad - however they are fairly long and somewhat skinny - some with a good typical sweet potato shape - overall size is good but a bit variable between replications, but still a fair number of fingerlings - smooth, medium orange reddish copper colored, fairly smooth skin. Lots of large root hairs coming off the roots - some veins apparent, but not terrible - ok shape with strong tapers
Covington	Ridges	More of a light pinky reddish orange colored skin that is fairly smooth and uniform - some nice large roots, decent shape, not a lot of taper. Culls were size (too small). Fair amount of mechanical damage (harvest damage - broken roots).
Murasaki	Plastic	Maroon to purply maroon smooth skin color, mostly long cylindrical to just long and thin, strongly tapered - not bad overall, but not a lot of marketable yield
Murasaki	Ridges	Reddish purple skin color, fairly tapered or strongly tapered roots, some miss-shapes, some long spindly shapes, not very good, poor yield. Culls were mostly size and thin shape.
NC 122	Plastic	Nice dark maroon purple smooth skin that makes them very attractive looking with orange flesh - however, they are long and skinny with very little to no bulb to them - reminds me of Carolina Ruby. a lot of mechanical damage = mostly breakage of roots because of the length and thinness

NC 122	Ridges	Dark purple skin color, strong taper and overall small root size. Culls were size and intestine shaped roots(too long and thin)
Variety	**Culture**	**Root Description**
Orleans	Plastic	Medium to light orange to reddish pinky skin, bright colored attractive skin - not as light as Bellevue - mostly long with strong taper on one end, but not bad - decent overall shape, decent size, some oversized for sure but probably no more then some fo the others - some raised lenticels and root hairs - strong taper in which most of the culls actually look like carrots.
Orleans	Ridges	First appearance is not bad, some rodent damage but medium to light orange to somewhat of a pinky orange skin color, not really orange but pink skin color, somewhat smooth. Variable shape with some really fat and bulbous but also a fair amount of smaller, thinner longer roots. Not a bad variety overall. Culls were size (too small)
Radiance	Plastic	One replicate was really nice - clean, excellent shape, slightly elongated but still somewhat bulbous - smooth coppery orange skin, attractive and nice. Second replicate was not as nice looking - lots of small roots, elongated, not more "intestine" shaped ones in this plot - really long and skinny. Not impressed with this rep - fair number of soft roots in this plot too.
Radiance	Ridges	Reddish pinky orange color with some more darker reddish orange ones - variable. Shape is not bad but most roots tend to be long and thin or elongate - not really a bulbous shape but still acceptable. A few lenticels but not terrible. Culls again were mostly due to shape (long intestines)
Vermillion	Plastic	Unfortunately there were not roots to describe.
Vermillion	Ridges	Unfortunately there were not roots to describe.
The following varieties were grown only on plastic mulch due to the limited number of slips provided.		
Averre	Plastic	Large roots, medium orange/copper colored skin. A few veins on larger roots, but not bad. Decent shape - slight taper on some but most are nicely shaped. Some texture to the skin, but not bad. Very attractive - good size, fairly uniform - nice overall.
LSU 18-100	Plastic	Long, thin shaped roots with some traditional bulbous ones - light orange smooth skin, no veins to speak of. Size isn't bad, can have a strong taper with the shape - again culls can be long, thin like intestines or strongly tapered like carrots. Fair amount of mechanical damage probably due to their long, thin shape
Purple Majesty	Plastic	Really nice dark purple almost black skin, slightly textured, or bit of brown netting over it -but not bad - very uniform - beautiful bright purple flesh, mostly long and slightly cylindrical but with a good taper - excellent overall appearance. Size is excellent and very nice shape. Would recommend growing.

Purple Splendor	Plastic	Dark purple, almost black skin color and somewhat smooth with a slight texture - not nearly as much texture as Purple Majesty. Very nice shape - some long thin ones but not bad - mostly cylindrical but can have strong taper so some are kind of tear dropped shaped. Fair amount of small roots but decent shape - nice overall. Culls were intestine shaped