

What Have We Learned About Growing Sweet Potatoes: Plant Spacing, Floating Rowcovers and Plastic Mulches

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This project continues to find ways to improve the overall quality and yield of sweet potatoes grown in New York. The expanding market for diverse products for an increasing number of farmer's markets in the area and the reported health benefits of sweet potatoes makes them ideal for this area. However, many growers do not believe they can grow a good quality sweet potato crop in our climate.

In the summer of 2011, we completed 3 research projects including evaluating the use of floating rowcovers, Infrared Transmitting (IRT) Plastic versus traditional black, plant spacing and population study and using transplants compared to the standard slips commonly used. I would like to thank our trial cooperators, Samascott Orchards for allowing these trials to be completed on their farm and I would also like to thank Jim Ballerstein of the New York State Agricultural Experiment Station located in Geneva, NY, for all the help and guidance he has given on this project. I would also like to thank Northeast SARE for supporting this project.

On-Farm Research Trials:

Infrared transmitting mulch (IRT) vs. standard black embossed plastic mulch with or without floating rowcovers: Sweet potato slips of the variety Covington were planted on June 10, 2011 in raised beds mulched with either IRT or black plastic mulch. Each plot consisted of 2 rows of IRT and 2 rows of black mulch. Floating rowcovers (DuPont 5131) were applied to half of the plots, while the other half were left uncovered.

Results of this trial were interesting. In talking with some growers, they indicated that they felt rowcovers increased their marketable yield of sweet potato roots. However, in this trial, regardless of mulch color, yields were reduced when floating rowcovers were applied. Likewise, we did not see much of an advantage to using IRT (infra-red transmitting) mulch when compared to standard black embossed mulch. The highest marketable root yields were obtained with black mulch and no rowcovers. See Tables 1-3 for more information.

Slip Plant Spacing Trial: Slips of the variety Covington were planted on June 7, 2011 into black plastic raised beds with drip irrigation. Treatments consisted of slips planted in different spacing configurations including: single row down the center of the bed, 6" or 12" apart or a double staggered row of plants placed 8" from the edges of the bed at 12" or 18". Results were mixed in this trial as the highest marketable yields were a result of a double staggered row 12" apart. However, these roots were mostly in the "Small" category while the single row, 6" spacing resulted in the highest yield of sweet potato roots in the "Large" category followed by the double row, 18" spacing. The single row, 12" spacing resulted in the highest marketable "Jumbo" roots, but the lowest "Large" roots. See Table 4 for more information.

Transplants spacing vs. Conventional slips: Unfortunately, slips that were ordered from Scott Farms located in North Carolina, in December for mid May delivery were never received. These slips were to

be placed in 50-cell transplant trays and placed a greenhouse for 2 weeks. Upon calling the company to find out what had happened, I was told that my order had been delayed and that there was a good chance it would not be shipped due to a shortage of slips in the major sweet potato production areas due to widespread flooding of already planted sweet potato crops. This resulted in a major shortage of slips for growers throughout the Northeast as southern growers purchased a majority of the slips produced for replanting. Fortunately, we did receive our slips, but later than we would have liked to receive them.

Therefore, on June 7, 2011 sweet potato slips of the variety Covington were planted in 50 cell transplant flats at Samascott Orchards. These transplants were then planted in the field on June 24, 2011 into black plastic mulch with drip tape. Treatments consisted of transplants planted in different spacing configurations including: single row down the center of the bed, 6" or 12" apart or a double staggered row of plants placed 8" from the edges of the bed at 12" or 18". As a comparison, slips delivered two days before this trial was planted were planted in a single row down the center of the bed 12" apart. The results of this trial were interesting with transplants in a double staggered row 18" apart resulting in the total highest marketable root yields and also the highest "Large" category (roots that are 1 pound or more, but less than 2 pounds) numbers and total yield. However, no treatments provided any "Jumbo" roots (roots that are over 2 pounds). See Table 5 for more information. One objective of using transplants was to try and maximize the number of "Large" roots as that tends to be what growers are looking for. However, the extra management and cost of producing transplants may be greater than the returns in the number of large roots. However, due to the lateness of planting this trial, these results might be quite different from if they were planted in the greenhouse in May and planted earlier in the field in June.

Table 1: The Effects of Floating Rowcovers and Plastic Mulches on the Number and Total Marketable Yield of Sweet Potato Roots (per acre).

Plastic Type	Rowcover Treatment	# Jumbo	Average			Average			Average	
			Weight Jumbo	Root Size (lbs)	# Large	Weight Large	Root Size (lbs)	# Small	Weight Small	Root Size (lbs)
IRT	RC	504	1,180	2.34	2,772	3,595	1.30	19,572	10,584	0.54
IRT	NRC	588	1,554	2.64	5,796	7,589	1.31	20,664	11,008	0.53
BLACK	RC	420	1,138	2.71	3,864	5,183	1.34	21,252	11,075	0.52
BLACK	NRC	1,764	4,288	2.43	7,644	9,920	1.30	15,036	10,765	0.72

Table 2: The Effects of Two Different Plastic Mulches on the Number and Total Marketable Yield of Sweet Potato Roots (per acre).

Plastic Type	# Jumbo	Average			Average			Average	
		Weight Jumbo	Root Size (lbs)	# Large	Weight Large	Root Size (lbs)	# Small	Weight Small	Root Size (lbs)
IRT	546	1,367	2.50	4,284	5,592	1.31	20,118	10,796	0.54
BLACK	1,092	2,713	2.48	5,754	7,552	1.31	18,144	10,920	0.60

Table 3: The Effects of Floating Rowcovers on the Number and Total Marketable Yield of Sweet Potato Roots (per acre).

Plastic Type	# Jumbo	Average			Average			Average	
		Weight Jumbo	Root Size (lbs)	# Large	Weight Large	Root Size (lbs)	# Small	Weight Small	Root Size (lbs)
No Rowcover	1,176	2,921	2.48	6,720	8,755	1.30	17,850	10,886	0.61
Rowcover	462	1,159	2.51	3,318	4,389	1.32	20,412	10,830	0.53

Size Categories: Jumbo = <2.0 lbs; Large = 1.0 - 2.0 lbs and at least 2 -3" in diameter; Small = 0.25 - 1.0 lbs and at least 1.5 -2.0" in diameter.

These plants were all planted in a single row, 15" down the center of a 4" raised mulched bed on 6.5' centers and a 34" bed top width.

Table 4: In-Row Spacing and Plant Populations on the Number and Yield of Marketable Sweet Potato Roots.

Spacing Treatment ¹	# Jumbo	Weight Jumbo	Average Root Size (lbs)	# Large	Weight Large	Average Root Size (lbs)	# Small	Weight Small	Average Root Size (lbs)
1x, 6"	298	682	2.3	6,109	7,904	1.29	22,946	11,443	0.50
1x, 12"	1,043	2,414	2.3	4,470	5,833	1.31	14,900	8,299	0.56
2x, 18"	745	1,676	2.3	5,215	7,025	1.35	20,264	10,445	0.52
2x, 12"	0	0	0	5,066	6,370	1.26	28,012	13,783	0.49

Size Categories: Jumbo = <2.0 lbs; Large = 1.0 - 2.0 lbs and at least 2 -3" in diameter; Small = 0.25 - 1.0 lbs and at least 1.5 -2.0" in diameter.

¹ 1x represents a single row down the center of the mulched bed and a 2x indicates a double staggered row with 14" between rows. The 6", 12" and 18" represent the in-row spacing. These were all planted on 4" raised mulched beds on 6.5' centers and a 34" bed top width.

Table 5: Comparing the Use of Sweet Potato Transplants to Traditional Slips and Plant Spacing on Total Marketable Number and Yield of Roots.

Spacing Treatment ^{1,2}	# Jumbo	Weight Jumbo	Average Root Size (lbs)	# Large	Weight Large	Average Root Size (lbs)	# Small	Weight Small	Average Root Size (lbs)
TP, 1x, 6"	0	0	0	466	559	1.20	32,154	14,073	0.44
TP, 1x, 12"	0	0	0	3,029	3,495	1.15	19,572	10,089	0.52
TP, 2x, 18"	0	0	0	3,495	4,485	1.28	29,125	13,631	0.47
TP, 2x, 12"	0	0	0	1,631	2,127	1.30	34,018	15,308	0.45
SP, 1x, 12"	0	0	0	0	0	0.00	11,417	5,382	0.47

Size Categories: Jumbo = <2.0 lbs; Large = 1.0 - 2.0 lbs and at least 2 -3" in diameter; Small = 0.25 - 1.0 lbs and at least 1.5 -2.0" in diameter.

¹ 1x represents a single row down the center of the mulched bed and a 2x indicates a double staggered row with 14" between rows. The 6", 12" and 18" represent the in-row spacing. These were all planted on 4" raised mulched beds on 6.5' centers and a 34" bed top width.

² TP Stands for Transplant and SP stands for traditional slip.