

**2016 Southern Wisconsin
Vegetable Production Workshop
Sweet Potatoes**



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Location	Athens, WI	Blue Mounds, WI	Soldiers Grove, WI
Acres in vegetables	12 acres	35	60
Acres in Sweet Potatoes	6 beds, 525' long	0.33	1.2
How these tasks are done for Sweet Potatoes			
field prep/tillage	with a tractor	with a tractor	with a tractor
transplanting	with a tractor	with a tractor	by hand
cultivating	with a walking tractor	with a tractor	with a tractor
spreading amendments	with a tractor	with a tractor	with a tractor
mulch laying	with a tractor	do not do this task for sweet potatoes	do not do this task for sweet potatoes
laying irrigation lines	with a tractor	do not do this task for sweet potatoes	by hand
laying row cover	do not do this task for sweet potatoes	do not do this task for sweet potatoes	do not do this task for sweet potatoes
spraying for pests, diseases, or weeds	do not do this task for sweet potatoes	do not do this task for sweet potatoes	with a tractor
harvesting	by hand	by hand	with a tractor
hauling harvested crop from the field	with a tractor	with a tractor	with a tractor
mowing cover crops or crop residues	with a tractor	with a tractor	with a tractor
incorporating cover crops or crop residue	with a tractor	with a tractor	with a tractor
farming style	certified organic	certified organic	certified organic

Propagation

Varieties	Beauregard	Beauregard	Beauregard
Slip Sources	I currently purchase sweet potato slips.	I have grown my own slips, but do not do so any longer. I currently purchase slips.	I currently purchase sweet potato slips.
Slip Suppliers	Kansas state - slips are good but they are flakey! The forgot to send our order in 2015, sent way to few slips in 2014 and then way over sent replacements. Boxes are often torn and falling apart when they arrive	Kansas State University (tamyers@k-state.edu) slips are very good, although arrive quite late. Even with late planting, yield is very good.	Steel Plant Co., Smith Farms, New Sprout Farms
Storing Purchased Slips	into cool corner of packshed and plant asap	Put them in buckets with a few inches of water, provided they are being held a short time. Can hold for long periods in potting mix.	Unpack immediately, plant ASAP
Soil Mix for Growing Slips		Vermont Compost	
Sprouting Tray		black bulb crates	

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Propagation Schedule/Technique		Plant tubers into Vermont Compost in black crates in a layer. Do not let sweet potatoes touch each other. Plant earlier March, as soon as greenhouse heat is on. Must be kept as warm as possible. Pre-sprout if you have facility to do it. Pull or clip emerging slips when about 12" long and pot into buckets in compost/potting mix. Want at least 3 nodes on the slip. Begin to transplant after last frost; however they take a frost no problem. Can plant into late June at least and still get a good harvest.	
Greenhouse Irrigation		Use a water wand to keep the soil from drying out.	
Other Notes on Propagation		Only problem growing our own slips was freeze damage when shipping certified seed from Louisiana. This is a big reason we stopped growing our own. Also, they take critical space in the greenhouse for an extended period of time.	

Field Prep

Preceding Cash Crop	spring brassicas or full year fallow (with cover crops)	usually melon, because I use our lightest ground	Parsnip, Sweet Potato, Cover Crop (usually oat/pea mix or vetch) some times winter rye
Preceding Cover Crop	oats and peas and crimson clover	usually alfalfa	oats and peas
Soil Amendments	cow manure based compost from our farm	Soil test first. A general midwest production guide calls for 80-75-250 NPK. Use Midwest Bio Ag products for P and K. Use cover crop or soybean meal for N.	Custom blend from Midwest bio ag that has all of the micros. applied at a rate of 2-400 lbs to the acre. 5-800 lbs of a turkey or chicken compost. all applications are based on a soil test and general requirements of crop.

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Bed Prep	chisel plow, disk, bed shape and plastic lay	Rotovator is usually used initially, depends on prior crop and ground conditions. Planted later so some "seedbed sterilization" is done with a Perfecta.	Field prep varies widely on soil condition, presence of residue when we need the field etc. Generally speaking some type of primary tillage is done either with a disc or chisel or both. Then a finishing pass is made with a field cultivator or rotovator. Then beds are pulled using a rain flo 2550 mulch layer (no mulch). Now that we have beds we can stale bed them using a Budding Basket weeder several times and have a relatively clean bed to plant into.
Bed Shaping	we only plant into raised beds and we use a plastic bed layer from rainflo	I used to create hills with a potato hiller, and then plant into them. Stop doing that because it was harder to keep the soil moist immediately after transplanting. Still hill, but after they are planted and have good growth.	see above
Pre-Planting Mulch	plastic mulch	Used to use plastic mulch for heat and weed control. Found equal or better yields without it so no longer use plastic.	
Other Notes on Field Prep	we trailed plastic vs non plastic in the hoophouse and yield were marginally different... but the hoophouse sweet potatoes had more rodent damage and were barely better in yield difference in the hoophouse.		

Transplanting

Bed Width	36 inches	Plant in 30 inch wide rows	We plant ours 6' on center on top of a 30" bed.
Sweet Potato Spacing	2 rows/bed 16 inches between rows, 1 foot between plants	12 inches	1 row per bed 12" apart. We will sometimes put multiple plants in one hole if a plant is looking raggedy. Goal is to have at least one living plant in each hole.

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Transplanting Process	use water wheel transplanter with 60-100 gallons/bed of water, plant slips and squeeze soil around them	Use a bare root transplanter. It is a Powel, which is very common with strawberry growers.	We usually mark the holes with a water wheel transplanter and then a crew follows with the plants firmly packing the soil around each plant. If it is a field that has access to water and there is no water in the forecast we may consider setting up irrigation and running it. Keeping new bare root transplants wet with good soil to plant contact is really crucial.
Fertility at Transplant	compost spread during bed prep		N/A
Water at Transplant	see transplanting	We do not use any water on the transplanter, but instead irrigate immediately after transplanting and keep the soil moist until the plants "take off". This is critical to keep the slips alive.	If conditions are very dry over head water may be applied immediately after transplanting.
Mulch at Transplant	want to use straw mulch this season if there is enough on the farm		
Row Cover	none used		none used

Crop Maintenance

Irrigation	irrigate for about 1 inch/rain/week equivalent, if no natural precipitation	Use a traveling gun. Keep the soil moist without drying out until the plants are putting on new growth and have good roots.	our nicest sweet potato's are always ones that we haven't irrigated much. Watering is something we are still figuring out. But it is very minimal at our farm for sweet potatoes
Irrigation Modifications	irrigate a lot during first few weeks/establishment.	After the plants are actively growing, only irrigate when the plants show stress. The larger the plants get, the less irrigation is needed. A bit counter intuitive.	Watering would be done on a keep the plants alive basis. Too much water and roots turn black. It is still something we are trying to figure out. I don't have any hard and fast recommendations.
Supplemental Fertility	none used	Applied as described above, if needed. All fertility supplements applied preplant.	I would consider using some liquid blends but haven't gotten around to yet. Those would be applied 4-6 times (once a week) during bulking or when the plant is doing it's main growing of the fruit.

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Weeding	weed out holes every one, then mow between beds until vines are everywhere	After transplanting, use a tractor mounted cultivator aggressively. When plants get big enough, use a potato hiller to weed and create hills. Usually at this point the plants are ready to spread over the entire bed. May need to do one hand weeding for escaped weeds.	Weeds are managed mainly with tractors. We stale bed prior to planting, giving new plants 7 to 10 days to get well rooted. Once well rooted, we will visit the field with a finger weeder every 7 days or so until crop is too large to get through (usually 3-6 times). For the wheel track we have large sweeps mounted on a tool bar that cleans up broader areas and also will slip under the vines for one last late cultivation. If things go well, we will only have to hand weed once or twice at a cost of about \$3-600 per acre.
Insects	none other than rodents	None	None
Rodents	pray :)	Nothing. We lose some of the crop.	Rodents damage easily 30% or more of the crop. I don't really do anything to discourage rodents because I'm not sure that there is anything that could be done. Some things I have heard people try is overhead watering at least once per week to make sure the ground is always wet, which the rodents do not like. (I don't either but I will still go and dig potatoes in the rain if that is what it takes to feed my family.) Another thing is spraying hot pepper wax. Again I haven't had a chance to try it. The third thing is to keep a large area around field mowed really short to encourage hawks and other flying pray to spot the critters running to and from the field. (Our rodents live in the field.)
Diseases	none	None	Only issue we have had is a blackening of tuber which we have connected to prolonged soil moisture. Limit watering, plant in well drained field.
Scurf	have not had	Not a problem	Balance soil.

Harvest and Yields

Harvest Window	around first frost date - sept 15 average	We need to harvest in time for our last CSA deliveries in October, including giving some curing time. If we get a hard frost, this means we would harvest also, but usually it is a timing issue for us.	Any time mid to late September or after.
Harvest Procedure	underdig with "plastic digger" style digger, flip over manually, break off tubers, place in bin minimizing scratching	We undercut the sweet potatoes. Same machine as used for plastic mulch lifting. The potatoes are hand harvest into crates and loaded into a truck.	First we cut vines in wheel track to make a path for the digger. then we mow the vines as close to the ground as we can without hitting the sweet potato's. Then follow with a potato digger that generally separates potatoes from soil. It is not a perfect system but it is what we have to work with at this time. After digging a crew goes behind and separates the roots from the vines and places them into a shallow bulb tray. Another crew comes behind and loads the trays onto flat wagons with pallets. Wagons are pulled up to storage area where the pallets of trays are unloaded and put into storage with a fork lift.
Curing	Trying to get to 80 degrees in greenhouse during day with no supplemental heat so we don't hold that temp at night. Usually get to 80 in the day (thermostat controlled roll down sides) and 60 at night for 5 - 10 days.	Put sweet potatoes into a box truck, add "milkhouse" heaters and try to maintain a temperature of 85 degrees. Put water on the floor to keep as much humidity as possible, the goal being 90% humidity.	We have a cooler that we heat. Generally we try to keep it 90% plus humidity and a temp of 85-88 degrees for 7-10 days. Then they are generally considered cured.
Cleaning	hand wash on screen table right before selling		Once tubers are cured they are washed in one of two ways. Either on a screen sprayed off with a hose, or as they become more cured as the season moves on, we start running them through our brush washer. At this point they are graded into different grades
Packing	Unlined bulb crates are poured into potato mesh bags and storee in the barn root cellar.	Goes into CSA shares	Pack into 1 1/9 bushel boxes (40 lbs) Or back into some type of tray for CSA and market.

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Storage After Curing	root cellar is semi humid and around 50 degrees and dark	Can not get below 50 degrees. Hold in dark cool room, 55 to 60 degrees is goal. They will hold for many months with the correct storage conditions. We do not have a long term storage goal.	The cured sweet potatoes are stored in the same room they are cured in. There is circulation fans that run 24-7 along with a thermostat controlled heater. They will generally keep for 5 months. You do notice quality diminishing over time.
Yields	1,275lbs/acre	2015 harvest was 2 lbs per foot of row; or 4 lbs per "bed foot".	Last years numbers came in at 2.3 lbs per bed foot. The total harvest yield was 16,825 lbs per acre.
Other Notes on Harvest and Yields	compared yields in single row and double row beds in 2013 - yields were comparable but tubers were bigger and yields slightly higher in single rows.		

Marketing

Markets	CSA, farmers market, direct to restaurant, other	CSA	CSA, farmers market, direct to grocery, direct to restaurant
CSA	CSA - 10lbs/full share, 7/small share, 15 lbs/storage shares	6 lbs per share	varies widely depending on box. 2-5 pounds per box.
Farmers Market Prices	\$2/lb		\$2.50 per pound at farmers market.
Direct to Grocery Prices	n/a		\$1.60 ish per pound
Direct to Restaurant Prices	\$2/lb		\$1.60 ish per pound.
Wholesale Prices to Distributor	n/a		N/A
Other Markets	farmer buyer club - \$2/lb		N/A
Markets for Seconds	market "fingerling" sweet potatoes at market in quarts at \$1.5/lb		Food pantry. Usually nothing is paid. In our area some people have started something called Community Hunger Solutions which is a system where they will pay .8-.10 cents per pound for seconds roots.