

**2016 Southern Wisconsin
Vegetable Production Workshop
Melons**



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Emerson Urban Produce

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Stoney Acres Farm

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Tipi Produce

Location	Madison, WI	Athens, WI	Evansville, WI
Acres in vegetables	1/4 acre	12 acres	45 acres
Field Area in Melons	250-500sq/ft	3 x 400 ft beds	about 3 acres
Hoophouse Area in Melons	none	72x30 on average	none
How these tasks are done for Melons			
field prep/tillage	by hand	with a tractor	with a tractor
hoophouse prep/tillage	do not do this task for melons	walking tractor	do not do this task for melons
transplanting	do not do this task for melons	with a tractor	with a tractor
direct seeding	by hand	with a tractor	do not do this task for melons
cultivating	by hand	by hand	with a tractor
spreading amendments	by hand	with a tractor	with a tractor
mulch laying	by hand	with a tractor	with a tractor
laying irrigation lines	by hand	with a tractor	with a tractor
laying row cover	do not do this task for melons	do not do this task for melons	by hand
spraying for pests, diseases, or weeds	do not do this task for melons	by hand	with a tractor
harvesting	by hand	by hand	by hand
hauling harvested crop from the field	by hand	with a tractor	with a tractor
mowing cover crops or crop residues	by hand	with a tractor	with a tractor
incorporating cover crops or crop residu	by hand	with a tractor	with a tractor
farming style	Sustainable-Minimal soil disturbance, use of onsite organic matter, cover cropping, IPM focusing on attracting beneficial insects, no herbicide, OMRI approved pesticide in emergency situations, minimize city water use, and local distribution.	certified organic	certified organic
general melon methods	direct seed to field	transplant and direct seed to field transplant to hoophouse	transplant to field

Propagation

Varieties	<u>Field/Direct Seed</u> Melons: Serenade-small (1-2lbs), super sweet, aromatic, dramatic color change when mature, harvest at full slip, stores well, trellisable. Sun Jewel-small (>2lbs), sweet white flesh, crisp refreshing flavor, aromatic, trellisable, harvest at full slip, can have cracking issues. Watermelons: Sweet Beauty- family size (5-7lbs) great texture, healthy vines, consistent producer in warm or cool summer. Sweet Favorite- picnic size (10-12lbs) sweet in cool summers, consistent producer. Shiny Boy- party size (18-22lbs) Good disease resistance, produces better in warm summers	<u>Field & Hoophouse/Direct Seed</u> Sarah's Choice, Arava	<u>Field/Transplant</u> Watermelons- Starlight, Jade Star (Pata Negra), Lantha, Yellow Doll, Sangria, Shiny Boy, Tiger Baby- all seeded types Cantaloupe/Muskmelon- Halona, Strike, Rock Star, Sarah's Choice
Propagation Schedule	direct seeding only	<u>Field:</u> For a June 5th-10th transplant date start them on May 10th-15th <u>Hoophouse:</u> has been later June 1, because melons have followed an early crop like carrots for CSA boxes.	1st planting: start 4/22, transplant 5/16-20 2nd planting: start 5/6-8, transplant 6/1-3 3rd planting: start 6/2, transplant 6/25-7/1 4th planting: start 6/6-10, transplant 7/4-7/8
Soil Mix		Vermont Compost Fort V	We make our own mix- peat, vermiculite, perlite, Purple Cow compost, kelp, soy meal, alfalfa meal, feather meal, Sustaine, Therm-X 70, pasteurized soil.
Seedling Trays		50s seeded by hand 2 seeds/cell and thin	Tray w/cells holding about 120cc soil, 36 cells per 22x11" tray. First dibble flats with home-made board, then seed by hand or with Seederman. Water moderately, do not soak soil, melons germinate better slightly dry.
Germination		into germination chamber	Into germ room, 100% humidity, 76-80 F for about 3 days, then into greenhouse onto bottom heated benches. Sometimes covered with row cover to hold in heat- don't worry about overheating on sunny days, melons can take extra heat.
Greenhouse Irrigation		water with wand	As needed; don't overwater.

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Optimal Greenhouse Conditions		all of our crops are together so 75-80max day temp, 60 night low temp	Melons have to share our greenhouses with other crops, so we maintain a middle ground of 55-60F at night, 75-85 daytime, low humidity, good ventilation. Melons usually get the warmest spot in the g-h. We run two greenhouses; a smaller, tighter house that stays warmer and more humid, which is the first stop for flats coming right out of the germ room, and a larger, breezier, cooler house. Melons usually move to the cooler house 2 weeks after emergence.
Hardening-off		water once a day only, move to hoop house 3-4 days before transplant.	More air movement, slightly lower temps, starting at 7-10 days before transplanting. We like them to be outside for at least 5 days, but weather sometimes is too wet/cold. 3rd & 4th plantings are easy, since they are growing in early summer.
Pests or Diseases in the Greenhouse		no	Sometimes find cucumber beetles in flats hardening outdoors- pyganic spray. We also spray on or dip muskmelons in Surround (kaolin clay) to deter cuke beetles after transplanting.
Other Notes on Propagation		better to plant later than rush into cold conditions and stress.	A problem we see too often is that melon plants at the hardening off stage can be quickly ruined by root rot brought on by cold night temps (or chilly days < 50F) combined with wet potting soil. After a cold/cool night (<45F), plants might be wilted for a few hours in the morning, especially as the sun hits them. Watch out- this can damage a planting if it repeats too often. Pull out some plants; if roots are turning brown, terminate hardening and get these flats back into a warm g-h, where they can recover. Don't water heavily in an attempt to rehydrate- the wilting is due to cold inactive roots, which won't appreciate a cold bath. Hold off transplanting until healthy white roots are re-growing.

Field Prep

Preceding Cash Crop	<u>Field:</u> Carrots, onions, beets, or peas	<u>Field:</u> depends - full year fallow with 2 cover crops OR peas/fall brassica greens <u>Hoophouse:</u> carrots or beets	<u>Field:</u> Usually carrots before our 1st planting, since field is bare over winter and we can get some weeds up and out before transplanting.
Preceding Cover Crop	<u>Field:</u> I like planting a thick stand of oats. Because the carrots, onions, beets, and peas come out early, I get a thick stand established before frost. It helps suppress some weeds, kills with the frost, and provides a 'starter mulch' for the spring.	<u>Field:</u> oats and peas winter killed <u>Hoophouse:</u> none	<u>Field:</u> Usually rye/hairy vetch for 2nd and later plantings.
Soil Amendments	<u>Field:</u> Before melons I top dress the bed with coffee grounds. For a 5' x 50' bed I may put down 40-50lbs. I use coffee grounds because they are an available, light, organic matter. This is a general addition to most of my beds to help soil tilth. I will add about a 1/2 cup of 'Chickity Doo Doo' to each planting mound 1-2 week prior to planting for a light all purpose fertilizer for the melon plants.	<u>Field:</u> compost plus during transplant and/or composted cow manure fall before, followed by cover crop. <u>Hoophouse:</u> compost plus or fertrell super K if needed	<u>Field:</u> Usually broadcast ton/a of dehydrated chicken pellets, maybe more for watermelons. And we're starting to lay bands of fertilizer like Re-Vita Pro (Ohio Earth Food) under plastic mulch, 5-600 lbs/a.
Bed Prep	<u>Field/Direct Seed:</u> In a 5' x 50' bed I will make 4-5 planting hills (depending on variety) evenly spaced. Each hill is 2' in diameter and is approximately 4-6inches higher than the surrounding soil line. If time permits I will 'crack' the area around mound with a broadfork to a depth of 14in. The rest of the bed is left undisturbed as it will be mulched with grass clippings.	<u>Field/Transplant & Direct Seed:</u> chisel plow, disk into raised beds <u>Hoophouse/Transplant:</u> BCS tiller, rake	<u>Field/Transplant:</u> Big cover crops are moldboard plowed, worked down with rotovator, disc, or Perfecta, then fertilizer is spread/laid, then another quick Perfecta pass. open field might be chisel plowed, then finished with the Perfecta.
Pre-Planting Mulch		<u>Field/Transplant & Direct Seed:</u> plastic mulch with straw mulch between then transplant into it. <u>Hoophouse/Transplant:</u> no mulch	<u>Field/Transplant:</u> All our melons are grown in plastic mulch, with a low (3-4") raised bed. Green plastic for plantings 1 & 2, black for later plantings. Single line of drip tape, 8 mil, 12" emitter spacing.
Other Notes on Field Prep		<u>Hoophouse:</u> lay drip tape by hand	<u>Field:</u> Don't overwork, mulch layer is like an additional tillage.

Field Planting

Bed Width	<u>Field:</u> 5' x 50'	<u>Field:</u> 36 inch bed tops <u>Hoophouse:</u> beds are 3 ft wide but directly next to each other	<u>Field:</u> 6' and 7'
Melon Spacing	<u>Field/Direct Seed:</u> Planting hills start 5-7ft in from the edge and are spaced about every 10-12ft. Each planting hill is 2ft in diameter and will have a total of 4 plants per hill. Plants are spaced 8-10inches apart in the hill.	<u>Field/Transplant:</u> 18 inches <u>Field/Direct Seed:</u> 12 inches <u>Hoophouse/Transplant:</u> 18 inches	<u>Field/Transplant:</u> 18" single line
Transplanting Process		<u>Field:</u> ride on water wheel, 1 person planting and one adding compost plus and covering well <u>Hoophouse:</u> make holes at given increment and place in transplants, cover.	<u>Field:</u> Waterwheel transplanter
Direct Seeding Process	<u>Field:</u> I will plant 10-12 seeds per hill. I will watch as they emerge and select the most vigorous. I find that these 'top germinators' usually translate into a hardier plant through harvest.	<u>Field:</u> same as transplanting but with seeds and no water in transplanter	
Fertility at Planting	<u>Field/Direct Seed:</u> As stated earlier I like to incorporate about 1/2 cup of 'Chickity Doo Doo' to each mound about a week prior to planting. I will incorporate this to a depth of 1ft. This amendment is necessary because my plant spacing is tight.	<u>Field/Transplant & Direct Seed:</u> about 1/2 cup compost per hole <u>Hoophouse:</u> added between tillage and raking during bed prep, not at planting	none
Water at Planting	<u>Field/Direct Seed:</u> I like the first water to be rain if possible. Seems to increase germination. If not, I like to water deeply and thoroughly up front. After germination I don't mind the plants drying as long as they are not wilting. It helps to train the plants from the beginning to go find the water. It creates a better more drought tolerant root system in the long run.	<u>Field/Transplant:</u> 30-50 gallons/400 ft bed in water wheel transplanter <u>Hoophouse/Transplant:</u> drip irrigation turned on for 2 hours to simulate about 1/4-1/2 inch of rain right after transplanting.	<u>Field/Transplant:</u> enough water to fully fill the spike holes

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Mulch at Planting	<u>Field/Direct Seed:</u> The cover crop residue is the first mulch. If possible at planting I will ring the planting hill with grass clippings for a distance of 1ft at a depth of 3-4inches. Keep that hill moist and suppress the weeds directly around it.	only applied before planting	
Row Cover		none	<u>Field/Transplant:</u> 1st planting is always covered, as soon as we can get drip irrigation going. Any crop planted into plastic mulch with floating row cover should be thoroughly irrigated right away, since a sunny day can fry plants quickly. We use 50' wide covers, ag-19, held with 1/2" re-bar and rocks and maybe some soil.
Other Notes on Planting			Melons are sensitive to root disturbance at transplanting, handle gently. If root balls tear when pulling from flat, take time to push them up and out from the bottom, through the drain hole.

Crop Maintenance

Irrigation	<u>Field:</u> I irrigate with a double dripline layed across the center of the planting hills. I use this only if plants begin to wilt and then during flowering and first two weeks of fruit growth.	<u>Field:</u> Drip irrigation as needed to simulate 1 inch of rain per week if not natural precipitation <u>Hoophouse:</u> 1-2 inches rain simulated with drip irrigation	<u>Field:</u> Mostly drip, at least an inch/week, more when hot.
Irrigation Modifications	<u>Field:</u> I like to train the plants to search out water during its vegetative growth. As the plant puts on female flowers I will supplement water as needed to ensure healthy flower development. Upon fruit set and there after I like to maintain a steady amount of soil moisture up until about 10 days before harvest. Then it can dry out.		<u>Field:</u> For muskmelons, back off as harvest draws near, which improves quality and reduces splitting. Watermelons continue to grow as they ripen, and are best when kept at least moderately moist. We like to add some overhead irrigation (traveling gun) during the month before harvest begins, since roots have filled the soil by then and can take nutrients from the entire field, not just under the plastic mulch.
Supplemental Fertility	<u>Field:</u> Rarely, I side dress planting hills with 'Chickity Doo Doo' at flowering if the vegetation is showing stress.	<u>Field & Hoophouse:</u> no, just attentive to wilting early on and during flowering	<u>Field:</u> No side-dressing

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Weeding	<u>Field:</u> I rely on 3-4in of grass clippings mulch as a primary method of suppression. I concentrate on keeping the mound clean until the plants close the bed. Up until that point I use a swan neck crescent hoe to remove weeds from the rest of the bed.	<u>Field:</u> mulch and plastic mulch (have used lilliston rolling cultivator or BCS mower between beds in past). <u>Hoophouse:</u> hoes and by hand until they sprawl a lot	<u>Field:</u> Cultivate 2 or 3 times along edges and between mulch, some hand work to clean up missed weeds. Hand pull weeds emerging through transplant holes in mulch.
Insects & Pests	<u>Field:</u> I have a problem with voles and mice hollowing out some fruit. I will usually leave one of these fruit in the field as they will prefer to feed on the one they spent so much time burrowing into. I also have a 15ft hawk pole, a few neighbor cats patrolling the perimeter, and a fox that lives in the adjacent scrub forest.	<u>Field:</u> cucumber beetles - dip transplants in surround, monitor <u>Hoophouse:</u> none	<u>Field:</u> Not many problems. Spider mites show up on watermelons every year, were very damaging in 2012 (hot, dry), but usually minor. Young muskmelons can be damaged by cuke beetles, above and below ground, but Pyganic is an acceptable control.
Diseases	<u>Field:</u> Not many. Some late powdery mildew that I do not treat. I want strong varietal resistance that can be enhanced through improved cultural techniques.	<u>Field:</u> powdery mildew - separate from other cucurbits (we have moved away from larger blocks of cucurbits). <u>Hoophouse:</u> none	<u>Field:</u> Fusarium and verticillium wilts show up right before first watermelons are ripe, and can mess up a promising crop. These diseases persist for years in soil. As our soils have become more biologically active and healthy, these wilts have become much less of a problem. Muskmelons are often damaged by powdery mildew and downy mildew, especially in later plantings. Fungicides might help with these, but they must be regularly applied before or at very first signs of disease. Also bacterial wilt, spread by cuke beetles and aphids. Sometimes, muskmelons just die, due to physiological stress of carrying a load of ripening fruit during unfavorable conditions.
Other Notes on Crop Maintenance	<u>Field:</u> Because I have narrow beds I keep the vines running lengthwise as much as possible. I keep repositioning vines up until flowering. After that moving them seems to stress the plant.	<u>Hoophouse:</u> environment controlled with roll up sides and monitored loosely, no supplement heat, no shade cloth (rarely have weather over 85 degrees)	<u>Field:</u> Muskmelons that die early produce bland, unappetizing fruit that should be left in the field. However, watermelons that die before harvest can still make good quality melons. A little sun scald will not hurt watermelon eating quality.

Harvest and Yields

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Harvest Window	<p><u>Field:</u> I anticipate a harvest window extending 6 weeks. The peak may be only 2-3 weeks. 2nd week of August to 2nd week of September seems to be my time frame.</p>	<p><u>Field:</u> Last week in August-second week in September (variable based on degree days and lasts about 2 weeks)</p> <p><u>Hoophouse:</u> same, but with a later planting date</p>	<p><u>Field:</u> Most years, melon harvest begins around July 20-25, and ends in late September.</p>
Harvest Procedure	<p><u>Field:</u> I like to harvest late in the day as the sun is going down and the temps are dropping. Usually the plants are dry this time of day. If I can time harvest after a dry period and right before a heavy rain, that is ideal. As far as identifying ripe fruit. Melons-know your variety! Some are best at full slip, some at color change, some at end softness, some when they smell sweet. I know my varieties are at peak when they come off the vine with little or no effort. Watermelons-3 signs. 1)Follow stem back to main vine. At that juncture is a tendril. If that tendril is completely dry and withered you are in good shape. 2)Turn watermelon slightly on its side to see the bottom. The spot it has rested on the ground should be fully white or cream colored with no stripes from the rind pattern extending across the spot. 3)knock it. I will cut it from the vine with a sharp pruner. Be vigilant during harvest time. If a surprise rainstorm is coming, go harvest in the dark if you need to. A bed or field full of split melons is heartbreaking.</p>	<p><u>Field:</u> mid-day once plants are dry, harvest at half/full slip, brush off any dirt (there is almost nothing because of mulch), pack into stackable bins</p> <p><u>Hoophouse:</u> similar but often late in day</p>	<p><u>Field:</u> Any time, any day. By hand, we throw or pass melons out of the field. Will explain ripeness measures in workshop.</p>
Cleaning	I only wipe off melons with a moist towel directly before sale.	cleaning not needed with mulches	We wash watermelons on the harvest wagon, in a tub of water. Muskmelons are washed in the pack shed, with a brush washer.

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Packing	I pack melons in standard black produce crates.	into cooler, then packed into CSA boxes or taken to market	Watermelons are handled in wood bins. Stored on farm in 1000 lb bins, sold to stores in 600 lb bins or 50-60 lb plastic crates. Small types like Yellow Doll are also sold in 50-60 lb plastic crates. Muskmelons brought from the field in bins, then mostly sold in 50 lb crates after washing, some in 600 lb bins.
Storage	I store melons in a relatively cool location, out of direct sunlight, with some airflow.	bulb crates or deep crates for 3-4 days maximum	Watermelons stored at 52-55F, for 2-3 weeks. Muskmelons at 35F, for up to a week before washing, grading and selling.
Yields	<u>Field:</u> A good estimate for my system would be about 1-1.25lbs per sqft of bed space. I am experimenting with trellising which will have the potential for more.	<u>Field:</u> estimated 2-3 lbs/bed foot. About 500 melons/400 ft bed <u>Hoophouse:</u> similar but heavier melons, fewer seconds	<u>Field:</u> Red seeded watermelons: 10-12 lbs/row ft in 1st & 2nd plantings, maybe 7-10 lbs/ft later Small yellow doll types: 8-10 lbs/ft, again less in later plantings. Muskmelon yields: about 5-8 lbs/ row ft.
Other Notes on Harvest and Yields	I think yields suffer when you have unfavorable weather conditions for pollinators during flowering. If you have a long stretch of cool temps, rain, or wind, production will be decreased. Also for the most part melons prefer heat. Quality and production seem to increase. Extremely high temps at fruit set can cause fruit to abort and stimulate male flower production.	we pick frequently once in season at least every other day.	

Marketing

Markets	Direct Sale through neighborhood network	CSA, farmers market, direct to restaurant	CSA, direct to grocery
CSA		4 melons/season for full shares 2-3 for small shares	7-8 boxes with melons; 3 muskmelons, 4-5 watermelons.
Farmers Market Prices		\$2/lb each or \$3 for small "mini" melons	
Direct to Grocery Prices			45¢/lb for red seeded watermelons, 70¢/lb for smaller types like Yellow Doll. 75¢/lb for muskmelons
Direct to Restaurant Prices		\$2/lb	
Other Markets	Small melons are \$1.50/lb or \$3/each. Watermelons \$8 for 8-10lb and \$10-12 for >10lbs.		