

Beets



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Troy Farm

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Location	Madison, WI	Fond du Lac, WI	Atlanta, IL
Acres in Vegetables	2	7.5	35
Total acres in beets	0.2	0.2	3

How these tasks are done for Beets:

field prep/tillage	with a walking tractor	with a tractor	with a tractor
hoophouse prep/tillage	with a walking tractor	do not do this task for beets	with a walking tractor
creating stale seed beds	with a walking tractor	do not do this task for beets	with a tractor
direct seeding	do not do this task for beets	with a tractor	with a tractor
transplanting	by hand	do not do this task for beets	with a tractor
cultivating	by hand	with a tractor	with a tractor
spreading amendments	by hand	with a tractor	with a tractor
laying irrigation lines	by hand	by hand	by hand
laying row cover	by hand	do not do this task for beets	do not do this task for beets
spraying for pests, diseases, weeds	by hand	do not do this task for beets	with a tractor
harvesting	by hand	by hand	with a tractor
topping	by hand	by hand	with a tractor
bagging	do not do this task for beets	by hand	by hand
farming style	certified organic	certified organic	certified organic

Propagation

Varieties BUNCHED beets	Boldor Yellow Beets, Ace Red Beets, Chioggia Beets	Red Ace F1 Badger Flame (gold beet- trying in 2020)	Red Ace, Chioggia, and Boldor
Varieties STORAGE beets	Ace	Red Ace F1	Red Ace, Chioggia, and Boldor
Soil Mix	Vermont Compost	n/a	CowsMo Compost Double Red Mix
Seedling Trays	Paper Pots	n/a	128's 1 seed per cell
Propagation Schedule	Field: Seed from end of March to beginning of July in paper pots in the greenhouse. Plant in the field 3-4 weeks after seeding	Field: Seeding Dates Red Ace: 4-20, 6-15, 7-13 Badger Flame: 6-15	Field: seed field transplanted beets on 2/20 Hoophouse: hoophouse transplanted on 2/7



	Troy Farm	Park Ridge Organics	PrairiErth Farm
Germination	Transplanted: in germination chamber	Direct Seeded: Nothing specific for beets. Proper planting depth (not too shallow), not too dense (compound seed) and good moisture during radical/shoot development.	Transplanted: We plant deep enough so seed is covered with potting mix, press flat firmly once covered. We will water in with Rootshield WP to lessen damping off. We will place in germ chamber for 2-3 days at 80 degrees, then move to radiant heat bench tops so seedlings have immediate access to light once they pop so there are no issues with leggyness.
Greenhouse Irrigation	Transplanted: We use a watering wand and water 1 to 2 times daily.		Transplanted: by hand as needed
Greenhouse Conditions	Transplanted: The germination temperature and humidity is the most important. Otherwise we just always start them in the greenhouse and harden them off for a week before transplanting outside. When our main greenhouse starts to get too hot, we start growing things in our smaller hoophouse with shade cloth.		Transplanted: Manually vent greenhouse by rolling up sides or opening doors
Hardening Off	Transplanted: We aim to harden transplants off 1 week prior to transplanting by taking them out of the hoophouse and placing them outside in full sun - preferably moving them outside toward the evening.		Transplanted Hoophouse: We don't harden off hoophouse beets. Transplanted Field: For field we will set out on wagons 3-5 days before taking to the field
Greenhouse Pests or Diseases	None		Transplanted: Mice like to eat beet seeds. Set traps on top of flats and cover with plastic till beets begin to emerge. Damping off we control with root shield early and then if it becomes a problem later we switch to double nickel once germinated.
Other Notes on Propagation		We have more success with pelleted beet seeds. With raw beet seed we seeded too heavy all the time making the beet stand never size up and tops weak from competition.	

Bed Prep

<p>Preceding Cash Crop</p>	<p>Field: Greens or cucumbers</p>	<p>Field: Varies. Anything after the first planting (three total) will likely be following a short crop like lettuce or spinach. Final planting would likely follow spring peas or a spring brassica.</p>	<p>Field: Head lettuce radishes or other fast growing crops where no weeds have gone to seed Hoophouse: Over wintered greens and summer tomatoes</p>
<p>Preceding Cover Crop</p>	<p>Field: Peas and Oats</p>	<p>Field: If cover crop was planted in area slated for beets, it would typically be an oat and vetch mix from the late summer/fall the season prior. We don't have a planned cover crop rotation involving beets. We focus our cover crop rotation on heavy feeding crops.</p>	<p>Field: For beets seeded before July, fall buckwheat or oats and peas For fall beets we plant Rojo Mustard as soon as the soil can be worked in the spring as a bio fumigant. As it begins to flower the plant has it's highest levels of glucosinolates. We flail mow and rotovate in, as the debris breaks down it releases mustard gas essentially that helps fight pathogens that lead to damping off from direct seeded beets in July when soil temps are high. Hoophouse: none</p>
<p>Soil Amendments</p>	<p>Field: 1 ton of chicken pellets mostly for nitrogen. The soil I am currently farming is well balanced from a mineral standpoint</p>	<p>Field: Haven't in the past but might consider for 2020 due to issues with nutrient deficiency (or disease?).</p>	<p>Field: 600 lbs of chicken pellets. Best all around fertilizer providing NPK needed for growing healthy beets. We will apply 3-5 lb of boron foliar spray at 4-6 leaves. All rates per acre. Hoophouse: We apply 600 lb to the acre equivalent to each bed by hand. We also apply compost from CowsMo in the spring.</p>
<p>Stale bed, Occultation, or Tarping</p>	<p>Field: Right now we just chisel plow if necessary, add chicken pellets and work the soil 2-4 inches deep with the power harrow. Then we wait two weeks for weeds to germinate and run the power harrow again to knock them back and prepare the soil at the same time for transplanting. We would like to experiment more with simply using a flame weeder after 2 weeks or possibly tarping for 3-4 weeks prior to transplanting.</p>	<p>n/a</p>	<p>Field: We try to have beds formed a good 4 weeks ahead of time. Each week or after a rain event we shallowly stale seedbed to drain the beds of weed seeds. Hoophouse: none used as we're transplanting in early March. We use a hand flex tine weeder and a Japanese Torsion Weeder from John Hendrickson</p>

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Bed Prep	<p>Field: If the field needs it, we chisel plow first and ideally we add chicken pellets and work the soil 2-4 inches deep with a power harrow or use a rototiller if the vegetation is thick. We then allow the weeds to grow for 2-4 weeks, depending on how much organic matter there is to break down, and then power harrow again to kill weeds and prep the soil for transplanting. If we fall down on stale seed, we simply do the first step and plant right away if there isn't much residue. Luckily the beets usually outgrow weeds pretty well when being transplanted if we can't do a stale seedbed.</p>	<p>Field: Typically tilled within 1-2 days of seeding. We use a Frontier (John Deere) rotary tiller for all field tilling. Makes a nice smooth seed bed, sometimes too fluffy depending on soil conditions at the time. With pelleted seed size, residue from previous crop doesn't help but can handle it okay.</p>	<p>Field: In the fall we will try to pre bed areas where we want to direct seed beets as soon as soil can be worked. We will use our Sutton Ag prototype combination seed bed prep tool to work the soil as shallowly as possible to not bring up any weed seeds in the final tillage pass before seeding. With this machine we can accurately set the depth from .5-1"</p> <p>In the spring we will either rotovate to incorporate a cover crop and then depending on how much debris is left in the field rotovate again or make a pass with a field cultivator before forming beds with a buckeye bedshaper.</p> <p>Hoophouse: We rototill with a BCS and then rake out the aisles to form beds.</p>

Planting

Bed Width	<p>Field Transplanted: 30 inch bed top. 48 inches from bed top to next bed top</p>	<p>Field Seeded: 60" beds</p>	<p>Field Transplanted: 53" bed top 6' centers</p> <p>Field Seeded: 53" bed top 6' centers</p> <p>Hoophouse Transplanted: 4' centers</p>
Plant Spacing	<p>Field Transplanted: 10 inches between rows, 4 inches between beets.</p>	<p>Field Seeded: 15 inches between rows, 3 rows per bed, 15-20 pelleted seeds per foot (occasionally thinning is needed)</p>	<p>Field Transplanted: 6.5" between plugs, 15" between rows</p> <p>Field Seeded: 1 seed every 1.5"</p> <p>Hoophouse Transplanted: 9-10" rows, planting a plug every 3-5" by hand depending on the number of beets in each plug</p>

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Seeding Process		Field Seeded: 60" bed width (5 feet on center). We use 3 Planet Jr seeders on a tool bar belly mounted on Allis Chalmers G. Hole size depends on seed size which can vary across seasons. But typically around #22. Goal is to get 15-20 seeds per row foot. We have a direct seed plan book and planting log/map on tractor when direct seeding along with back up seed in our super duper handy square tote attached to the front middle of the G.	Field Seeded: We seed with a MaterMacc MSO seeder. We try to have 1 person following behind especially on large plantings of beets to make sure we are not running out of seed.
Field Germination		Field Seeded: Water with water reel if needed. Typically only applies to the July seedings.	Field Seeded: We monitor soil moisture. If the soil is dry we will set up irrigation on beds that have been recently seeded. It is important to not overwater in the summer as this can lead to damping off issues. 2 days after seeding we will apply Rootshield Plus WP to direct seeded field beets to try to combat any potential issues with damping off.
Thinning		Field Seeded: If we thin, which we try not to have to, it would be by hand at the same time as hand weeding (~3 weeks after planting).	Field Seeded: We don't thin. If we have a thick stand we will finger weed early and that has been successful in preventing crowded beet rows.
Transplanting Process	Field Transplanted: Work the soil with the power harrow. Mark 3 rows in the bed with bed rake. Place paper pot transplanter in 1 row and run out paper pot tray. Replace with another tray and continue process until all trays are planted. We try to make rows even so beets stay together in field. Plants need to be irrigated immediately unless planted late in the evening and rain is expected.		Field Transplanted: Mechanical 5000 is how we transplant in the field Hoophouse Transplanted: We transplant by hand in the hoophouse. Rows are marked with a seeder then we plant by hand.
Water at Transplanting	Field Transplanted: Beets are planted with a lot of other transplanted and seeded crops and everything is watered using overhead sprinklers. We water .5 to 1 inches worth over the entire planted area.		Hoophouse Transplanted: Wobblers Field Transplanted: The transplanter puts down a splash of water each time it ejects a plant. We will follow with a water reel to water in the transplants.

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Other Notes on Planting		<p>Field Seeded: In past years, we have used raw beets seed as a marker in our field carrots. A handful of seeds per hopper when seeding. They came up first which made for easier carrot cultivation. The unexpected result was beets with great top growth which made for super nice beet bunches for market sales. We are not continuing with this technique because we now flame weed carrots ~7 days after planting which ends up burning off the beets.</p>	

Crop Maintenance

Irrigation	<p>Field: We irrigate as necessary with overhead irrigation. We try to provide about 1 inch of water to our plants a week. Usually transplants need 2 watering of .25 to .5 inches within the first 3 days after transplant unless rain is in the forecast</p>	<p>Field: We irrigate from two standard wells on the property. For direct seeded crops, we use a Kifco Water Reel when needed. Typically only in very dry conditions would be water beets. They might be lucky to get 1 inch a week when we are actively trying to keep everything alive on the farm including ourselves.</p>	<p>Field: We monitor the soil moisture and irrigate with a water reel to apply 1" of rain equivalent water. We try to water in the afternoons so leaves have a chance to dry to reduce disease. Hoophouse: Wobblers, time varies on what time of year but typically trying to simulate 1" of rain.</p>
Changes to Irrigation		<p>Field: We would only worry about watering beets during the first few weeks of their lives and only if it is really dry OR when we are trying to size them up faster for a quicker harvest date.</p>	<p>Field: By mid September we stop irrigating. Hoophouse: We don't irrigate as frequently when beets are nearing maturity in May. Mainly to prevent over sizing.</p>

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<p>Weed Control</p>	<p>Field: We use wheel hoes and stirrup hoes for weeding between rows. We don't bother with in row weeding most of the time.</p>	<p>Field: 3- row Basket Weeder 2+ times during the first couple weeks after planting. Once plants are established (and weeds) we use a 3-row beet knife cultivator 2-3 times throughout the remainder of season. Hand weeding usually occurs once at about 3-4 weeks post planting date.</p>	<p>Field: Flaming is difficult because most broadleaf weeds germinate at the same time as beets. For fall, good planning and forming beds well in advance to drain the weed seed bank before planting is best. For spring, planting early to get direct seeded beets up before many summer annual weeds is key. Having 4 true leaves by the first week of May from direct seeded beets is important.</p> <p>Once beets emerge, we use Steketee Ridge Cultivators from Sutton Ag to cultivate within 3/4" of the row on each side. Depending on growth rate we can maybe cultivate once more with this setup. Once true leaves are established, we use our other Steketee Parallelogram setup with A Blades. During the first pass with this setup I will not engage the finger weeders. With the right tractor speed I get a very light hilling action and can cover up small weeds in row. Once there are 4 true leaves I will use the same setup with fingers until they are 30 days old. Usually after the first pass with fingers we try to hand weed. As the beets grow and roots are swelling I stop using this setup and go to sweeps on a Super C. The sweeps are set farther apart but we travel much faster through the field and throw much more dirt into the row and can cover up weeds just germinating.</p> <p>Hoophouse: We use wheel hoes between rows and the Japanese torsion weeder in row. Hand weeding occurs once in early April.</p>
<p>Insects and Pests</p>	<p>Field: If we let the field get too weedy, there are too many spots for chipmunks to hide and they start taking bites out of the beets.</p>	<p>Field: No real pest problems on beets.</p>	<p>Field: Deer. We use a 3d fence that is baited to keep deer out of fields with beets.</p> <p>Hoophouse: Rabbits have been a problem in the past when they find their way into the hoophouse. Freshly transplanted beets in early March they find irresistible.</p>

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Diseases	<p>Field: Cercospora Leaf spot occurs on beets that are in the field too long. If we harvest in a timely manner, it can be avoided. Otherwise, we just tolerate it.</p>	<p>Field: Cercospora beticola. Haven't done anything to manage. Should probably tune into crop rotation more to avoid Chenopodiums (spinach). Typically the leaf damage doesn't hinder our harvest of topped beets (shares and storage). It effects our bunched beets for market.</p>	<p>Field: Cercospora is the biggest problem. Especially in wet and humid conditions. Sarah Jane Pethybridge at Cornell is a Beet Specialist and has been working on a Cercospora forecast that is emailed weekly. She has also found a spray program that has had some success with Certis chemicals Double Nickel, and Cueva. The Certis rep Anne Webster is a good resource as well. She will be a vendor at this conference and MOSES. She has steered me to add applications of Lifeguard twice in the first 30 days. Using these programs we have had better quality tops but still experienced a lot of cercospora pressure in September and had significant die back towards the end of the month.</p> <p>The best looking beet tops were planted on August 8th, over 3 weeks later than we want to get beets in. Yield was better per bed foot than our earlier beets planted in mid July and they had robust tops through October. Red Ace seems to still stand cercosopra pressure the best, even over Merlin and Boro who claim to be resistant. I am excited to try new Bejo beets that are suppose to have improved resistance.</p> <p>Hoophouse: We have not had many disease problems in the hoophouse. CLS is a problem in the field in the fall but we have never experienced it in the hoophouse.</p>
Hoophouse Environment			<p>Hoophouse: Once temps are typically above freezing at night we usually leave the hoophouse that has our carrots and beets in it open 24/7. If nights will be cold we will vent mid morning on sunny days and close a few hours before dusk.</p>

Harvest and Yields

<p>Harvest Window</p>	<p>Field: We harvest at about racquetball size. It takes 2-3 weeks to harvest. After 3 weeks, quality deteriorates. Harvest starts in late June and goes through October.</p>	<p>Any beet is deemed harvestable when it is racket ball size or larger. A single planting will be harvested over a long window of time (often too long). We typically start harvesting beets in late June and end the first week of November (three plantings total).</p>	<p>Field: Transplanted beets are ready by early June, then direct seeded ones are ready by late June. By early July we are able to sell bulk beets to all wholesale customers. Once tops get CLS and bunching takes longer, we transition to all bulk beets by late July. If fall crops are disease free we will thin some by bunching beets for markets or CSA. We aim to have beets out of the ground and in storage by the third week of October. Then we sell from storage till we are out. Hoophouse: We start selling bunched beets in early May. Full window is May-October</p>
<p>Harvest Procedure BUNCHED</p>	<p>We harvest beets a couple of days before market in the early morning if possible, though they can hold up to heat as long as we don't push harvest into the afternoon and make more frequent trips to the wash/pack house when the day gets hotter. Beets are banded and therefore the number of bands needed are counted before hand and distributed to harvesters. Beets are picked individually for proper size. As the harvester goes down the row, they pull the beet from the ground, pull off bad leaves, and hold the good beet in one hand. Each additional beet harvested goes through the same process and is added to the other hand until a good bunch size is obtained. 4-6 beets make a bunch depending on size. The bunch is banded and laid on the ground. Bunches are later picked up by someone dragging along a black harvest crate and filling it up with roots facing the handle edge of the crate.</p>	<p>Any beet is deemed harvestable when it is racket ball size or larger. A single planting will be harvested for bunched beets many times (7-8 times) before a final bulk harvest for topping and storing. For bunches, beets are harvested and piled up in the field. Bunches are made in the field and put into bulb crate for transport to the pack shed. The Crew removes "squiggles" from the beets after harvesting into piles (dead brown leaves and stem bits) and then bunches in the field. We group beets of the same size together in a bunch for better cook-ability. Ex: 3 huge beets in a bunch or 7 smaller beets in a bunch, never 5 mixed size beets in a bunch. We use #63 red rubber bands from Glacier Valley.</p>	<p>We bunch beets early to capture retail and wholesale customers and retain them through the season. The first bunched beets may be golf ball size or smaller and have 4-5 beets per bunch. As the beets grow, bunch size goes down to 3 beets. Beets larger than a baseball are left in the field for bulking out. Before the crew arrives I make sample bunches with different beet sizes. The crew examines the samples for beet counts and weight before they start. People spread out in the wheel tracks and work from one end of the bed to the other. Leaves are lifted to see the roots, beets of the right size are pulled, bad leaves are pruned off, and the next beet is selected. Complete bunches are banded with a twist tie close to the shoulder of the beets. Bunches are placed on the ground in piles of 5. One person boxes and counts 25 bunches to the harvest bin. Full bins are counted while in the field. Once the correct number of bunches is harvested all the boxes are loaded onto the truck and moved to the pack shed.</p>

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<p>Cleaning BUNCHEDED</p>	<p>Beets are usually hydrocooled and dumped on a screen where each bunch is sprayed clean and then usually directly placed into a storage bin to go into the cooler. Hydrocooling is sometimes skipped if the weather is cool enough. If the greens are very dirty, the whole bunch may get dunked before being placed in storage container.</p>	<p>Once bunches are brought to the pack shed, they are submerged in a bulk tank. From the tank, each bunch gets washed in a bunch washer.</p>	<p>A NestaFlex is strung out to its full length. A pallet of bunched beets is wheeled to the NestaFlex at one end. Boxes of dirty bunched beets are placed on the NestaFlex. In the middle of the NestaFlex where the line of beets starts a pallet of empty clean green bins (or wax boxes) is wheeled to that location. A hose is pulled over with a jet nozzle on the end, a box full of bunched beets are pulled into position on the NestaFlex to the left of the person washing (if right handed) then an empty box (wax or plastic depending on the situation) to the right. The washer pulls a bunch out from the dirty bin, sprays all the dirt off the roots, if greens have dirt on them they will get a quick spray too. Then once clean the beets are placed in the clean box. Once the box is full the next box of dirty beets is rolled into place and the full clean box is rolled away and a new clean box is placed on the NestaFlex and the process continues.</p>
<p>Packing BUNCHEDED</p>	<p>See cleaning procedure.</p>	<p>Washed bunches typically go into a disinfected plastic tote or a disinfected bulb crate. We use Oxonia for disinfecting surfaces (totes and crates)</p>	<p>Beets are placed in piles of 5 after they are bunched then packed into harvest totes 25 at a time. They are brought back to the packshed where they are washed a bunch at a time by hand. If going to wholesale they are packed direct into wax boxes, or CSA/market are packed back into clean harvest bins. All bunched beets are then wheeled to the cooler and put on pallets with other crops that are going to the same destination. At the end of each day, pallets are covered with large bags to keep humidity levels high.</p>
<p>Storage BUNCHEDED</p>	<p>Attached lid containers are used for storage. Cooler is kept at about 36 degrees fahrenheit</p>	<p>Totes are stored in the cooler at about 38 degrees. If bulb crates are used, a plastic 60 gallon bag is placed over the stacks (6 crates high) to prevent top wilting.</p>	<p>Bunched beets are stored in wax boxes or green harvest containers at 35-38 degrees. They are always covered with a plastic bag to lock in moisture and prevent dehydration.</p>

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Harvest Procedure BULK	Beets with proper size - racquetball size or larger - are pulled from the ground, tops are twisted off, and beets are placed in black bulb crates.	Bulk beets are typically harvested when the planting has been combed through enough times for bunches or when we need beets for share boxes. Beets of racket ball size or larger are harvested and either topped in the field with a red harvest knife right at base of leaves OR brought to the pack shed to be topped in our house made topper machine (onion topper design). Beets harvested for long time storage (final harvest in fall) we have found that the knife topping is better for limiting regrow in storage.	<p>Beds that are picked over for bunched beets are harvested by hand. The crew is told to pick all beets and top them from golf ball size and up. The crew twists tops off places them in 25 pound baskets then dumps them into a pallet bin lined with a plastic bag. Bins are removed from the wagon at the packshed with a forklift and placed in the cooler.</p> <p>When we are growing beds for bulk harvest we harvest with a mechanical harvester from Simon that dumps beets into bins on the machine. 3 people can operate the harvester. The machine carries 3 bins at a time, we line bins with large bags to keep moisture in during storage. The machine pulls and tops the beets, a rider pulls culls and operates the boom and fall breaker. Once a bin is full it is dumped in the field. Bins are then loaded onto a trailer and taken to the packshed where they are unloaded with a forklift and then placed in the cooler.</p>
Topping BULK	Twist off top by hand. Do not remove root	A topper machine was built for us and was designed to top onions. It works for beets as well but leaves a jagged removal which is okay for short term storage but not good for long term storage. The topper decreases topping labor time but about 50%.	<p>If done by hand we try to encourage crew members to pull 2-3 beets at a time and get all greens or dead leaves in one hand, then with the other hand twist the roots off from the tops. Doing this over a harvest container and letting the beet root fall into a bin. If for long term storage beets will be dumped into a pallet bin, if we are picking for an order specifically for 500 lbs or less they will be left in their harvest bins and taken back to the pack shed on a pallet for washing.</p> <p>For large harvests all harvesting is done with a Simon harvester that pulls, tops, and dumps them into bins.</p>

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Cleaning BULK	Lay on screen and spray while moving around with other hand.	After beets are topped, we dump them into our barrel washer. About 100lbs at a time. Our washer is loaded from the side (verses ends like most I have seen) and has a closure mechanism so the beets are contained and rolling until we decide they are clean enough.	A bulk bin is wheeled with a pallet jack to the end of the brush washer. A packing cart is wheeled to the other end with bags, labels, ties, and scales. One person feeds beets onto the feed in belt. The beets go through the brush washer and come out on a round table. 2-3 people bag and weigh beets, a knife may be required to cut stems or bad leaves from the shoulders of the beets. Once a bag is filled to 25 pounds it is pulled off the scale, tied and labeled. Then the bag is set on a pallet. Once the pallet is full, it is wheeled back to the cooler. We will also place washed beets back into clean harvest bins to pack smaller orders. A different pallet is grabbed and instead of bagging, beets are placed in a bin after shoulders have been cleaned of bad leaves.
Packing/Bagging BULK	Place in attached lid containers for storage. Bag in 1-2# bags for sale.		We get vented 16"X32" 3 mil bags, we use a 4" PVC Coated wire tie with a blitz tool to quickly seal a full bag.
Storage BULK	Same as bunched beets	Bulk beets are stored in the cooler (~38F) in clean bulb crates (~45lbs per crate) in a 6 stack system with a plastic bag from the bottom and a bag from the top. Stacks are clearly marked using our I.D. system. EX: BEET-2-10/29 (Crop-field#-Harvest Date)	We store bulk beets at 35-38 degrees. In bulk bins they are stored dirty, a bag is lined on the inside of the bin then a new bag is laid across the top. Once clean pallets of bulk beets in harvest bins are stored in stacks with a bag covering them so they don't dry out.
Maximum Storage Time	BUNCHED: 1 week BULK: 2 months	BUNCHED: 1 week BULK: 5 months	BUNCHED: 1 week BULK: 6 months
Quality Grading	The only seconds are beets with bite marks taken out or severely deformed beets.	Find as many racquetballs in the compost pile as possible to have around the farm for examples of minimum beet size so that people just know it like a 6th sense. No grading beyond size. We also usually end up with some JUMBO beets that we try to wholesale.	Any splits or harvester damage are culled out. We sell to juice companies and usually they will take them if they are not too small.

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Yields	Field: BUNCHED 40-50 bunches per 100 foot bed BULK about 60# per 100 foot bed	Field: About 1lb yield per foot planted. On a 2000 ft planting we yielded 1700 lbs topped and 300 bunches in 2019.	Field: Spring beets yield 1 lb per row foot. Fall beets have been highly variable due to CLS, with an average of .50 lb per row foot. Hoophouse: 1 bunch per row foot

Equipment

General	Paper pot transplanter and paper pots. \$2800 starter kit for system and \$3.25 per 90 row feet.	Barrel Washer: New \$3k-\$4k, Used <\$3K ? Bunch Washer: New ???, Used \$1k Onion Topper: New \$4k, Used Priceless	Steketee Ridge cultivator \$900 per row Steketee Finger weeder and parallelograms 3 row setup \$6000 Simon top lift harvester \$35,000 Scott Viner (similar to Simon) \$12,000 Brush Washer \$2000 used, \$6000 new Double Loop Wire Ties \$50 per 5,000, Blitz wire tie tool \$22
Biggest Impact	When it works well, this system saves a lot of time in transplanting labor and ensures a full stand that can out compete weeds.	Barrel Washer because of number of crops it can wash and quality of the washed product.	Steketee ridge cultivator, we can cultivate up to .75" away from the crop on each side of the row as soon as crop emerges.

Marketing

Markets	CSA, farmers market, on-site farm stand	CSA, farmers market, on-site farm stand, direct to grocery, direct to restaurant	CSA, farmers market, direct to grocery, direct to restaurant, wholesale through a distributor
CSA		Typically we use a 2lb bag as our share unit. When offering for the first time, we may offer bunches if time and space in the share box allow. Our members shares are based on preferences they set and beets are either a "love them" item (get double) or "hate them" item (never get them). We try to offer them every other week in the standard season, and in each of our Extended Season Shares (EOW November and December).	Usually one bunch or two pounds bulk.
Farmers Market	\$3/bunch	\$4/bunch, 2 for \$7 \$5 for a 2 lb bag of beets	\$3.50 per bunch \$2.25 per pound bulk
Direct to Grocery		\$2.10 per pound bulk, \$3.25 per bunch	1.50 per pound or 35 for a 25 lb bag
Direct to Restaurant		\$2.10 per pound bulk, \$3.25 per bunch	2.00 per pound
Wholesale to Distributor			35 for a 25 lb bag
Seconds or Juice		\$1.50 lb for large beets	\$.80 per pound. Takes 150-200 lb/week. Can have less trimming and be in rougher shape as long as they are baseball size and up.