

# CABBAGE

**Steven Shoemaker**  
 Steadfast Acres

**Lincoln Fishman**  
 Sawyer Farm

**Ben Jackle**  
 Mile Creek Farm

| Location            | Lone Rock, WI | Worthington, MA | New Lebanon, OH |
|---------------------|---------------|-----------------|-----------------|
| Acres in vegetables | 4.5           | 5               | 12              |
| Acres in cabbage    | 0.25          | 0.5             | 0.25            |

## How these tasks are done for Cabbage:

|                             |                   |  |                                 |
|-----------------------------|-------------------|--|---------------------------------|
| field prep/tillage          | with a tractor    | with a tractor                                 | with a tractor                  |
| transplanting               | with a tractor    | by hand  | with a tractor                  |
| cultivating                 | with a tractor    | do not do this task for cabbage                | with a tractor                  |
| mulching                    | with a tractor    | by hand  | do not do this task for cabbage |
| laying irrigation lines     | with a tractor    | by hand  | do not do this task for cabbage |
| laying row cover            | by hand           | do not do this task for cabbage                | do not do this task for cabbage |
| spraying for pests/diseases | by hand           | do not do this task for cabbage                | with a tractor                  |
| harvesting                  | by hand           | by hand  | by hand                         |
| farming style               | certified organic | organic practices, not certified & no/low-till | certified organic               |

## Propagation

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| Varieties | Spring: Green Presto (early maturing and uniform), Tendersweet (nice flat heads that can get big, but a little variation in size allows for smaller heads also), Famosa (great looking savoyed leaf)<br>Fall: Ruby King (currently looking for a disease resistant alternative), Passat (probably switching back to storage no.4 because these heads are too big for us to market), Famosa - (sizes up nicely in our fall slot) Fast Vantage (nice, uniform, smaller head, fast growing fresh eater) | Napa -- Minuet<br>Early and mid-season green for fresh eating -- Caraflex<br>Green for storage -- Storage #4<br>Red for storage -- Ruby Perfection | Farao, Primo and Crystal Vantage and Caraflex (only in Spring)<br>The vantage series cabbages are our favorite, but the Farao provides one more, earlier maturity date which is especially nice in the spring. An issue that we have run into in the last couple of years is desiccation and scarring of inner leaves due to high heat during periods of heavy vegetative growth. I'm not sure if other varieties would be less susceptible, but if we continue to see this issue we may look for other varieties. |
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| Black Rot Resistance | Seems like Green Presto, Passat, and Ruby King show black rot resistance, but we don't really see a lot of black rot   | Black rot has not been an issue for us, except occasionally in Napa.   |  |
| Seed Treatments      | no seed treatments done in house   | None   | None   |
| Soil Mix             | We have used Cowsmo green label or red label mix. Switching to Ohio Earth Foods, will likely mix the standard mix with the seed catapult mix.  | McEnroe Organic Premium Lite Growing Mix   | Ohio Earth Food Seed Catapult  |
| Seedling Trays       | We seed into 72cell black plastic square plugs for our spring planting (they tend to be in flats longer) and 72 cell black plastic round plugs for our fall plantings; 1020 size on both. We don't pot up.   | Early production Minuet and Caraflex are seeded directly into black plastic 72 cell trays, two seeds per cell, because we only plant a couple hundred of each of these early varieties. Those starts go into holes in woven ground cover on the permanent no-till beds.<br>We grow ~5000 heads of storage varieties seeded into black plastic 288 trays with a friend's vacuum seeder. One seed per cell. They are up-potted into various pot sizes as we experiment with clover plantings. We've tried everything from 128s to 2.25" square pots. For mechanically transplanting cabbage into clover, 72s play best with the transplanter. For hand-planting into clover, because it's gentler, 2.25" starts seem to have increased yields, but that yield may not be economically justified due to requiring more potting mix, greenhouse space, and transplanting time. | proptek 231 deep   |
| Propagation Schedule | Spring Planting block is seeded first week of April and transplanted 35 days later and immediately row covered. Fall block is seeded around the second week of May and transplanted about 28-32 days later (roughly 5 days from the plugs pulling freely) We have just started doing a late season fast maturing and fresh eating planting around the first week of July and transplanted about 28-32 days later | Early cabbage production<br>seed 4/1; transplant 5/7-5/15<br>Summer successions follow the same 5-7 weeks from seeding to transplanting.<br>Storage cabbage production<br>seed 5/1-5/7; up-pot 5/21-6/1; transplant 6/15-6/21  | Seeding dates: week 13 (week of March 21) and 27 (week of June 27)<br>Transplanting dates: late April in the Spring and first week of August in the fall |

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| Germination                  | We prime the spring planting in 80 degree germination chamber for 2 days then set out in greenhouse. Fall planting block just gets set out in the greenhouse.  | The early brassicas we buy in because we can't justify heating a greenhouse. The main storage plantings, seeded in early May, require no additional heat.   | Spring: germ chamber set to 76 degrees, ~3 days<br>Fall: stack watered flats in barn under tarp (usually ~75 degrees at this time of year) until first sign of germination then down to greenhouse   |
| Greenhouse Irrigation        | We hand water on an as needed basis: full watering of the greenhouse first thing in the morning and usually 3hrs later (just before lunch) then spot watering the rest of the day as needed  | We hand-water everything in the starts greenhouse with a wonder waterer. Watering (or a moisture check, at least) occurs right when the workday starts, right before (and right after lunch, depending on whether watering was needed pre-lunch), and towards the end of the workday.<br>On very hot days, we sometimes use overhead mist irrigation. | Dramm orange mister when germinating and in cotyledon stage then shower head. as needed, monitored usually twice per day (lunch, evening)  |
| Greenhouse Conditions        | Cabbage seems to be pretty forgiving for us. We keep the night temp around 50 in the spring and exhaust fans on at 90. Doors open during the sunny days and interior fans going all the time for good air flow. Definitely make sure to rotate trays because the edges always dry out fastest.   | We don't do much fussing. Once the starts are up nicely, we move them to outdoor tables. If there are any extreme storms, we will move them back into the greenhouse.   | We haven't had an issue with cabbage germination/seedling growth so we don't generally treat them with any particular strategy. In the spring greenhouse night temps are 50 degrees and during the day the ventilation fans come on at 80 degrees and will maintain that temp. During the summer shade cloth and roll up sides help keep temps cool, but it is definitely warmer than optimal. |
| Greenhouse Pests or Diseases | No real disease issues to speak of. Our later plantings will sometimes see cabbage loopers which we either hand remove or spot spray with entrust depending on the number we are seeing.   | None  | None. When we used Vermont Compost Company mix we'd have some over saturation issues. With Seed Catapult the mix dries out much quicker so this is not as much of an issue. But over the years we have also changed our strategy on greenhouse watering to mainly avoid overwatering and avoid watering in the afternoon, especially in the spring.  |
| Hardening Off                | In the spring we bring the flats out around 28 days after seeding or when the plugs pull from the flat. Then we set them outside for about a week before transplant. We move our fall planting out around the same time after seeding, but don't necessarily wait the full 7 days before transplanting because they seem to ready at 4-5 days or so. | Cabbage automatically gets moved out of the greenhouse as soon as it has a healthy, sturdy habit, and so generally has multiple weeks to harden off.  | 5-7 days we'll move cabbage outside with other brassicas. In the warm summer temps we'll aim to move out cabbage on the younger side in order to slow growth and keep from getting too leggy with warm temps and shade cloth.  |

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**Bed Prep**

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| Preceding Cash Crop  | <p>We are just getting ready for our 5th season on this land, so still dialing our rotations. Our goal is have our fields be cover cropped the year preceding Cabbage/Brassicas. We have been slowly expanding our field options so roughly half of our ground is resting cover cropped. The only year there was a preceding cash crop, it happened to be cucurbits.</p> | <p>Early production cabbage on woven ground cloth generally follows a heavily mulched garlic crop, or a fallowed bed that had mulch applied the previous year.<br/>For clover production, I just avoid following another brassica.</p> | <p>We usually put brassicas after a preceding plasticulture crop. These would be either cucurbits or solanums.</p>  |
| Preceding Cover Crop | <p>Prior to spring cabbage we like to have winter killed Pea Oatlage. Prior to our fall cabbage planting we like to see a season of summer mix (sudan grass, sunn hemp, sunflowers, Japanese millet, cow peas, soybeans and oats) followed by rye.</p>   | <p>For woven ground cloth, if the preceding crop was garlic, then there was no preceding cover crop. Cabbage sometimes follows a winter-killed oat/pea mix.<br/>For clover, the clover itself is the preceding cover crop.</p>         | <p>Spring brassicas usually go into pre-made hilled beds that are prepared in September of the preceding season. These are ideally seeded to Oats and Crimson clover in early September. The clover is terminated with rototiller in early April and beds are planted. For fall brassicas we ideally have a rye/clover crop (either crimson or a mix of medium red and yellow blossom sweet) that is terminated (mowed and disced) in June/July. These cover crops would be disced in prior to a pass with chisel plow.</p> |

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| Soil Amendments | <p>We typically use a 4-3-2 chicken crumble from Cashton Farm Supply at a rate of 2000lb/acre. If we are going into a field that has really low organic matter based on soil tests, we will typically apply compost from Purple Cow Organics at around 8 yards per acre. If we spread compost on the field we usually don't add any chicken crumbles. We make adjustments on potassium if soil tests suggest the need. We use Midwest Labs recommendations</p> | <p>In woven ground cloth: 2 yards compost &amp; lime (5:1 ratio) per 400'x5' row. The no-till beds hang on to nutrients. Now we have a basic soil (unheard of in our area) and 9% SOM. So no more regular compost applications.</p> <p>Our biology-based system is slow to start in our cold springs and a little artificial boost helps with early crops. Last spring, we added Chilean nitrate/feathermeal 6-0-6 fertilizer right before transplanting (3# N/row = 60#/acre). I hear Chilean nitrate is environmentally pretty evil, so I'd like to find an alternative for the spring boost.</p> <p>In clover, we are still working out the N dynamics and add organic N at half the rate recommended by soil tests. In previous years, I haven't seen a yield boost from rows that received additional fish fertilizer through drip versus those that didn't. In 2022, maybe because of the drought, there was significant yield response where cabbage that received no fertilizer averaged 2.4# heads, and cabbage with 90# N/acre averaged 3.8# heads.</p> <p>In clover, we add lime according to soil tests and will likely begin addin sulfur as we understand it is important for clover persistence.</p> | <p>CPM (composted poultry manure) at 1 ton / acre, Gypsum at 500lbs / acre and Potash at 200 lbs/acre ideally onto actively growing spring cover crop. Usually add 50/50 mix of CPM and 12-0-0 at a rate of 500 lbs/acre prior to first cultivation. In the spring we cut the 12-0-0 50/50 with Chilean Nitrate.</p> |
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| Soil Prep   | <p>Spring planting: winter killed cover crop residue is disked twice starting two weeks prior to planting. We apply either crumbles or compost and then till using a rototiller. We have started using plastic mulch for spring plantings and will typically put that down 2 days prior to transplanting.</p> <p>Fall planting: we terminate the rye by mowing and then taking 2-3 disking passes starting about 2 weeks prior to transplant date. Then we apply chicken crumbles and till beds 1-2 days prior to transplanting. We do our fall block on bare ground.</p> | <p>Permanent no-till beds are arranged 5' on center and in pairs. Each pair is separated by 15-20' of permanent pasture. Two sheets of 6' wide ground cloth are permanently pinned in the path between the two beds with 8" ground staples. One sheet is solid, one has a double row of holes burned every 18". Sheets are weighted on the outside edges with sandbags. This arrangement allows many options: We can grow directly in the holes in the ground cloth; or roll the cloth into the pathway and grow (a crop or cover crop) in bare soil; or mulch the bed with hay mown from the pasture area; or cover a bed with the solid sheet to terminate weeds.</p> <p>Prepping for cabbage involves flipping the sheet of ground cloth with holes onto the chosen bed. Depending on the preceding crop, we may spread some manure/lime before flipping.</p> <p>For cabbage in permanent clover, we just mow the clover with a drum mower the same day before transplanting.</p> | <p>Since cabbage is sprayed regularly and irrigated with water reel we prep the field in blocks of seven beds with an empty bed between blocks. This spacing works with the diameter of water reel, boom sprayer, and harvest conveyor.</p> <p>Spring: planting into premade beds we rototill and run the shaper pan over beds to press/shape them</p> <p>Fall: disc cover crop, chisel, disc, disc bedder to hill beds, then either shaper pan and plant or rototill, shaper pan and plant</p> |
| Bed Shaping | None  | <p>We shape the beds as needed. The tractor wheels themselves do most of the work, though we have also used a ripper with furrowing wings (from Buckeye). We remove the outer wing, so soil is just being thrown onto the bed, not onto pasture.</p> <p>In clover, crops are grown on the flat.</p>  | <p>We shape with a buckeye bed shaper. Since cabbage is mechanically cultivated a flat bed is needed for consistent cultivation. Final bed top is ~50 inches wide and we generally have 3-4" tall beds.</p>   |
| Mulching    | <p>We lay 4' wide black plastic mulch using a mulch layer from Nolts for our spring planting. We put mulch down to help warm the soil and keep the early weed pressure down. The plastic mulch also helps us keep moisture locked into our sandy soils, moisture that would be lost through continual cultivation.</p>  | <p>The ground cloth has a bunch of names, including woven ground cloth, woven cover, greenhouse fabric, etc. It is more heavy duty than weed mat and allows for moisture and air exchange. It has held up for us, in some cases, for over a decade. It has stripes every foot to help with spacing. We get ours from Nolts Produce Supply in PA. These sheets are permanently pinned on one side of each bed, so they are never rolled up and brought to storage. They just flip from one bed to another.</p>  | none  |

## Steadfast Acres

## Sawyer Farm

## Mile Creek Farm

## Planting

| Bed Width                   | Our beds are on 60" centers, with a 40" bed top  | Beds are 5' on center, with a ~36" bed top.   | 72" beds with ~50" beds tops   |
|-----------------------------|--|---|--|
| Plant Spacing               | <p>Spring plantings on plastic mulch see a little variation.</p> <p>Green Presto is 2 row 12" spacing staggered at 20" between rows for smaller more uniform heads.</p> <p>Famosa and Tendersweet are 2 row 18" spacing at 20" between rows, staggered. We like these to get a little larger for wholesale and market</p> <p>Fall planting is on bare ground and all at 2 row 18" spacing 26" between rows. We see more disease pressure on these plantings, so we like to give them a little more room for airflow.</p> | <p>Ground cloth: We've had to standardize hole spacing to compromise for a variety of crops. We have two rows at 24" apart. The holes are every 18" in row. It basically works for cabbage. If we had sheets for cabbage, we would probably add a third row or squeeze hole spacing down to 12".</p> <p>Clover: Also two rows ~24" apart per bed. Within the row, we often vary plant spacing. 18" spacings give us smaller heads that are good for the retail market, or for supermarket sales, whereas 24" spacings give us larger heads for restaurant and other wholesale sales, where big heads are desirable.</p>   | <p>We do cabbage at two rows per bed 36" apart with plants spaced at 12" in row.</p>   |
| Transplanting Process       | <p>We use a waterwheel transplanter with two riders (if we have the labor or one rider planting out both lines like a boss) in both mulch and bare ground plantings. The riders place the plugs with a little press into the wet hole then move surrounding soil over to cover the top of the plug to avoid transplants drying out.</p>  | <p>Ground cloth: We pull a single line of drip down the center of the bed, then flip the woven cloth onto the bed. If conditions are dry, we run the drip until the bed has adequate moisture. Then we transplant by hand.</p> <p>Permanent clover: We mow the clover short (~1.5") with a drum mower. We use a 33-6000 Mechanical Transplanter unit that is offset by 10" off center so that we can no-till transplant one row, turn around, follow the same set of wheel tracks, and plant the second row in that same bed. I would like to have a two row unit, but this works for the moment. We have a homemade coulter and disc running ahead of the planting shoe (I do not recommend Mechanical Transplanter's no-till attachment), and 250 pounds of additional weight on the packing wheels to get good furrow closure in the clover sod. After transplanting, we pull out a line of drip on each row of cabbage.</p> | <p>We have mostly used a mechanical transplanter 22C (finger transplanter, tobacco planter, etc.). We did purchase a mechanical transplanter model 4000 (carousel style planter) this past season and used it for spring cabbage, but not for fall cabbage. Generally the 22C is more adaptable to various field conditions, but requires a little more attention from operator to ensure consistent results. The Model 4000 takes longer to dial in, but allows us to plant faster with somewhat more consistency. We also don't have a water tank on the 22C, but we do on the Model 4000.</p> |
| Amendments at Transplanting | N/A  | <p>Prior to transplanting into the woven ground cover, we amend with compost or quick-release OG fertilizer if necessary.</p>   | none   |

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| Water at Transplanting | We apply water through the waterwheel at variable rates. Our goal is to have half the hole filled with water as the transplanter sets the plug                        | Ground Cloth: the bed is wet prior to transplanting by running drip. We run drip after transplanting as needed.<br>Permeant Clover: drip is run immediately after transplanting.  | We use a popper to loosen the cells of the 231. Heavy watering of transplants helps this process and provides enough moisture that we can run the 22C transplanter without any water in our soil and just water transplants with water reel.<br>When planting with the Model 4000 water we would apply water to the planting furrow. |
| Mulch at Transplanting |   | Ground Cloth: If we notice weeds germinating in the holes around the transplants, we use a handful of compost or woodchips to cover them.   | none   |
| Row Cover              | We cover transplants with Ag19 rowcover with no hoops, rolled out by hand, and secured every three steps with fabric anchors. (Dewitt brand red plastic anchors/pins) | We grew cabbage on bare soil for a decade, and covering was a must for flea beetles. In our new no-till systems, we haven't used cover on brassicas for the last two years now. I'm not ready to say we've got the problem licked, but it's very promising so far. My hypothesis is that a diversity of living plants provides habitat for flea beetle predators.<br>Ground Cloth: The woven ground cloth plantings are in these 'pastured' beds that are separated from one another by 15-20 feet of pasture. We leave the 15'-20' pasture unmown between the bed pairs until cabbage harvest. Flea beetle damage is small enough that it wouldn't justify row cover.<br>In the clover plantings, we are seeing zero flea beetle damage. | none   |

## Crop Maintenance

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| Irrigation | Spring crop we will drip irrigate for 2hrs two or three times a week depending on the rain.<br>Fall Crop gets overhead irrigation 2 times a week with a water reel 2 times a week if not raining | I should pay more attention to watering schedules. I have no idea. We gravity feed water from a creek, so we're fortunate not to worry about water use. On the other hand, we only have enough pressure to run 6-10 450' drip lines at a time (depending on flow in the creek), so if it's dry, we basically run as many lines at a time as we can for 12 hours, then turn on the next set of lines, etc. | We will run the water reel on cabbage to provide at least an inch of rain for each week when we don't receive rainfall. |
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| Changes to Irrigation | <p>Once a canopy is reached we back off of watering a bit. with spring crop on plastic we back off to twice a week and our fall crop with overhead once a week.</p> <p>Once heads have formed and they are getting closer to desired head size we stop watering all together, this could be a couple of weeks prior to harvest.</p>   |  | <p>We really try to provide a lot of water early in the crop's life. We will reduce water near harvest to avoid the chance of splitting if we happen to get an unexpectedly large amount of rain from a thunderstorm. Also we'll reduce watering as much as possible in the fall when the disease pressure from Alternaria and Black Rot is the greatest.</p>                                 |
| Insects Pests         | <p>Row cover takes care of flea beetles in the spring, along with the copious amounts of Asian greens we grow in proximity to our cabbage blocks.</p> <p>Fall crop sees cabbage loopers and, more increasingly, army worms. Scouting for army worms we can usually catch the first flush and remove the plant and cluster and destroy. For loopers, we will spray entrust one time per crop cycle. If problem is persistent we will apply a second spray about 20 days after initial spray.</p>   | <p>Cabbage worm is a problem. It's usually below a pain threshold economically, but their frass sits at the base of the leaves and so we have to be careful and often take off more leaves as we clean them up for sale.</p> <p>Slugs are an issue in both no-till systems. Again, there's rarely interior damage, but the cleaning process takes longer than for bare soil grown cabbage.</p> | <p>We regularly spray Bt. Occasionally if flea beetles are an issue on seedlings we will use Entrust too.</p>   |
| Diseases              | <p>We see alternaria, white leaf spot, and bacterial soft rot on our green cabbages. Our most disease prone cabbage is red cabbage. Typically we will see alternating layers of rot on the edges of the leaves.</p> <p>We are not exactly sure what that is, but it has historically resulted in excessive yield loss on otherwise nice size heads.</p> <p>We try to avoid walking through cabbage plantings when leaves are wet and we increase our plant spacing in the warmer temps when the fungal diseases are more prevalent. We don't spray anything to prevent.</p> |  | <p>We use Serenade/Regalia regularly and occasionally will use Copper if disease pressure/weather is really bad. Ideally we use the biologicals to prevent or slow down the onset of alternaria and black rot. Ultimately we don't really have disease issues when the weather is drier, but diseases can become a problem during periods of wet weather and warm overnight temperatures.</p> |

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| Weed Control | <p>Spring cabbage is in plastic mulch and that sees one pass through hand-weeding the holes about three weeks after transplant and track erasing about every 10 days.</p> <p>Fall cabbage we cultivate with a two row danish/S tine with wide sweeps both directions down the bed starting 2 weeks after transplant when row cover is removed then every 10 days or so until just before canopy is reached. After that, one more pass hand weeding if necessary and track erasing as needed.</p> | <p>Ground Cloth: After a couple years in no-till, there are very few weeds in the holes. Any germinating annual weeds are covered with generous handful of compost or woodchips around the transplant. We tolerate perennial weeds once crops are well established. They are killed with solid sheet of ground cloth after harvest. The goal is to never hand weed. Practically, we often do it once, or sporadically as we harvest, but it's very minimal.</p> <p>Clover: We mow with a lawnmower, 1-5 times per season, depending on weed pressure. We may also weed whack between plants, in row, if necessary. This year, we had to hand pull some big weeds in row. In row weeds are a result of the transplanter making too wide a furrow (4-8"), which opens up bare soil for weeds to germinate. When we were using a bulb auger, there was much less pressure. We'll solve the transplanter problem eventually, but are still working on it. Overall, there are very few weeds in the clover plantings because the clover canopy eliminates 90+%.</p> | <p>Tractor cultivation. Usually baskets, followed by sweeps with fingers. We keep running these through the plants usually 1-2 times per week until the fingers start to damage the leaves too much. Then we'll run a parallelogram type cultivator through to clean up pathways and between rows on the bed.</p> |

## Harvest and Yields

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| Harvest Window | <p>We like to have our first planting of cabbage ready for first or second week of July to line up with our 4th week of our CSA. Typically harvest standard fresh eating green then tendersweet and finally savoy over a three to four week period.</p> <p>Our second planting gets harvested across the month of September. Typically try to get red cabbage out of the field ASAP because they seem to be most prone to disease if left in the field too long. (We have cooler space constraints so this can prove challenging)</p> <p>For late season fresh eating green cabbage, we try to harvest by the third week of October for our last share delivery for main season.</p> | <p>We're lucky to get Napa by mid-June. Caraflex is ready shortly thereafter. As they start to get too big (mid-July), we harvest them all and put them in the walk-in. The Napa lasts a few weeks, the Caraflex a month or more. If we're on top of it, a second succession of Napa will fill the late August/early September window, at which point storage cabbage is ready to harvest.</p> <p>We save the big storage cabbage harvest for as long as possible. When the forecast has many nights in the low 20s, or when there are a few consecutive nights in the teens, we bring them all in, usually in late October/early November. This year, because of deer pressure, we had to harvest them in late September/early October.</p> | <p>Spring: end of June through mid July<br/>Fall: late September through mid October</p> |
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| Harvesting | We use serrated sheep foot knife from Victorinox and cut the cabbage head at the stem point just above the last full open leaf. We harvest into black crates then transferred to pallet bin in cooler. If we are short on crates we will transfer into pallet bin in the field and transfer to bin in cooler at packshed. We harvest when the dew has lifted, so late morning or early afternoon. | For fresh sales, cabbages are harvested and cleaned in the field, put in perf bags, and driven to the walk-in. We avoid super hot temperatures, but otherwise are not picky about when cabbage gets harvested. For storage cabbage, we cut the stem right where it meets the leaves. Depending on the size of the planting, etc., our favorite method is to have one 'cutter', one 'thrower', and one 'catcher.' The cutter severs the head, and the thrower tosses it to the catcher, who's standing on a trailer. Then we bring the trailer down to the barnyard, inspect for slug damage/frass and remove extra leaves if necessary. The heads go into feed sacks, and get stacked in cold storage. If they were harvested on a warm day and the nighttime temp will be above freezing, we'll let them lose heat outside before bringing them in. | Harvest as early in the morning as possible with knives. Generally we try to cut so that we don't have to clean any additional leaves post cut. We place cabbage upside down on top of plant that it was just cut from to keep from placing in mud when field is wet. Generally for CSA/market we'll gather 6-8 into each bin and carry bins to end of field by hand. For bulk harvest we'll cut and place on conveyor and place into bulk bin on trailer. In previous years we would sell 500-1000 lbs of boxing cabbage (~3 lb) heads to grocery stores. As a crop that could be harvested and packed with almost no washing/post harvest handling other than packing the proper number per box cabbage has the potential as a very desirable wholesale crop. The profitability though would go down as we moved into the storage crop and we had to spend more time cleaning. |
| Cleaning   | We don't wash our cabbage. We remove dirty leaf and trim stems accordingly.   | We slice off the base so that wrapper leaves come off easily, and keep removing the base ~1/2 at a time if more leaves need to come off.   | We don't usually do any washing of cabbage. If bulk harvested and stored for longer than a week or two we'll clean/prep cabbage ahead of time for CSA/market.  |
| Packing    | We load heads into a pallet bin without a plastic liner, then loosely cover the bin with plastic liner at the end of day, once cabbage has been cooled.   | We put harvested heads into feed sacks as we harvest, and then put the bags into bulk bins in temp-controlled storage. We pull the bags as needed and clean for wholesale/retail. Napa and Caraflex are sold in perf bags. Green and red storage are sold in wax bushel boxes.   | We just place bins from field directly in cooler. We will line bulk bins with plastic liner prior to filling them.   |
| Storage    | We store our cabbage at 38 degrees in our 10x10 cooler we like to keep humidity low to prevent potential disease spread in the bin. We don't add moisture to our cooler and have never measured humidity but the fans are always going.   | Long storage cabbage is kept at 34 degrees with high humidity. The feed sacks are breathable, but tend to trap moisture and create a damp micro-environment.   | We store cabbage in an insulated trailer cooled with CoolBot. This set up keeps temps in the low 40s. We try to place cabbage in the coolest part of trailer (farther from door) in order to keep it as cold as possible. Ultimately we don't have ideal long-term storage situation for cabbage, but this works for CSA/market.   |

|                      | Steadfast Acres  | Sawyer Farm  | Mile Creek Farm   |
|----------------------|--|--|---|
| Maximum Storage Time | We like to have all of our spring planted cabbage out of storage by the time our fall stuff is ready. we don't exceed 50 days typically. Our fall harvest hopefully holds until late December.                           | 7 months. The Napa lasts a few weeks, the Caraflex a month or more. Storage #4 lasts through the following June. Red storage doesn't last as long -- it starts to lose flavor a month or two earlier.  | In the fall, when we are able to keep trailer cooler we'll store cabbage for 2-3 months, though cleaning time increases with storage length. Also this only really works for larger, 4-5 pound heads. |
| Yields               | <p>Green Presto = 3# per bed foot (Fast Vantage is similar to Green Presto)</p> <p>Tendersweet = 3.5# per bed foot</p> <p>Famosa= 3.8# per bed foot, 2 separate plantings</p> <p>Passat = 1 pallet bin /100 bed feet</p> | <p>I should really keep better track. I will take a stab at an answer for fresh eating cabbage. Napa and Caraflex probably have 2# heads, on average. We generally lose some heads, and we usually overplant and don't bother harvesting some percentage. Also, early harvested heads weigh half as much as later harvested heads. Let's say 1.25 pounds per linear bed foot conservatively. We might wholesale it for as little as \$1.25/lb., or retail it for as much as \$2.50 per pound. You do the math.</p> <p>Clover: This year, fertilized at a rate of 90#/acre produced 3.8# heads on average, with 99% marketable = just under 30,000 marketable lb/acre</p> | We average around 6 lbs / bed foot. Generally it will be closer to 4 lbs in the spring and closer to 8 lbs in the fall.   |

## Equipment

|         |   |  |  |
|---------|---|--|--|
| General | <p>Waterwheel Transplanter paid \$1500, used</p> <p>Two row cultivator set up \$500, used</p> | <p>Ground Cloth equipment:</p> <p>Row cover (~\$100/6'x300' roll = \$133/bed).</p> <p>Manure spreader: varies so much!</p> <p>Hay mower and hay rake for cutting adjacent pasture and raking mulch onto beds (not necessary, but really nice!) \$5000 each</p> <p>Clover equipment:</p> <p>Hay mower (nice but not necessary; could use lawnmower): \$5000</p> <p>Lawn mower: \$50 - \$2000 (Low end is a used piece of junk, high end is self-propelled with a deep deck and good HP)</p> <p>Bulb auger (for smaller clover plantings): \$15</p> <p>Transplanter with no-till attachments/adaptations: \$7000 new, used...?</p> | There isn't really any specialty equipment used on cabbage that we don't use on other crops. |
|---------|---|--|--|

|                | Steadfast Acres   | Sawyer Farm  | Mile Creek Farm  |
|----------------|---|--|--|
| Biggest Impact | I'd say the transplanter is the most important part of our cabbage production because without it we would spend more labor time planting. And the cultivator saves time during weeding. | The transplanter is expensive, but it means that we can efficiently put thousands of transplants in per day. If we had a market for 40 tons of cabbage, we'd be all set! | Profitability of cabbage is most closely tied to the amount of cabbage that can be sold directly out of the field during the seasons/times of the year when it is easiest to grow. |

## Marketing

| Markets                  | Steadfast Acres   | Sawyer Farm  | Mile Creek Farm   |
|--------------------------|---|--|---|
| Markets                  | CSA, farmers market, direct to restaurant   | on-site farm stand, direct to grocery, wholesale through a distributor   | CSA, farmers market, Other CSA operations/farm markets  |
| CSA                      | We distribute cabbage 3 times in the spring and 2-3 times in the fall. We have switched to a customizable share and have discovered that if cabbage is not offered people don't typically swap for it. But if it is offered a fair number of members will swap it away... |  | We deliver around 8 weeks of cabbage throughout our 27 week season.<br>Occasionally we sell to other CSA farms for \$0.80 / lb. |
| Farmers Market           | Cabbage sells at market stand for \$2/pound   | \$2.50/pound. Cabbage >2# we wholesale or sell in the farm store for \$1.75-2/lb., depending on size.                                  | \$1.50 / pound  |
| Direct to Grocery        | \$1.10/pound  | It has varied so much over the past few years, with the pandemic, drought, and flood. Anywhere from \$1/lb. to \$2 per pound for Napa. | In previous years we would sell a 40# case for \$31   |
| Direct to Restaurant     | \$1.10/pound  |  |   |
| Wholesale to Distributor |   | It has varied so much over the past few years, with the pandemic, drought, and flood. Anywhere from \$1/lb. to \$2 per pound for Napa. | none  |