Potatoes

	Sandy Dietz Whitewater Gardens Farm	David Perkins Vermont Valley Community Farm LLC	Noah Engel Driftless Organics
Location	Altura, MN	Blue Mounds	Soldiers Grove
Acres in vegetables	14	30	60
Acres in Potatoes	1	11	10-15
How these tasks are done for Potatoes			
field prep/tillage	with a tractor	with a tractor	with a tractor
direct seeding	by hand	with a tractor	with a tractor
cultivating	with a 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 potatoes	do not do this task for potatoes
laying irrigation lines	by hand	do not do this task for potatoes	by hand
spraying for pests or diseases	with a tractor	with a tractor	with a tractor
harvesting	with a tractor	with a tractor	with a tractor
cleaning	by hand	by hand	by hand
bagging	do not do this task for potatoes	by hand	by hand
incorporating residues	with a tractor	with a tractor	with a tractor
farming style	certified organic	certified organic	certified organic

Varieties & Schedule

Seed Suppliers	We have used Moose Tubers the most but are phasing out purchasing from them because of some quality issues and substitution issues. We prefer to order Adirondack Blue and Red directly through Tuckers Taters out of New York. This past year we began ordering through Driftless Organics who can also purchase from Grand Teton Organics for us.	Always purchase seed certified by a Sate Seed Potato program. Your number one mistake is using diseased seed. Even with certified seed, the seed disease level varies. Ask the seed grower to learn more. We produce seed potatoes, and do recommend ourselves. We started growing seed partly because of the problems we encountered purchasing from other states. Our potatoes consistently exceed Certified Seed standards. We are part of the Wisconsin Seed Potato Program. Another seed grower we are familiar with is Wood Prairie out of Maine; they do an excellent job.	Gallenberg Farm-high quality seed, con-limited selection, not organic. Childs stock. Bula Farms Vermont Valley Farm Tuckers Taters Grand Teton Organics Rocky Farms

	Whitewater Gardens Farm	Vermont Valley Community Farm LLC	Driftless Organics
Varieties	Red Norland, Anushka, Adirondack Blue, Adirondack Red, Strawberry Paws, Carola, Red Gold, Salem, Yukon Nugget, Terra Rosa, Red Maria, Chiefton, Natasha, Augusta, King Edward. Our main crop potatoes that we do every year are Carola, Norland, Anushka, Ad Blue, Red Gold, Salem, Strawberry Paws, Red Maria, and Augusta. The others we do periodically or are just trying out for the first time. For blues, we still prefer the Adirondack Blues because they are usually reliable. Red Norlands we grow just for early new potatoes.	**See complete descriptions for each variety at the end of the handout.** Adorandak Blue Adorandak Red All Blue Austrian Cresent Carola Dark Red Norland French Fingerling German Butterball Goldrush Russet Kennebec Magic Molly Oneida Gold Peter Wilcox Red Endeaver Red Gold Superior W8405-1R Yukon Gold.	Satina-Yellow heavy yielder, nice skins, little to no hollow heart con-vines hold on after die back Mollie-Yellow heavy fruit set, uniform smaller potato, early, little to no hollow heart. con-seems more susceptible to disease and pests Carola-Yellow, consistent production, nice skins. con-somewhat uneven shapes Yukon Gold-Decent yield, nice skins, scabby at times, very hollow heart prone. We only plant this for early digging. German Butter Ball-Yellow, heavy yielder, drought and hollow heart resistant. con- netted skin, or in consistent, very long day. Red Endeavor-Red, nice skins, heavy fruit set. Red Maria-Red, very red, holds color for months in storage. con-poor yield Dark Red Norland-Red, fair yield, ready early. con-does not hold it's color Purple Majesty-Blue, beautiful, good yields, no problems with this variety. Purple Viking-Blue skin, white flesh, these get very big, nice alternative to a russet for a baking potato. On occasion we will plant the following but don't have constant data on them: Peter Wilcox, superior, Kennebec, French fingerling, Russian banana, La Rott, Pontiac red, Red Gold, Rose Finn Apple fingerling, Russet Norkota, Goldrush russet, Bintji yellow, and many others.

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Keeping Seed Fresh	We usually receive our seed potatoes mid to late march and try to plant them as soon as we can in April. We have found that in our soils and area that even a mid May planting can sometimes really affect and reduce our yield. We have cold storage that we can either keep at 40 degrees for long term storage or higher for shorter term.	You want seed potatoes to "warm up" prior to planting. This promotes quicker growth and less chance for rotting is cold soil. Our seed is kelp at long-term storage temperature (38 degrees) until they are bagged and delivered. They should be exposed to warmer air. If your seed arrives already heavily sprouted, you can still plant it, but do it soon.	Cold storage. Seed arrives in march and April. We plant in late May. At some point we bring seed out of cold storage to warm up before planting, we like our seed just spiking with sprouts when we go to plant.
Uncut Seed		We want a 2 ounce seed piece. If the potato is very small, it is 2 ounces, then it is not cut.	Our cutter sizes smaller ones out automatically, so those are not cut.
Cut Seed	We cut about half of our seed potatoes and try to do it about a week before planting. When we cut we usually try to have large pieces with at least 2 and preferably 3 eyes on each piece.	We cut all our seed to 2 ounce size. Fingerling varieties can be cut smaller. We hand cut. The cut pieces are allowed to heal over and warm up. We do not use any seed treatment. The cut pieces are placed in vented harvest containers. To generalize, larger seed pieces will produce more/smaller potatoes and smaller pieces with produce fewer/larger potatoes.	Increase number of seed pieces. Automatic seed cutter, makes blind cut and is older machine with limited adjustments. In general we want 2-4 once seed piece, with at least 1 sprout on it. We like to cure them for a week but weather dictates. We use a MYCO seed treat from Agri-Energies Resources it helps with Rhizoctonia and really seems to work well.
"Chitting" or "Greensprouting"	We chit our seed potatoes in a 65 degree area with light but not direct sunlight. We'll just leave them in the original bags until we cut them and sort them into crates to heal for several days before planting.		Experience is limited. Have done it a couple of times to get an earlier crop. Works well. Time consuming. We filled black bulb trays 4" deep and stacked them on a pallet for 3 weeks in 55 degree building. Not super light but had a few windows.
Planting Schedule	We plant all of our potatoes at once in the spring as soon as the weather is warm enough and the ground dry enough to till.	We plant all varieties at the end of April to the beginning of May. We adjust slightly by the spring temperature/soil temperature. Do not plant into cold wet soil, the potato will rot.	We plant 2 early varieties as soon as we can get in the field usually mid to late April, this is usually about 2 acres. We then plant the remaining acreage in late may into early June. Sometimes followed by a really late third planting in late June or early July.

Field Prep

Preceding Cash Crop	We try to grow our potatoes after a year of cover crop if at all possible.	We prefer to plant into a legume cover crop, usually alfalfa. Potato rotation is mostly potato/winter rye/ alfalfa and back to potato. Sometimes it is potato/other vegetable/other vegetable/alfalfa and then back to potato.	Our rotation is as follows: Cover crops-Potatoes-Parsnip/carrot/beet

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Preceding Cover Crop	Oats and field peas planted in fall and allowed to winter kill.	We usually grow alfalfa prior to potato to produce all the N needs of the potato and improve the soil structure for this "root" crop.	Oats peas, mustard (as a bio fumigant), vetch
Soil Amendments		We use a soil test to determine added fertility. Potato has an extremely high need for fertility; by far the most of an other vegetable. As needed, we use Tennessee brown rock phosphate, potassium sulfate, soybean meal and elemental sulfur. The rates depend on the soil. In sandy soil we do split applications of the potassium sulfate to prevent leaching.	Usually some type of calcium product 500 lbs to the acre. and a micro blend that has been tailored to the field based on soil tests, usually containing boron, magnesium,
Bed Prep	Usually we till with a rotovator before planting and hill with a four row Buffalo cultivator. For 2016 we attempted to experiment with blowing a thin layer of chopped straw mulch onto the soil and lightly working it in before hilling.	We use a rototiller usually once if taking down a cover crop. In fall chisel plowed soil, once with the Perfecta is good enough. The ground can be very rough for the potato planter. The planter essentially does a tillage because of its hilling action.	Chisel plow or subsoil, then field cultivate 1-3 times a week apart before planting. We want a nice loose soil. depends somewhat on conditions, if trashy we might disc or rotovate once also.
Mulching & Hilling Before Planting	We blew on chopped straw mulch with a landscape mulcher to be lightly tilled in before hilling. We were hoping that having more residue in the soil would help keep the hills from cracking and greening the potatoes. We are on very heavy clay, so planting on flat ground would make harvesting a nightmare. After we till we prepare approx. 12 inch high ridges with a four row buffalo cultivator. After planting we use the same cultivator to cultivate and hill rows.		
Notes on Field Prep	Along with blowing on the mulch before planting, the plan was to blow on mulch before each of two hillings. This would lightly incorporate the straw into the soil. Having the mulch chopped allows us to cultivate and hill without dragging mulch through the planting. We were not able to follow through because of the wet 2016.	If taking down a cover crop, enough time should be allowed for partial decomposition of the residue for reasons of scab prevention; scab likes residue. This may mean a second tilling before planting if the first was insufficient for incorporating the cover crop.	

Seeding

	Whitewater Gardens Farm	Vermont Valley Community Farm LLC	Driftless Organics
Optimal Soil Temp	We don't usually check soil temp.	A minimum soil temperature of 55 to 60 degrees is called for. Generally, soil temperature is not a problem by early May in our area and soils.	Have never monitored this. Warm.
Optimal Soil Moisture	I don't usually test, but dry enough that we don't damage soil structure any more than we have to.	At planting, not too wet to cause soil structure damage. After planting, some moisture is provided both for the potatoes and to encourage weed growth.	I like some moisture, but not so much that we are causing damage to soil structure.
Bed Width	We use a hilled row system where the hills are approx. 12" high and 14" wide at the base. Row spacing is 32 inches.	We use 30 inch row spacing. This is on the narrow end for potato hills, but it is consistent with everything else we grow.	1 row every 36"
Spacing	12" between plants	Spacing depends on the goal for the variety. Wider spacing means larger/fewer tubers. We plant most varieties at 12 inch spacing, but some varieties are at narrower spacing to prevent excessive tuber sizes or because of yield response. Yukon is planted at 6 inch spacing for the best yield, and to lessen hollow heart with large tubers. Kennebec, Adirondak Blue, Goldrush Russet, W8405-1R and Dark Red Norland are planted at 8 inches to reduce tuber size. Because we are primarily producing seed potatoes, our goal is not to have large potatoes. Moderate size seed potatoes make for better seed pieces.	6"-10" between plants. Varies on variety and condition of seed in some cases.
Planting Process	We plant using antique potato planters, one person on the planter and a second person carrying a pail and dropping potatoes into the planter. These are planted directly into the ridges. They will be hilled again immediately after planting.	We use a potato planter. We can adjust plant spacing as desired. The planter leaves a hill over the planted seed pieces.	We use a 4 row cup style planter.
Fertility at Planting	We will usually dust the seed potatoes with a microbial inoculant right before planting.		Planter has fert boxes that dribbles 500-700 pounds to the acre of starter. Ida Gro compost, in row

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Water at Planting			If it is really dry and we have the capacity we will irrigate just enough to keep ground moist.
Preventing Seed Rot	Being planted into the ridges usually provides good drainage to prevent rotting.	Do not plant in cold, wet soils. The potato will rot. Potatoes are sensitive to excessive soil moisture. Mature potatoes prior to harvest that are inundated with soil moisture will rot.	Choose ideal soil conditions. Dry, warm. Good seed.
Notes on Planting			Don't forget a clip board and pen and paper for a map.

Crop Maintenance

Hilling After Emergence	When the plants have emerged we hill with the same Buffalo cultivator that we used to build the ridges. We try to do this at least two times before plants canopy too much to go through the rows without damage.	Hilling is part of our weed control strategy: 1. the potato planter hills over the seed; 2. just as we start to see some plants emerge we use a tine weeder to knock down the hill and kill all the weeds; 3. once all the plants are about 6 to 12 inches tall we aggressively hill; prior to row fill we hill the second and last time.	We try to hill twice, weather does not always allow for this. first hilling when plants are around 12". Second hilling is just before plants fall into the rows.
Mulch	Usually we do not mulch, but the plan for this next season is to blow a thin layer of mulch onto the potatoes right before hilling. Going through to hill with the cultivator should then lightly incorporate the mulch into the soil on the hills. After the final hilling we will blow mulch onto the potatoes for the last time and leave it in place. The chopped straw mulch is blown onto the potatoes using a landscape mulcher. Using a light layer of chopped mulch should allow us to cultivate out any weeds if needed with the tractor without pulling all the mulch out of the rows. The mulch will ultimately not be used to prevent weeds but to aid drainage since we have extremely heavy clay and to hopefully prevent cracking the ridges that allow light to hit the potatoes and turn them green.		

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Irrigation	We only irrigate if it is extremely dry and then either with drip irrigation if there is not too much canopy to apply it, or if there is too much canopy, with small movable overhead waterers.	We use a center pivot and traveling guns. You want to maintain and even moisture level and preferably near full soil holding capacity. This is a tricky part of potato growing. Do not over irrigate to cause extreme fluctuation in soil moisture. However, the sky does not always cooperate. You can ruin your crop yourself with bad water management; it is too easy to do. Uneven moisture can promote hollow heart and scab. Depending on rains, we irrigate twice a week at about a half inch, depending on conditions. Generally, irrigate at smaller quantities more often. Potatoes definitely respond to optimum moisture. It can be the difference between a great harvest and a poor one.	Most of our potato production is non irrigated. Other wise an 1" per week would be ideal and more during bulking.
Irrigation Modifications	Once the crop reaches maturity we will not worry about irrigation anymore.	When the potatoes begin to bulk, they need the most moisture and are most sensitive to moisture fluctuations. However, they need water from the beginning. You will get potatoes even if you ignore water, but if you do a good job with water, you will get a lot more potato.	More during bulking. Also, it is nice to have fairly dry conditions for harvest but we would irrigate at harvest too if it was really dry. Potatoes suffer from bruising if harvested too dry.
Supplemental Fertility			We usually add nitrogen(20-50 pounds to the acre) and potash(200 ish pounds to the acre) at same time as hilling. This is also done per soil tests. (required if you are organic)
Weeding	Most of our weeding is done using either a regular field cultivator or the Buffalo cultivator. As described above, the mulch that we use is not to prevent weeds since it will be applied too thinly. In row weeds are hand weeded out as necessary. We try to plant after a cover crop to lessen weed pressure.	Hilling is key. See above. We have done some hand weeding when our hill/weed system fails (rarely). Failure occurs if we did not do timely hilling. When the potato plants begin to die off, we get a late flush of weeds. They have no impact on crop growth, since growing is done, but they do affect harvester. Sometimes when they are particularly bad, we will use the hiller to smoother them, knowing we are doing some damage to the crop also.	First thing after planting we tine weed several times, this is a 4 row, 3 point tool. Then finger weed once, 2 row mounted on a super C tractor. Shovels on cultivating tractor one time. Then hill.

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Insects	Potato beetles are our biggest pest and if there are too many to hand pick, which is usually the case, we can usually get by with one application of Entrust.	Colorado potato beetle walks in every year eventually. Entrust SC applied once or sometimes twice does the job. Bt works well, but is no longer available in an approved product. We wait for emergence of the first flush of eggs. Leafhoppers can be a significant problem. Some varieties are more susceptible than others. They are difficult to control, and usually cause us yield loss. Pyganic can slow them down, but they are relentless in a bad year.	Colorado Potato beetle, leaf hoppers, flea beetles. We plant late to avoid most of these issues.
Rodents	We have very little damage from rodents and if we do it's usually Pocket Gophers which we try to take care of with traps.	Not a problem.	We do nothing about rodents. What can you do?
Diseases	Our worst disease problems are rhizoctonia and scab. We try to deal with these using rotation and microbial inoculants.	Late blight, if in WI requires action. It can wipe out your crop and cause problems for other farmers. Copper (Champ WG) is an effective preventative material as well as EF440/Backstop. Early blight affects potatoes every year and in combination with leafhoppers can be devastating. Copper is effective against early blight. Monitor your crop for the diseases and read the WI Pest Bulletin to get a heads up on what is happening in the state.	Early and Late Blight. We use copper as a preventive. It needs to be applied before you have a problem.
Potato Scab & Hollow Heart	For hollow heart we try to provide the best drainage possible but ultimately using varieties resistant to both scab and hollow heart works best for us.	Water management is key (see above.) Rapid growth causes hollow heart. Susceptibility varies with variety. The soil pH significantly affects scab. Scab can be mostly prevented for scab susceptible varieties with 5.0 to 5.6 pH on mineral soils. For scab resistant varieties, a 6.0 pH will do. However, if you are growing other vegetables, you do not want the very low pH levels. Variety selection is an important decision. Since we grow for seed, we are lowering our pH on ground primarily used for seed potatoes to reduce scab on all varieties. You may not want to do that.	Soil amending. Well drained soil, variety selection.

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Crop Maintenance Notes		Things can change very fast with potatoes. Both disease and insects can change your harvest dramatically in a week. Very frequent monitoring is very important. We learn more every year and we have the advantage of working closely with the WI potato experts in in the seed program. It is a challenging crop to do well.	

Harvest and Yields

Harvest Window	We begin harvesting new potatoes as early as we can in July and continue through the season as needed. Ultimately we prefer to have our main crops of storage potatoes out of the ground late August/early September. The later our potatoes stay in the ground the more rhizoctonia and scab we get. That said, we sell most of our potatoes through the summer months, so we don't usually have many to harvest for storage in the fall.	We do a hand harvest of immature potatoes for CSA delivery in later July. Our CSA also gets an early June delivery from potatoes we have held from the prior year. After that, we wait until late August to early September to harvest all the varieties.	Harvest of new potatoes begins in July and continues through the season as needed. Storage potatoes are harvested when skins are sufficiently hardened off. Usually mid to late October.
Harvest Procedure	Early potatoes are dug by hand with a fork, but as soon as we can we begin to dig using the tractor and either a middle buster (a one bottom plow), or a Checchi & Magli potato digger. The middle buster lays open a trench pushing the potatoes off to the side, the Checchi & Magli lift the potatoes out of the ground and drops them back on top of the ground. With either one, we then have one to four people grubbing out the potatoes and putting them into harvest crates. If we are digging our storage potatoes we will then dump the potatoes into large storage bins.	The potatoes need to stop growth and be allowed to set their skins prior to harvest, a period of 2 to 3 weeks. Early varieties will have died off on their own. Later varieties may still be growing and we flail there tops to kill them and give them time to cure. We flail all the rows to eliminate late season weeds to facilitate harvest. We plant in the order they will mature. We have a two European style harvester that discharges into a potato wagon. We unload the potatoes into bulk bins and take them to our potato storage cooler. We clean out the machines between each variety to maintain variety purity, since we are growing primarily for seed. For the two early CSA deliveries, we undercut the potatoes with a Rainflow mulch lifter and hand pick the potatoes into hand totes.	New ones are dug with 2 row pto digger, after vines are mowed off. Digger gently separates spuds form soil. People go behind and put into bushel crates. Crates are stacked on pallets and taken to pack shed. A few are weighed to determine an average weight and total weight is recorded in harvest log. Product is unloaded with forklift and wheeled to "unwashed" section of cooler. Mature crop is mainly harvested with harvester which unloads product into 20 bushel bulk bins. 4 bins per wagon, unloaded with forklift. Recorded in harvest log.

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Curing	Because we sell most of our potatoes fresh out of the ground we don't have to worry about curing too much. Usually by the time our storage potatoes come out they have quite heavy skins so unless they are harvested from wet ground we don't cure much.	All our potatoes go into a separate potato cooler. All potatoes are in bulk bins holding about 1,000lbs. The temperature is maintained initially at 55 degrees for several weeks. The temperature is then very gradually reduce to 38 degrees for long-term seed storage. A humidifier is in the cooler to maintain a goal of 95% humidity. Conditions are maintained all winter until we remove the potatoes for bagging.	We start selling early varieties as soon as they come out of the field. The potato cooler is set around 55 degrees during harvest and then turned down a few degrees a week until we reach about 38. Humidity is important, we have an industrial humidifier, still working on perfecting this process. Good air circulation is important, as are full air exchanges (meaning bringing outside air in) to prevent build up of carbon dioxide. There are a lot of variables and tons of good reading on this subject.
Cleaning	A pressure hose is used to clean the potato diggers after use and any forks used are also hosed off.	We cull all potatoes several times. The first time is on the harvester. There is room for 4 people to cull as we go. If we have any concerns, we will do our first cull in late fall before long-term storage. We use a roller table to get a good look at every potato. In the spring, as part of the bagging process, we use the roller table again to look at every potato. This is lots of fun for the whole crew in March and April. For potatoes we deliver to our CSA, we wash them in a barrel washer combined with a brush washer and culling station.	Bins are removed from cold storage and placed on bin dumper which aids in removing the potatoes from the bins, they are then elevated into a brush type washer with water, once out of washer they roll onto an inspection table. Lot number and variety must be recorded in "logs" book as well as cooler inventory sheet updated for each bin processed.
Packing	Most of our potatoes are sold at farmers market. Early new potatoes are sold by the pint in pressed paper pint containers. Main season potatoes are sold bulk by the pound out of harvest crates or baskets. If the potatoes are sold wholesale, they are boxed in waxed vegetable boxes with the bottom and top lined with craft paper. Boxes are usually 1 1/9 size boxes holding 40 lbs of potatoes. Occasionally we will sell 5 lb net bags of storage potatoes at farmers market. All potatoes are sold washed using a brush washer.	All our storage is in bulk bins. Most of our seed potatoes are bagged into 50lb bags using a "Red Head" bagger which holds the bags combined with a digital platform scale to ensure accurate weights. Our smaller bags are bagged using a digital bagging table. The bagging table is also used for our CSA bags.	Once on inspection table they are all sorted for size and grade by hand. Mostly they go into clean bushel crates to be packed later. All product is moved around on pallets with pallet jack. Our main pack is 5 pound bags. So "bagger" potatoes would go into bushel crates (with corresponding lot tags for each) which are then stacked on pallets and set in "clean" section of cooler. When we receive an order for bagged potatoes this pallet is retrieved and wheeled to bagging station where they are bagged and yes, lots have to be added to each super. A super (sack) contains 10 count of 5 pound bags or 10-5.

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Storage	Potatoes are stored in large storage bins that can hold anywhere from 700 to 1000 lbs. These are placed in a cooler where the temperature is kept at approx. 45 degrees. We also keep the bins covered with several layers of sheets or heavy blankets to keep the light off the potatoes. At times the florescent lights in the cooler are left on for several hours and if not covered they will green the potatoes. We usually have potatoes until Christmas before we run out and quality tends to stay quite good until then.	Same answer as in question above with the added statement: potatoes can be held for extended periods if temperature and humidity are maintained. The potatoes we deliver to our CSA members in June from the prior year harvest are great eating, they tend to have sweetened from a starch to sugar conversion, and depend on variety, my have "softened" a little, so even though delicious and nutritious, probably not good for a market stand. Answer repeat: All our potatoes go into a separate potato cooler. All potatoes are in bulk bins holding about 1,000lbs. The temperature is maintained initially at 55 degrees for several weeks. The temperature is then very gradually reduce to 38 degrees for long-term seed storage. A humidifier is in the cooler to maintain a goal of 95% humidity. Conditions are maintained all winter until we remove the potatoes for bagging.	Potatoes are stored in 20 bushel bulk bins, dirty, in large walk in cooler. Usually 6-7 bins tall. Temp is set about 55 when product is coming in from field. It is turned down 3-4 degrees a week until we reach about 38 degrees. 6-7 Months is pretty common. we will replant our own potatoes in late may and it is often some of our nicest seed, with excellent vigor. Taste is not the best after this long of a storage period as starches have converted to sugars. Some people love flavor. We tell all of our customers in the spring that the potatoes were stored over winter and have sweetened up a bit and we sell thousands of pounds this way at market in the spring.
Yields		Potatoes yields vary greatly, variety to variety and year to year. For example, our Onieda Gold yield this year was 38,000lbs/acre (2.2lbs per row foot in 30 inch rows), as compared to a complete failure due to quality issues, such as excessive scab in a blue variety. Potatoes can do great, but are no sure thing, they are fussy.	about 2 pounds per row foot. Although it does vary by variety.
Notes about Harvest & Yields		There are issues if mechanically harvesting that do not exist if hand harvesting, like bruising and skinning. Hand harvest is a lot more work, but gives a lot more flexibility. We did hand harvest everything but moved to mechanical at about 6 acres.	Marketable yield is more important than total yield. We would much rather see 20,000 pounds to the acre at 100% pack out then 40,000 pounds to the acre and 50% pack out. Culling that 50% is labor intensive and moral breaking for staff. Takes up storage area time moving product around etc.

Equipment

	Whitewater Gardens Farm	Vermont Valley Community Farm LLC	Driftless Organics
Equipment	Buffalo cultivator: ours is on permanent loan from a neighbor, would cost anywhere from approx $2700 on up to $8000 or more Antique potato planters: we found ours for under $15 each Middle buster: $150 to $180 new Checchi & Magli: $3150.00 Landscape mulcher:	Potato planter new, $2,500 to $7,500 for 2 row. Two row hiller new about $2500. Tine weeder about $2,000. Sprayer about $5,000 new. Undercutter for hand harvest $2,500. My mechanical harvester new is about $100,000 (I got my used in a great deal for me). Potato wagon we use in only available used, they do not make them that small anymore, so a few hundred $ to buy plus lots of repairs; to modernize ours in added up to $2,500. Bulk bins at $135 each. Large barrel washer at $16,000, but smaller ones at $2,500. Brush washer system at $2,500. Our roller table is a stand alone, not sure if available new, but they exist used in the potato world, ours $450 used. Tractors we use in our potato operation $45,000 to $90,000 new. My rule of thumb on used equipment, is it if good condition, it is worth about half of the new price. If you scour the used market including auctions, you can get great deals on good used, but it takes diligence. Most of the potato specific equipment was purchased used.	Potato harvester:$22,000, used. Planter:$2500 used. Hiller:$2500 used. Tine weeder:$1100 used. Seed cutter:$700 used. Washer:$6000 used. Roller inspection table $550 used. Northwest single head bagger (for 0-10 pound bags)$2000 used. Fischbein sewer with L belt $600 used. Hand held bag sewer $500 new. Pallet jacks $500 new. Forklifts (invaluable) we have several all bought used for around $3000 to $6000. Humidifier for cooler $1700 new. 4 row side dresser $2000 used. Cone spreader $700 used. Several flat wagons to carry bins $7-800 each used. 20 bu bins $2 to $100 used. Bushel crates $10 each new. 2 row potato digger $4000 used. Flail mower $2500 used.
Equipment Priorities	Probably the Buffalo cultivator just because we use it for so many aspects of the potato crop, from building ridges, to hilling, to cultivating. The antique potato planters have also allowed us to plant quickly and easily into the ridge system that we use.	Potato is too complicated of a crop to single out one piece of equipment. Bare bones would be: something to put the seed in the ground, could be creative (waterwheel if you have one); you must hill the potatoes, so something to move soil to form the hill; something to knock the hill down for weed control; any kind of sprayer that gives good coverage; something to lift the potatoes, other than a fork saves the back. A wish I had pictures from 22 years ago, we did about everything wrong.	Weed control is always money well spent.

Marketing

	Whitewater Gardens Farm	Vermont Valley Community Farm LLC	Driftless Organics
Markets	farmers market, direct to grocery, direct to restaurant	CSA, Seed potatoes	CSA, farmers market, direct to grocery, direct to restaurant, wholesale through a distributor
CSA		10 deliveries over a 20 week period. 3 to 4 lb bags	10-15 pounds per share. at least 4 different times.
Farmers Market Prices	$1.50 to $1.75 lb depending on the time of year. We sell new potatoes for $3 to $3.50 pint		$2/lb
Direct to Grocery Prices	About $1 lb		varies, 0.60 to $1/lb
Direct to Restaurant Prices	About $1 lb		varies, 0.60 to $1/lb
Wholesale Prices to Distributor			varies, 0.60 to $1/lb
Other Outlets		We sell most of our potatoes as seed. See organicpotatoseed.com Sell 50, 25, 10 and 5 pound bags, 18 varieties. Price depends upon size and variety, but a 50lb bag of most varieties is $67.	
Seconds	We have had some schools show some interest in seconds but not much activity yet. Most of our seconds go to the food shelf.	We donate our second quality potatoes to Second Harvest. All "bad" potatoes are discarded.	Food bank. 6 cents per pound.

Vermont Valley Community Farm, LLC - Potato Variety Descriptions

Adorandak Blue. A dark blue skinned potato with dark blue flesh. Maintains its color after cooking. Potential very high yields with medium to large tubers. It is susceptible to bruising and soft rot. We have found it to be much more scab resistant than other blue potatoes.	Adorandak Red. A bright red skin and streaked to solid red flesh potato. Aggressive growth habit with moderate yields. Very good flavor but can become bitter. Somewhat susceptible to scab. Makes pretty fried potatoes
All Blue. A medium to small oblong potato with deep blue skin and a colorful blue flesh with white streaks. It is a good choice for baking or frying and is excellent for making colorful chips. It stores well. Well know variety with potential for high yields; however very susceptible to scab resulting in high cull rates. We are moving to other blues with less scab.	Austrian Cresent. A yellow skin, yellow flesh fingerling. Potential for high yields. Medium to large tubers for a fingerling.

Carola. A yellow flesh/yellow skin variety. Produces many medium sized attractive tubers. Great potato for baking or boiling. Excellent flavor.	Dark Red Norland. The organic growers choice for the early red. Excellent flavor. Red skin and white flesh. Produces both boiler and baker size spuds, a very versatile potato. Moderate to high yields, not the best long term storage, skin lightens and flesh can soften, although eating quality is maintained.
French Fingerling. Very attractive pink skin/yellow flesh variety. High yields of good sized fingerlings, even a few baker sized. Aggressive plant growth smothers weeds. Very resistant to leafhopper feeding. We like this variety for yield, taste and growth characteristics. Excellent flavor. Needs a good size hill to prevent tuber exposure/greening.	German Butterball. Light yellow skin/yellow flesh potato with a slightly russet skin. Excellent flavor. Medium size tubers, almost defect free. Moderate to high yields.
Goldrush Russet. A russet with flavor. Uniform size and shape. Attractive appearance with very few defects. Very good for baking or frying. A long day variety so may need extra care; capable of high yields if kelp alive; concern is later season leafhoppers.	Kennebec. A great baker sized potato. White flesh and skin. Capable of high yields and large spuds. Excellent flavor. Needs a good size hill to prevent tuber exposure/greening. Resilient plant, but susceptible to bruising. Greens quickly if exposed to light. Tubers can get too big. Good hand harvest variety.
Magic Molly. An Alaskan bred variety, with very dark blue to purple skin and purple flesh that retains its color even after boiling. It has a round to fingerling shape. Very pretty potato but also susceptible to scab. Smaller yields.	Oneida Gold. Our favorite yellow. A newer WI variety with bright yellow skin slightly netted and medium yellow flesh. It is similar in size and shape to Yukon Gold. Oneida Gold has superior tolerance to common scab and is not susceptible to hollow heart. It is a full season potato with very high yield potential.
Peter Wilcox A newer variety developed by the USDA breeding program. It has a medium purple skin color and a medium to dark yellow flesh. It was bred for nutritional qualities; the carotenoid content is 15% higher than Yukon Gold; and it has a high Vitamin C content. Very attractive, somewhat susceptible to scab, excellent flavor, average to smaller yields.	Red Endeaver. New variety from the Wisconsin breeding program. Red skin/white flesh potato. Similar in size and shape to Dark Red Norland, but more attractive. Stores well. Yielded similar to Dark Red Norland.
Red Gold. Attractive light red skinned potato, with yellow flesh. It is a very early season variety that is an excellent “new” potato. Plants produce many medium size potatoes with good yield potential. It is moderately resistant to common scab. It does not store well long term.	Superior. An very early maturing white skin/white flesh potato. We like its flavor, uniform size, and skin color. It is a medium size white potato that stores well, but unlike Kennebec will not easily “green” when exposed to light. Defect free tubers. It has a "week" plant structure meaning less competitive with weeds and other stresses; however we get good yields. This is an older Wisconsin bred variety.
W8405-1R A new variety from the Wisconsin breeding program. Oblong with red skin and white flesh. It has a smooth skin that we have found to be more resistant to skinning than any other red variety we have grown. Similar Red Endeaver in yield and storage.	Yukon Gold. Yellow flesh/yellow skin potato. Stores well. We plant at 6 inches for the highest yields and still get large tubers. Older variety with name recognition. Very susceptible to hollow heart and scab. Attractive if defects avoided. Onieda Gold is a better choice.