

Leeks



Extension
UNIVERSITY OF WISCONSIN-MADISON
DANE COUNTY



FAIRSHARE
CSA COALITION

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Raleigh's Hillside Farm

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PrairieErth Farm

Steve Pincus
Tipi Produce

Location	Brodhead, WI	Atlanta, IL	Evansville WI
Total acres in Vegetables	4	35	about 40
Total Acres in Leeks	0.06	0.25	0.2

How these tasks are done for Leeks:

field prep/tillage	with a tractor	with a tractor	with a tractor
creating stale seed beds	by hand	with a tractor	do not do this task for leeks
direct seeding	do not do this task for leeks	do not do this task for leeks	do not do this task for leeks
transplanting	by hand	with a tractor	with a tractor
cultivating	by hand	with a tractor	with a tractor
hilling	by hand	with a tractor	with a tractor
mulching	do not do this task for leeks	by hand	do not do this task for leeks
laying irrigation lines	by hand	by hand	do not do this task for leeks
laying row cover	do not do this task for leeks	by hand	do not do this task for leeks
spraying for pests, diseases, weeds	by hand	with a tractor	do not do this task for leeks
harvesting	by hand	by hand	with a tractor
Please indicate your farming style	certified organic	certified organic	certified organic

Propagation

Varieties	King Richard-short days to maturity is nice for succession plantings and less pressure to get into the ground as early as other varieties, always gets a nice long blanched stalk, sizes up well for earlier harvests. Takrima- Self-blanching, cold hardy, good yielding, produces a very nice looking leek	Rally, Megaton	Megaton, Lexton
Seeding Trays	341 plantel trays and 192 plantel trays	128's, one seed per cell seeded with a Carolina Greenhouse seeder	usually a deep 200 cell 10x20 tray; plant 2 seeds/cell



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Soil Mix	West Star Organics Growers Mix	CowsMo Potting Mix	We make our own; peat, vermiculite, perlite, compost, dried alfalfa meal, Sustaine, Rootshield, kelp, soy meal, lime, azomite, pasteurized soil
Propagation Schedule	Takrima- seeded March 2nd, transplanted May 29th King Richard- seeded March 2nd, transplanted 1st planting May 23rd, 2nd planting June 8th	2/5, 3/27, 4/9	2 plantings: 1st planting- seed mid-March, transplant early-mid May; 2nd planting- seed early-mid April, transplant early June
Germination	Keep trays in greenhouse, which is kept around 60-68 degrees during day and 55 at night, off heat mats cover with a sheet of row cover, using a mist nozzle when necessary to keep moist. I have had much better success when they get the cooler temps during the night.	Germ Chamber and radiant heat bench tops	4-5 days in germinator at 75F
Greenhouse Irrigation	Mist nozzle until germinated, then a Dramm lemon watering head. Once in the morning until cells are completely wet if its full sun, if cloudy I will spot water edges as needed but will try to wait for next sunnyish day. I have had better success when leaning on the dry side of when to water, I have seen root rot when kept too moist.	As needed by hand	as needed
Greenhouse Conditions	Temperature between 55 - 70 degrees, 50-70% humidity, full sun. All of our leeks are grouped together on the side of the greenhouse with our intake vent which gives them more circulation and cooler temps then the rest of the greenhouse.	We minimally heat our greenhouse during February. Once all are up by the third week of February we will move them to an unheated tunnel. If nights are cold we will pull rowcover over to protect. We will vent tunnels if temps get above 85 degrees and shut them back up once the sun starts to go down.	Leeks have to share a greenhouse with many other crops. They are very tolerant, will grow well under cool or warm conditions
Hardening Off	We move the flats to the cold frame, kept closer to 45-50 degrees at night, til around the end of April, then we move trays outside around middle of May(row cover if below 40 for first few days) and will remain outside til transplanted	We harden off at least 2 weeks before planting in the field. We set up benches on saw horses outside our greenhouses, days before transplanting they will get moved to a wagon.	We get trays of leeks onto outside racks as soon as we can. They will be fine with light frosts.
Greenhouse Pests of Diseases	Fortunately, none	None	No issues

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Bed Prep

Preceding Cash Crop	2017- Alfalfa 2018- Fall Lettuce	2019 A fall crop with good weed control like carrots or beets a spring cover crop 2018 Potatoes 2017 wheat and clover	no regular rotation
Preceding Cover Crop	2018-Buckwheat/Crimson clover, before fall lettuce	Most recent..Rojo Mustard	not a spring planted cover crop
Soil Amendments	Re-Vita Pro (5-4-5)- slow release of macro and micro nutrients -8-10#/100' bed Azomite- mineralize soil and micro nutrients and helps stimulate microbial life - 1#/bed Agri-lig Humates- humic acid to greatly boost microbial life and helps lower pH - 2#/bed Sea-Min Kelp - stimulates root growth and nutrient uptake - 1#/bed Soft Rock Phosphate- balance P deficiency - 3#/bed Sulfate of Potash - balance K deficiency - 1#/bed NutraSoft DG Gypsum- adds calcium and sulfur without raising pH, improves soil aeration - 3#/bed All amendments and rates are based off of recommendations from soil tests results	In average fertility 600 lb of chicken pellets to the acre	a good dose of dry chicken pellets (1.5 tons/acre)
Bed Prep	Spread amendments, till 2-3" to incorporate amendments, cover all beds with woven ground cover for minimum 3 weeks to achieve clean stale beds ready for transplanting.	For the first leeks of the season we will prep beds in the fall so they dry out early We form beds 3 to 4 weeks before later leeks are planted. Stale seed bedding with a prototype seedbed preparation tool from Sutton Ag	usually finish with a Perfecta field cultivator

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Stale bed, Occultation, or Tarping	Cover beds with 40' x 100' Ultraweb woven ground cover 3 weeks prior to transplant date, we use anchor bags every 5' on edges and about every 15' in the middle of the ground cover between beds. We remove ground cover 1-2 days before desired transplant date allowing the soil to dry enough to be able to plant efficiently using a hand dibbler.	Using our stale seedbedder we set the machine to 3/4" deep to shallowly disturb the soil without bringing any more weed seeds to the surface. We run this over beds after a rain to deplete the seed bank as much as possible before planting.	
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Planting

Bed Width	5'	53" bed top, 6' centers	6 ft
Plant Spacing	3 rows 12" apart, 5-6" between plants	3 15" rows 6.5" apart in row	2 rows 36" apart; 5-6" apart in row- some plugs have 2 plants
Transplanting Process	After we remove the ground cover, we measure the rows in each bed with flags, lay a string tied to stakes at each end and lay a measuring tape down the middle of bed, then use hand dibblers to make the holes, next transplant leeks deep in the holes and cover.	We use a 3 row Mechanical 5000	Three transplant methods. 1- use our Mechanical 5000 carousel transplanter, if plugs have good enough root balls. 2- Water wheel transplanter with spike wheels, if plugs are weak. 3- Leek dibbler makes spaced holes, we drop plugs or push bare-root plants into holes.
Fertility at Planting	DRAMM ONE- 1-2 OZ/Gal as a soil drench in the trays before transplanting	Before the final seedbed prep pass we apply 600 pounds of chicken pellets to the acre with a Mechanical Side Dresser	
Water at Planting	Lay 2 lines of drip tape per bed, water for one hour if no rain is predicted for that day	The transplanter puts down water each time it ejects a plant. The exact amount varies. If no rain is predicted within a couple days we will water in with a kifco water reel. Aluminum pipe is laid to the fields and then the reel is pulled out.	Sometimes we can use water with the 2 transplanters, but light-weight root balls and small plants can float; it's messy. Instead, often we'll irrigate after transplanting if needed.
Other Notes on Planting		Tops are usually trimmed a couple days before planting.	It's easy to grow nice plants en mass in open flats, but we've found that separating them and then planting tiny plants is too slow.

Crop Maintenance

Irrigation	If rain is less than 1" in the week, we drip irrigate for about 4 hours once a week to simulate 1-1.5 inches of rain. We irrigated twice this past season.	We regularly check soil moisture on field walks. Depending on heat in the summer, if there is no rain for 7-10 days we will irrigate with a set to put on 1" of water per pull.	As needed. Our currently small leek plantings share a field with other crops (celeriac in 2019), so there are compromises.
Changes to Irrigation	Stays consistent until fully matured, then will stop irrigating unless soil becomes very dry.	By Mid September we will stop irrigation usually as day length is shorter and growth slows.	Not for leeks
Hilling	I used the Terrateck wheel hoe with the L-Sweeps and finger weeder attachments . Does a great job weeding between rows and in between plants. The finger weeder pushes the soil up behind it as it rotates leaving the leeks decently hilled when done in the first month of growth.	Leeks are hilled with either spring trip shanks with large sweeps or Buffalo Ridging Wings	A slight hilling results from aggressive cultivation.
Mulching		We mulch with leftover hay to overwinter Bandit and Lexton varieties	
Weed Control	Our leeks always follow a field of curcubits, a field we always keep very clean, then by using the ground cover to create a stale seed bed before transplanting. This made a drastic difference in our management of weeds in the first 3-4 weeks, our first cultivation with the Terrateck was almost 4 weeks after transplant (and most were still at white-thread stage). In our walkways between beds we will wheel hoe this first cultivation but then leave it for the rest of the season. We keep the beds clean, but allow the weeds to grow up between the beds. The leeks seem to elongate and blanch better with only the little bit of hilling from the finger weeder. We then mow in between beds with our 30" berta flail mower not allowing the weeds to go to seed or get taller than the leeks. This year we only mowed once, but in past 3 years its been twice.	Hand weeding happens 1-2 times on average. We try to run finger weeders through the crop until hilling happens and start using finger weeders and A blades within 10 days of transplanting. We will also run larger spring trip shanks with sweeps through around 30-40 days after transplanting. The more you can build up the hill and cover weeds once hilling starts the better. Flex tine works well too to break down hills before leeks get too big. We would hill wait a week, flex tine, wait a week, and hill again.	Our usual cultivation tools- tine weeder, Kult-Kress Duo, finger weeders, sweeps on Danish tines and solid shanks.

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Insects or Pests	Thrips- we foliar spray Monterey Garden Insect Spray -2 fl. oz./gal mixed with DRAMM ONE - 2 fl.oz./gal. This is usually done around middle of July and usually takes care of the problem. If thrips persist we will apply one more time in 2-3 weeks.	Thrips occasionally, if we are spraying onions we will use Entrust to control them.	None
Diseases		No real disease problems that we have experienced	Sometimes purple blotch (Alternaria) - serious in 2019
Other Notes on Crop Maintenance		Its easy to want to plant them with your regular onions because we plant the first succession of leeks with them. The leeks are in the ground longer so we are making a more conscious effort to strategically put them in an area where we will have other fall crops. This may help with thrip pressure, but also will make irrigation easier. In 2019 our leeks were in no man's land from August till the end of the season making it more difficult to water	We sidedness additional fertility in late July/August.

Harvest and Yields

Harvest Window	Start harvesting late August and last harvest is late October - Early November.	King Richard (variety we plant in the middle row) 7/15 Rally and Megaton 8/1 We pull these varieties by first frost Lexton and Bandit are ready by 9/1 and tolerate colder temps	1st harvest is for CSA, maybe early Sept, when we have room in box. Most are harvested in Oct and Nov, with some into short-term storage.
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Harvest Procedure	<p>When we first start harvesting leeks for wholesale we will selectively harvest the largest, allowing neighboring leeks to hopefully size up a little more. We will start to harvest for CSA about 2 weeks after wholesale, and that is when we start to clear cut beds. We will continue this harvest technique for every bed. Groups of 3 work best for us. 2 people first start pulling leeks, trying to shake off some soil from roots, then tossing into piles all facing the same way. Third person starts cutting roots off, leaving little to non left when not for storage, using the front blade of a lettuce harvest knife and tossing into a new pile. Once we get about 20' into bed, one puller stops and starts cleaning leeks by stripping out layer(s) and putting into a new pile. The second puller will stop pulling and start cleaning after they get to about 50'. When the root cutter finishes their pile they will start topping leeks by cutting greens at a nice clean 45 degree angle, leaving around half the greens and making the top come to a point. They are then placed into a harvest crate that will get washed and packed in the pack shed. We will rotate positions as needed to keep the crew happy.</p>	<p>One person pulls and piles leeks. 2-3 other people start cleaning and sorting based on size. Once a pile is cleaned (old leaves peeled off and roots cut), they will be bunched. Smalls get 3-4 leeks per bunch, medium 3, Large 2 per bunch. and then the bunches get their leaves trimmed. Trimming of leaves and roots happens with a harvest knife. Some customers order by the pound, bunching is skipped with those and left loose and taken back to the pack shed for a quick spray.</p>	<p>For small harvests we loosen roots with digging fork For larger harvests, we dig with a vibrating undercutter/bedlifter, run just below the leek bottoms, that shakes some of the dirt off the roots and keeps the leeks mostly upright on top of the ground. Pull leeks over, cut roots close to bottom of leek with knife, toss into a pile. Then trim tops with a clean sharp knife into a "V" shape and strip outer layers to reveal the perfect leek inside. May have to retrim roots.</p>
Topping	<p>Use a sharp lettuce harvest knife to cut greens at a clean 45 degree angle making top come to a point.</p>	<p>Leeks are held by the root end and leaves are cut with a harvest knife 3-4" from where they meet the central shaft</p>	<p>As above</p>
Cleaning	<p>Leeks come from the field pretty clean. We use a pressure spray nozzle on our hose set on a medium width spray to quickly clean the shank and base, and spray the tops out by holding them at a downward angle so that any weed seeds fall out as you spray.</p>	<p>In the pack shed a bunch is grabbed, or if loose 3-4 leeks are taken and roots sprayed off. If muddy we will spray the entire plant.</p>	<p>Lay leeks on wire table and spray root end clean</p>

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Packing	We harvest into black bulb crates, then wash into gray fliptop storage containers with leeks facing same way for half the crate then turned and faced same way for rest of box.	From washing for farmers market and csa leeks are packed back into a clean harvest tote and placed with other crops going to those end destinations in the cooler. For wholesale they are packed directly into wax boxes, once all leeks are washed and packed they are placed with the customer's pallet of other items that are ordered in the cooler. Each case is labeled with lot code, count/weight, and destination.	For CSA, count into clean harvest totes. Weigh the finished batch with pallet jack scale. Leeks that are too long for CSA boxes are sorted out for wholesale. Wholesale boxes are 20 lbs.
Storage	We wash directly into our gray fliptops which have holes drilled into the bottom and put directly into walk-in set at 33. The fliptop containers do a great job at keeping the humidity in.	We cover all pallets with a large bag we use to line bulk bins. This helps keep things from drying out. Temp is usually 36 degrees	Cold (35F). Short term, no special conditions needed. For longer term, we trim less in field at harvest, mainly just cut roots off, then into large bins butt to butt so dirt stays off leaves. Not too humid is best.
Maximum Storage Time	We have never had to store leeks longer than 3 weeks for storage or wholesale, but they looked about the exact same as when they were packed.	In the fall before a killing freeze, we harvest into a pallet bin lined with a big plastic bag. Once full we pull excess plastic over the top and place in the cooler. 4-6 weeks is the usual time we will be able to store leeks.	3-4 months
Yields	Our average yields were 2.7#/bed foot or 270#/100' bed. King Richard yielded slightly better than Takrima.	Early in the season yield is much less because leeks are smaller. 2 bunches per bed foot early, and 3-4 later. In the fall 1.5- 2 pounds per bed foot is common.	We like to average at least 3/4 lb per leek.

Equipment

Equipment	Terrateck double wheel hoe with finger weeder and sweeps attachments. New- \$1100 Grillo 107d. New -\$3100, Used- \$1800-2500? with 30" Berta Flail Mower. New- \$1900 Used, \$1200-1500?	Finger weeding setup from Sutton Ag with A Blades and Parallelograms \$6500 Hilling Discs \$100 a pair Transplanter \$8000 Spring Trip Shanks \$25 each Ridging Wings from Buffalo \$1200	The bed lifter is a big help. Cost new about \$6,000, including freight from Europe. Good sharp knives are essential for cleanly trimming tops. Warm waterproof gloves for late fall harvests.
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Biggest Impact	The Terrateck has made a huge difference in being able to get in between the plants and rows quickly and efficiently in the early growth stage to keep the beds clean when it matters most.	Finger weeders for sure have the biggest impact on leeks. We can control weeds in row while the leeks are still very young. We are going to add torsion weeders in 2020 ahead of fingers to "stack" our tools and get more weed control and maybe eliminate a hand weeding. Timely use of these tools is critical. If you're off by a day that can significantly impact the effectiveness.	Our weed cultivators.
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Marketing

Markets	CSA, direct to restaurant	CSA, farmers market, direct to grocery, direct to restaurant, wholesale through a distributor	CSA, direct to grocery
CSA	On average we put 2 pounds into a large share and 1 pound to a small share 4 times in our regular 18 week season. Then 5 pounds into first storage share box and 3 pounds in second storage share.	In a standard share, 1 bunch or about a pound is whats given. Our choice program has opportunity to add as many bunches as they want.	Usually 1.5 lbs 3 times a season, plus 3 lbs in our winter storage share.
Farmers Market		\$3 per bunch	
Direct to Grocery		2.25-2.00 a bunch, 2.25-2.00 a pound loose. Around Thanksgiving we offer specials to our Co-Ops and if they can move a 50+ pounds per week we'll offer a lower price	\$1.60/lb
Direct to Restaurant	\$2.50 per pound	2.00 a pound	
Wholesale to Distributor		\$45 24 count case	