Johnny's Selected Seeds

8856

Winter Growing

A Guide to Winter Harvest Crops & Overwintering for Spring Harvest

JOHNNY'S WINTER GROWING GUIDE

Winter Growing

When temperatures and daylength drop, your harvest season need not come to a full stop. As more growers add high and low tunnels to their operations and participate in winter markets, we are frequently asked:

"What can I plant to harvest in winter, and when should I plant it?"

Producing marketable crops in winter requires learning the correct planting window dates for your location. We've written this guide to provide a starting point, primarily for growing within unheated tunnels. You can use the following charts and guidelines while adjusting the techniques and timing to fit your own region and practice. Remember to keep records, to determine what works best and improve upon your successes.

To begin, it is helpful to distinguish between the two main winter growing strategies. The first group you harvest in winter, the second group you leave in place over the winter to produce an early spring crop.

- **Winter Harvest Crops** are planted in late summer or early fall, primarily in high tunnels, for harvest throughout the winter.
- **Overwintered Crops** are planted in the fall or winter, often outside in the field or under low tunnels, and left in place for the earliest possible spring harvest.

There is plenty of flexibility in the methods employed, including a combination of both strategies, and many growers practice succession planting to achieve four-season production.

Scheduling Guidelines for Planting the Winter-Harvest High Tunnel

Ten Hours of Daylight

The key to scheduling your winter-harvest plantings is to identify the date when your daylength has decreased to 10 hours on its trajectory to the winter solstice. It is during this darkest time of the year — referred to by Eliot Coleman as the "Persephone period" — that growth slows to a glacial rate for most crops. The goal is to seed your plants so they are at least 75% mature by the time you enter the Persephone period. Though plants may not grow appreciably thereafter — or, until daylength has again increased to 10 hours plus — they can be harvested as needed as long as their maturity holds.

Careful scheduling allows you to control growth incrementally by planting at least two or three sowings at 7–10-day intervals, decreasing the time between plantings down to 2–5 days as you approach the Persephone period. Staggering the plantings in this way allows for crops to mature at different times and provide a longer harvest period. You might want to seed on September 20, September 27, and then October 1, for example. With well-timed, staggered plantings you can create a smooth transition from one harvest to the next for a steady supply through the winter. Multiple seedings also help you identify the best seeding dates for specific crops (which you could then record) and spread out the risk of crop failure due to unfavorable weather conditions.

Two neat tricks to get plants ready for the darkest days in high or low tunnels

1. Transplant crops like spinach that are normally direct-seeded. Start the plants elsewhere and grow them to transplant size before planting them in your high tunnel, after your summer-fruiting crops have been removed.
2. Establish hardy crops outside in late summer, then place a moveable tunnel over them, or construct a caterpillar tunnel over the crop as winter draws near.

Squeeze in even one more crop

Anticipate and plan for any open bed space that may become available in late winter, once you have harvested your winter crops. Some crops, like lettuce, will be finished in early to mid winter. Other crops, like mustards, will bolt coming out of the Persephone period. As the end of the Persephone period draws near, they can, for example, be replaced with direct-seeded spinach or brassicas. These late-winter sowings will be ready for harvest by early spring, often long before the same crop would, if grown outside.

Persephone Period

Here at Johnny's Research Farm in Albion, Maine, the Persephone Period begins on November 6th, when daylight dwindles to 10 hours, and ends on February 6th, when daylight at our latitude again reaches 10 hours in length.

You can obtain exact dates for this period for your location using an app or website such as SunriseSunset or Sundroid.

A Farmer's View

"We try to transition into winter here… we use low tunnels for some crops into the fall, and go into high tunnels as the weather turns. That way we make best use of our total space and just use the most valuable real estate when it is absolutely necessary…

"Because high tunnels are your most expensive real estate, you should consider all the costs vs. the returns of winter crops."

—Jill Rendleman
All Seasons Farm
Cobden, Illinois

Winter Production in the High Tunnel

Fundamental structural principals of high tunnel design need to be observed to build a tunnel that will survive snow load, capture optimal sunlight, and allow for regulating heat and humidity when necessary. To learn more, get connected with your local Cooperative Extension service, educational institutions, and regional grower organizations. There are numerous forums, learning events, online resources, grant programs, and other initiatives available through these and other entities.

To achieve sufficient crop protection at higher latitudes, a well-proven strategy is to place one or more layers of row cover over the crops inside the tunnel in colder months. Row cover in a variety of weights and fabrics can be used in a multitude of configurations that differ between regions, farms, and microclimates. Lighter-weight covers are sometimes left in place all the time. Other growers leave the crop covered at night and remove it on warmer days when the tunnel's internal temperature has risen sufficiently. This results in increased solar gain and ventilates excess moisture that can encourage diseases common to winter tunnels, such as downy mildews of spinach and lettuce. With some crops, the row cover can be laid directly on top of the crop. With others, some form of supportive structure is required, especially if multiple layers or heavier fabrics are chosen. From Quick Hoops™ and wire wickets to cables and metal suspension frames, various methods can be deployed to support row cover and make the daily process of removal for heat and humidity regulation more efficient.

From planting time all the way through winter, your plants will need to acclimate to cooler temperatures to prevent shock and necrosis. This adaptive process is similar to what plants undergo when you harden them off in the spring before transplanting them out, except you are heading into cooler temperatures rather than warmer ones. To effectively accomplish this, you can expose the plants to temperatures close to freezing, 32°F (0°C), as often as possible. This can be done with careful temperature monitoring, so you know when to remove row cover or roll up the sides of the tunnel, or both. If you roll up the tunnel sides, keep a close eye on the weather for conditions that might cause damage to the plants, such as driving wind, rain, sleet, or snow.

Whether going into or coming out of winter, keeping your high tunnel warm is not as essential as preventing dramatic temperature fluctuations. The key is to maintain as steady a temperature, or as even a gradation of change, within the tunnel as possible, to reduce stress on the plants. Disease pressure can develop if you do not provide good air circulation and venting of the high tunnel during the day.

After becoming properly acclimated, the cold-hardy plants should be able to tolerate a solid freeze. Remember that the plants must be completely thawed before harvesting them, so you may need to wait until the tunnel warms up, or provide supplemental heat, on harvest days.

Thorough watering is necessary to get crops started, but they will generally require very little additional water during the season, until daylength reaches 10 hours and growth resumes. Watering early in the day when the sun is out gives the plants and soil time to dry, minimizing conditions conducive to the development of disease. Use a moisture meter to avoid over- or under-watering. If you need to apply fertilizer, use mild, low-impact sources. Without the leaching action of natural precipitation within the tunnel, salt build-up can become a problem. Some growers use overhead irrigation to "rinse" the salts from the soil. Others periodically leave their tunnels fallow and uncovered, to allow rains to leach the salts.

Scheduling Guidelines for Overwintered Crops

Overwintering entails establishing very young plants that can survive the winter and resume growth extra early the following spring. Once daylength increases to 10 hours, these plantings will grow rapidly.

Keep in mind that wide fluctuations in late-winter temperatures can cause overwintered crops to bolt before they reach a harvestable stage. This can be minimized by choosing varieties with greater bolting tolerance. (See Johnny's Good for Overwintering category, which includes varieties selected on this basis in our overwintering trial programs.)

The most calculated approach to schedule seeding for overwintered crops involves seeding in the late fall, so that germination and the first stages of growth occur before the plant goes dormant during the Persephone period. Growth will begin again when days begin to lengthen.

Another overwintering method involves sowing just before the ground freezes, so that germination occurs after deep winter, as daylength increases and temperatures warm. This method can result in a lot of dead seed, however, if conditions do not pan out. (There is a risk that a higher percentage of seeds will rot in the soil during cold, wet conditions.)

An additional strategy is to seed just as the ground begins to thaw, or just as the Persephone period is ending (so technically, it is not overwintering). This works well for direct-seeded spinach and brassicas. Only the top inch or two of soil need to be thawed in order to plant the seed.

MORE ONLINE

Scheduling Guidelines for Overwintering Flowers
After several years of research and trialing, we are pleased to share the results of our overwinter flower trials. Along with this Winter Growing Guide — which pertains primarily to vegetable crops — we now offer introductory methods and recommendations for overwintering flowers, results by crop (worksheet), a seeding date calculator (worksheet), and video tutorials in our Flower Grower's Library.
Johnnyseeds.com/overwinter-flower-trials

Protection Methods for Overwintering Using Low Tunnels

Quick Hoops™ are positioned over crops to be overwintered.

We developed the Quick Hoops™ Low Tunnel Benders for creating hoops from bent steel conduit (aka electric metallic tube, or EMT). We have found that hoops made of EMT are strong enough to support heavy winter snow loads, whereas other materials, such as wire or PVC, fall short in this regard.

Using different bender styles, 3'-, 4'-, or 6'-wide hoops can be created, for fabricating low tunnels that span one or two beds at a time.

When frost is predicted, the hoops are covered with row cover (Agribon+ AG-19 or heavier) to extend the crop into the fall. These porous "blankets" protect the crop from frost while allowing them to respire and self-ventilate as temperatures fluctuate throughout the day.

After a few frosts, and once the chance of warm days has diminished, a layer of 4-mil (100-micron)-thick greenhouse film can be laid overtop the row cover. If perchance warm weather occurs after the addition of the plastic layer, you may need to manually regulate internal temperatures, ventilating the low tunnels by lifting their sides then lowering them again as temperatures drop.

In the dead of winter, the tunnels will effectively be sealed shut by the snow load on top.

Following the winter solstice, the tunnels may again need to be vented intermittently, to prevent overheating as days grow longer and warmer.

Once the danger of hard frost has passed, the plastic layer can be removed completely, with the row cover remaining in place to protect the crop until it is time for early-spring harvest.

Winter Growing, Crop by Crop

Focus on Crops for Winter Growing

Feedback received from northern growers has provided a ranking of crops proven successful for winter growing regionally. In order of popularity and degree of reliability, these crops fall into 3 tiers. Hardiness, adaptability to winter growing, and quality and quantity at harvest time also factor into the ranking.

TIER 1. Most reliably successful

Spinach, Kale, Baby Leaf Brassica Greens

TIER 2. Second most dependable

Arugula, Pac Choi, Choi Sum, Mizuna, Chicory, Cilantro, and Broccoli Raab

TIER 3. More challenging

Lettuce, Carrots, Radishes, Scallions, Bunching Onions, Leeks, Turnips

Branch Out or Specialize In

Numerous additional crops can be produced in winter, depending on your climate, risk tolerance, and market demand. You may, for example, gain success with Claytonia, Mâche, Parsley, Late-Sprouting Broccoli, or other roots, flowers, and herbs.

Crop by crop, here are some of our top performers in the winter harvest and overwintering slots …

SPINACH Tier 1

Winter spinach is exceptionally sweet and flavorful. The plant builds up sugars in response to cold, which protect its cells from bursting in freezing conditions. Spinach is also easy to grow, making it a good first choice if you are new to winter growing.

Sow your winter-harvest spinach 35–50 days before the start of the Persephone period. Spinach does not germinate well under the warm conditions that often prevail at this time. To optimize germination rates when it's warm at seeding time, irrigate before planting, to cool the soil. To ensure your desired plant density, you can alternatively start spinach in plugs or paperpot trays and grow to transplant size (two true leaves). Some growers configure LED-lit racks or shelving units in their basements to provide a conveniently cooler, indoor seed-starting environment at this time of year.

Reliable choices for winter-harvest spinach include Auroch, Sunangel, Hammerhead, Kolibri, and Space, which can be seeded in late summer through late fall for winter harvest. Seeding earlier will produce earlier harvests that will continue to grow and remain harvestable over the course of the winter. Planting in late fall, with the plants reaching approximately an inch in height by the solstice, is likely to produce harvestable spinach by February.

These spinach varieties can also be resown in winter for baby leaf production in early spring. They will grow quickly in spring, and will be harvestable multiple times before bolting.

In some regions, overwintered spinach is prone to downy mildew infection. Make sure you select varieties that are resistant to the races of downy mildew, if any, that are prevalent in your area. (Check with your Cooperative Extension service.)

KALE Tier 1

Like spinach, kale is much sweeter in the coolest months of the year.

All varieties of kale can be grown in the winter, but curled-leaf varieties are a bit hardier, and make for bigger bunches more quickly — you will spend less time harvesting the kale and your bunches will look fuller. Green curlies and Russian-types grow the fastest and are the most winter hardy, red curlies grow a little more slowly, and lacinato types grow very slowly in the winter and are the most sensitive to tipburn from the cold.

Seed kale in late July or early August for transplanting in September. Cover with lightweight row cover to exclude a variety of insect pests. Harvest from late October through March by clipping the leaves from the bottom up. It may not be necessary to protect kale if the plants are fully harvested by the time the coldest winter temperatures hit.

Kale plants of varying size can be kept overwinter in low tunnels, for harvest in early spring. The quality of the large leaves remaining in spring will depend on the severity of the preceding weather. Surviving small plants will quickly begin producing new growth.

For overwintered production of baby leaf kale, choose Red Russian for faster regrowth and exceptional cold hardiness.

BRASSICA GREENS Tiers 1 & 2

Numerous brassicas make good winter production candidates. Pac choi is one due to the thickness of its stems, which can endure a measure of freeze damage. Pac choi petioles are more likely to become pithy and stringy after being exposed to very low temperatures, if the plants have been held for a long time at a harvestable size. Try multiple planting dates and harvest when ready, to ensure they are not over-mature at your desired harvest dates. Asian leafy greens such as komatsuna, mizuna, and tatsoi, as well as other brassica greens such as arugula and mustards, will regrow and can be cut multiple times for baby leaf throughout the Persephone period. Plants are less likely to incur cold damage when repeatedly harvested at the baby leaf stage, rather than grown to full size, but may experience winter kill if planted too densely.

Choi sum (Hon Tsai Tai and Green 70D Improved) and broccoli raab (Spring Raab), too, are suited to winter production, most reliably in milder regions, as their stems and buds can be freeze-sensitive.

OTHER GREENS Tiers 1 & 2

Because they are very cold-hardy, claytonia and mâche can often be grown in an unheated hoophouse without a second layer of row cover. While they may not grow significantly during the Persephone period, they can be harvested during those darkest weeks.

Greens for winter harvest should be planted from August through October for harvest from September through March. Soil temperature when seeding should be 70°F (21.2°C) or lower, to optimize germination rates.

All of these greens will grow slowly through the winter for intermittent harvests during the coldest and darkest weeks and more uniformly into the spring for more regular harvests. For example, mâche planted in late September in the tunnel here in Maine was ready to be harvested in January and did not bolt until early March, while claytonia becomes full and beautiful as it emerges from the Persephone period, with lovely little flowers.

CHICORY Tier 2

Chicory adds intriguing diversity to a winter greens collection. Endive and escarole types (*Cichorium endivia*) are not quite as cold-tolerant as other types and can be expected to behave similarly to lettuce. Baby leaf chicory (like Clodia and Sempre Bianca) does well both planted in the fall and then in early spring for winter tunnel production. Radicchio (*Cichorium intybus*), however, shines in the winter tunnel, with superior cold tolerance, eye-catching colorations and patterns, and sweeter flavors that are not always as achievable at other times of the year.

It can be difficult to dial in the ideal planting date for consistent radicchio heading. We recommend sowing a few successions to help increase your chance of success if heading types are your target. More open-heading and faster-growing varieties such as Bel Fiore or Fiero can perform particularly well in winter. Younger radicchio plants are even more cold tolerant than mature heads and can likely overwinter with just a single layer of row cover. By late February they will start rapid regrowth, offering an extra-early harvest of unique, tasty greens to add to the mix.

Although hardy and reliable, chicory does take longer to mature than other winter "greens" and is less well-recognized by some customer segments than others; some customer education may be useful to ensure its ROI potential.

CILANTRO Tier 2

Cilantro should be sown mid September to early October in a protected structure such as a high tunnel. With mild flavor and tender leaves, overwintered cilantro lends itself well to harvesting at baby leaf maturity.

Cover plants with heavy-weight row cover when temperatures dip below freezing in the structure, but try to uncover when temperatures warm back up, to better expose the plants to sunlight and allow for air flow.

Cilantro plants will grow very slowly through the depths of winter, but take off in late winter to early spring, with harvests possible from March through May.

LETTUCE Tier 3

Lettuce is less cold-hardy than many greens, and fares best in a partially heated greenhouse or under a low tunnel within an unheated hoophouse.

We suggest harvesting the lettuces before they endure the coldest temperatures post winter solstice.

We also note that the young leaves of salad mix (baby leaf) tend to be less susceptible to freeze damage than mature lettuce heads, and similarly, that open heads are less susceptible than closed-forming heads. Crunchy, juicy varieties are more susceptible to cold damage and a decline in quality after multiple freezes.

Salanova and one-cut lettuces grown for mini heads and multicut salad mix can be very successful in heated and unheated systems. These lettuces have excelled in our winter trials in Albion, Maine when set out as transplants in late September and covered with two layers of supported row cover inside the tunnel.

One limiting factor in high tunnels is the filtering of sunlight, which diminishes the vivid red color of some lettuce varieties.

For winter growing, we recommend Five Star Greenhouse Lettuce Mix and Salanova Red Butter and Red Oakleaf for their downy mildew resistance as well as their ability to retain dark red colors.

During winter months varieties in some mixes may have varying growth rates. Some growers prefer to plant each variety individually then mix them after harvesting.

CARROTS
Tier 3

Winter-harvested carrots are super sweet. In addition, they are orange — unlike most fresh winter-harvest crops — adding a welcome touch of color to what you offer for sale.

Carrots should be direct-seeded in early August for harvest from Thanksgiving through Christmas. If grown under row cover, their tops will be protected. A display of bunched carrots with clean, attractive tops signals freshness to prospective customers.

Carrots can also be successfully overwintered as young plants, to grow and reach harvest size in early spring.

Napoli, Yaya, Aranka, and Mokum are the best varieties to plant in fall for winter harvest. Consider tighter spacings with these varieties, to maintain slender snacking carrots and higher potential yields per area.

RADISHES
Tier 3

Radishes grow speedily and, like fresh carrots, their high-contrast colors brighten up the winter vegetable palette — features that help justify production in the high-value space of the winter tunnel.

Although they are generally quite cold-tolerant, radishes will become spongy if frozen hard repeatedly.

Consider varieties with quicker maturities and shorter, bunchable tops for demonstrable freshness at market. Most small, round varieties are good for winter growing, as are the French breakfast types like Nelson. Late-maturing or daikon types are better for winter sales out of storage, as they take more time and space per plant to grow, offering a much lower ROI — plus, they store very well.

SCALLIONS, BUNCHING ONIONS & LEEKS
Tier 3

Bunching onions, also known as scallions, can be grown either for winter harvest or overwintered for spring harvest but require ample lead time. They can be planted in either low or high tunnels, but we suggest low tunnels so they don't tie up the more valuable space within a high tunnel all winter.

Direct-seed scallions in August, and begin harvesting when they reach the desired size.

For spring harvest, we start ours in the third week of August. Use our planting chart to determine the best date to start yours. (To harvest them in winter, they would need to be started in early August or even earlier.)

Different varieties are preferred for winter-harvested scallions than for overwintered scallions. For late-winter harvest, Evergreen Hardy White is good and cold-hardy, but it will bolt in the spring if overwintered. For overwintering, we suggest Deep Purple and, for a more traditional white scallion, Guardsman. Some varieties of fast-growing onions can be overwintered in low tunnels. Onions for overwintering should be sown in late August to early September, then transplanted out in late September to early October, with the goal of their having 4–5 leaves before the hard freeze in November. If they make it through the winter, you will have "bunchable" spring onions by late May to early June.

In Quick Hoops trials at our research farm in Albion, we have found that T-448 and Desert Sunrise are great for this application. Bridger also works well and is about a week later than T-448 if growers want to achieve a successive harvest.

Many varieties of leeks are winter-hardy to varying degrees. Protection in tunnels or by row covers will further enhance their survival. Oslo is a particularly winter-hardy variety.

TURNIPS
Tier 3

You can direct seed turnips in the fall. Plant enough seed to provide for a long winter-harvest period, and lay row cover over the crop if flea beetles are a problem.

Be advised that turnips will not hold into the spring, and will bolt by March in the tunnel.

The best winter turnip is the white variety Hakurei. Scarlet Queen Red Stems and the more traditional, heirloom variety Purple Top White Globe, can also work well.

Planting Dates for **Winter Harvest** Crops

Use our Winter Harvest Planting Chart as a guide, staggering your plantings for a seamless winter harvest. Keep in mind that the planting dates are back-scheduled from the last 10-hour day at your latitude. The number of weeks before the Persephone period is calculated for each listed crop. The crops are grouped, as outlined in the key, to reflect their reliability for winter production success.

	CROP	Start Transplants	Direct Seed	Weeks to Seed BEFORE Last 10-Hour Day																Last 10-Hour Day
				Week 16	Week 15	Week 14	Week 13	Week 12	Week 11	Week 10	Week 9	Week 8	Week 7	Week 6	Week 5	Week 4	Week 3	Week 2	Week 1	
TIER 1	Kale (Full)	✔			15	14	13													
	Tatsoi (Full)	✔									9	8								
	Spinach (Full)	✔	✔									8	7							
	Claytonia (Full)		✔									8	7							
	Kale (Baby)		✔										7	6						
	Spinach (Baby)		✔											6	5					
	Brassicas (Baby)		✔											6	5					
TIER 2	Chicory *(Cichorium intybus)*	✔	✔	16	15	14	13													
	Pac Choi/Bok Choy (Full)	✔								10	9	8								
	Cilantro (Baby)		✔										7	6						
	Cilantro (Full)		✔							10	9	8								
	Broccoli Raab*	✔	✔								9	8		6	5					
	Choi Sum*	✔	✔								9	8		6	5					
	Wild Arugula *(Diplotaxis tenuifolia)*		✔								9	8								
	Salad Arugula *(Eruca sativa)*		✔											6	5					
	Mizuna (Baby)		✔												5	4				
TIER 3	Carrots		✔				13	12												
	Bunching Onions	✔					13	12												
	Lettuce (Full)	✔							11	10										
	Swiss Chard (Full)	✔	✔							10	9									
	Turnips		✔							10	9									
	Lettuce (Baby)		✔										7	6						
	Swiss Chard (Baby)		✔										7	6						
	Radishes		✔										7	6	5					
OTHER	Mâche		✔								9	8								

KEY

Tier 1. Most Reliably Successful: Kale, Tatsoi, Spinach, Claytonia, Baby Leaf Brassicas

Tier 2. Second Most Dependable: Chicory, Pac Choi/Bok Choy, Cilantro, Broccoli Raab, Choi Sum, Arugula, Mizuna

Tier 3. More Challenging: Carrots, Bunching Onions, Lettuce, Swiss Chard, Turnips, Radishes

Planting Time | 9 | 8 | The number of weeks before your last 10-hour day

* Broccoli raab and choi sum can be sown at 8–9 weeks prior to the last 10-hour day for transplanting, or direct-seeded at 5–6 weeks prior to the last 10-hour day for winter harvest.

Planting Dates for **Overwintering for Spring Harvest**

Use our Overwintering Planting Chart to time your planting dates for earliest spring harvest. Keep in mind that the planting dates are back-scheduled from the last 10-hour day at your latitude. The number of weeks before the Persephone period is calculated for each listed crop. The crops are grouped, as outlined in the key, to reflect their reliability for overwintering success.

	CROP	Start Transplants	Direct Seed	Weeks to Seed BEFORE Last 10-Hour Day															Last 10-Hour Day
				Week 15	Week 14	Week 13	Week 12	Week 11	Week 10	Week 9	Week 8	Week 7	Week 6	Week 5	Week 4	Week 3	Week 2	Week 1	
TIER 1	Claytonia (Full)		✔								8	7							
	Kale (Full)	✔										7	6						
	Brassicas (Baby)															3	2	1	*
	Spinach (Full/Baby)		✔													3	2	1	*
	Kale (Baby)		✔													3	2	1	*
TIER 2	Chicory *(Cichorium intybus)*	✔	✔							9	8								
	Wild Arugula *(Diplotaxis tenuifolia)*		✔							9	8								
	Salad Arugula *(Eruca sativa)*		✔													3	2	1	*
TIER 3	Carrots		✔			13	12	11	10										
OTHER	Spring Onions	✔					12	11	10										
	Bunching Onions	✔	✔				12	11	10	9	8								

KEY	
	Tier 1. Most Reliably Successful: Claytonia, Kale, Baby Leaf Brassicas, Spinach
	Tier 2. Second Most Dependable: Chicory, Arugula
	Tier 3. More Challenging: Carrots
	Planting Time | 9 | 8 | The number of weeks before your last 10-hour day

* Some growers find little to no advantage to seeding earlier than the *end* of the Persephone period, and prefer to wait for daylength to reach 10 hours again before sowing for earliest spring-harvest crops. Although this is not an overwintering strategy by definition, it bears mention here that the brassicas and spinach listed in this chart can be seeded *at* and *after* the first 10-hour day. When sown at the end of the Persephone period, it takes these crops approximately 6–8 weeks to reach harvest stage at our latitude / growing zone (44.5°N/4b) in Albion, Maine.

With careful planning, tunnel construction, and succession planting, you can reap all the benefits of freshly harvested produce, even in the depths of winter.

Winter growing is not a straightforward process, nor one with a guaranteed return, but if you have an interest and the required resources, it can be rewarding in many ways. Chief among these:

- Your winter harvests can help you build a year-round customer base as well as retain valuable employees, support your local economy, and nourish your local community.
- Many growers find that fresh greens nicely augment a selection of winter storage crops at winter farmer's markets and in CSA distributions, where there is increasing expectation for diverse offerings.
- Fresh, locally-grown crops command a premium throughout winter and the shoulder seasons, being generally unavailable in the supermarkets and in higher demand than the same crops in summer.
- Winter-grown spinach and other greens are different from, and frequently superior to those grown outdoors during the main season or trucked in from elsewhere.

If you complete construction of your first new high tunnel in late summer, you will likely want to plant something right away. That first winter harvest can be very inspiring.

For those with just one tunnel, the prospect of ripping out high-return crops like tomatoes, cucumbers, and peppers from the tunnel in late summer may have you feeling torn if they are still producing. But as winter draws closer, the quality and quantity of those crops will decrease. Your best decision may be to replace heat-loving summer crops with ones that perform well through the darker days of the year. By combining succession strategy with construction of additional tunnels, you can reap the many benefits of winter growing.

The Bottom Line

100% *Employee Owned*

Non-GMO *Safe Seed Pledge*

100% *Satisfaction Guarantee*

Johnnyseeds.com | 1-877-564-6697