

RADISH & TURNIP

AT A GLANCE

Latin Name: *Raphanus sativus* (radish), *Brassica rapa* (turnip)

Sun: Full

Life Cycle: Annual for eating; biennial for seed

Ease of care: Easy

Direct sow or transplant: Direct sow

Height: 6 inches for small salad types, 18 inches for large storage types

Container Friendly: Salad radishes & turnips yes; large storage varieties, no.

Microgreens: Yes

Sprouts: Yes

Hailing from what we now call Southeast Asia, radishes have been cultivated for over 4000 years, moving west along the Silk Road. Ancient Egypt celebrated radishes before the Pyramids were built. Ancient Greek and Romans records describe a spectrum of small, large, round, long, mild and sharp varieties. Radishes are now beloved in countless cuisines across the globe.

Wild forms of the turnip are found throughout western Asia and Europe, where they coadapted with northern Europeans extensively for at least 2000 years.

As you grow radishes and turnips, you are joining an immense legacy of humans and plants coadapting and growing each other. In what ways is your garden growing you this season?

TYPES OF RADISHES & TURNIPS

Salad: When many of us imagine a 'radish,' we picture a small root, round & red, no larger than a golf ball. Indeed, salad radishes and turnips are petite as well as quick-growing: We're often savoring them three weeks after sowing. There are many round as well as long and narrow 'icicle' type radishes; turnips are mostly round. Though crimson skin is most common in radishes, a sumptuous spectrum of rose, plum, burgundy, white and lime green skin also exist. Salad turnips, like Tokyo Market, are often white though some are scarlet and even lavender.



Like everything, the radishes we see at the grocery store and even farmer's market is a fraction of the diversity that exists, which is a fraction of the diversity that existed a century ago. Enjoy sowing and savoring the extraordinary diversity of radishes, Friends!

Storage: Often the size of baseballs and even softballs, storage radishes and turnips are often grown in fall to overwinter in root cellars. With 50+ days from sowing to harvest (rather than 20+ for salad types), storage types are best sown in late summer so they mature into the cool of fall. Sown in spring, maturing into the heat of summer, they're often small, fibrous and spicy. Watermelon radishes

are quintessential storage radishes; Purple Top and Black Spanish are quintessential storage turnips.

Microgreens: Marvelously quick-growing, any radish and turnip seed will grow marvelous microgreens! We especially love to sow old seed with potentially questionable germination as microgreens in winter.

On Radishes, Sweetness & Spice: Radishes and turnips, though often spicy, are not inherently spicy. Their spice is in fact a response to heat stress as well as limited access to moisture and nutrients. So if you love spicy radishes, stress them out! Grow them in summer, in mediocre soil without consistent moisture: They'll be spicy as well as fibrous and may also send up a seed stalk even before their root is full-size. If you'd love sweeter roots with a juicy crunch, sow into rich soil with consistent moisture in cool seasons and in the shade (if at all) in summer.

SOW

Direct sow: Like other root crops, radishes and turnips struggle to thrive with the root disturbance of transplanting, so direct sow them always!

Days to germ: 4 days in warm soil, 8 days in cool soil

Germination Temperature: Radishes and turnips are exceptionally tolerant of early spring soils, germinating in temperatures as low as 40°F, 4°C. Optimum radish germination range is 55 to 85°F, 35 to 29°C.

Spacing within rows (a row may be a single row or a ~2 inch-wide band):

Salad radish: Sow $\frac{3}{4}$ to 1 inch apart, thinning to 1 seedling every 1 to 2 inches for full-sized roots.

Storage radishes and turnips (as well as rutabaga): Sow 10 seeds per foot, thinning to 1 seedling every 4 inches. Enjoy the baby roots as you thin them out!

Salad turnip: Sow seeds 1 inch apart. If you love small turnips, don't thin at all; thin to 2 inches apart for medium and 3 inches apart for larger roots.

To Thin or Not to Thin? One of the most challenging facets of gardening, thinning is the fine art of creating space for abundance to become. It's counterintuitive that removing life might be conducive to life, but indeed, it is. You're growing your plants to ultimately eat (kill...) them anyway, so make their lives less stressful along the way! Especially because the thinnings of so many plants are delicious, it's hugely worth overcoming your fear and stepping up to the challenge. Have your cake and eat it, too? Thin your radishes and eat them, too!

Our thinning mantra is 'early and often' because it's best to thin younger rather than older plants, especially if



Think outside the row! Though we usually sow in rows in our larger gardens, when we grow radishes and turnips in containers we often sow a carpet of them rather than rows, sowing a single seed every inch in a grid. Just be sure to thin as you do all roots! The thinnings above we washed and tucked on sandwiches for lunch.

you'd love to savor your thinnings as they grow. Thin your seedlings before their leaves overlap to ensure they are not competing above the ground for light or below the ground for nutrients. Your first thinnings of radish and turnip will essentially be microgreens and you'll be harvesting baby roots as you continue to thin in the coming weeks. Enjoy every bite!

Spacing between rows: 12 inches

Seeding depth: Radish: $\frac{1}{2}$ inch, Turnip: $\frac{1}{4}$ inch

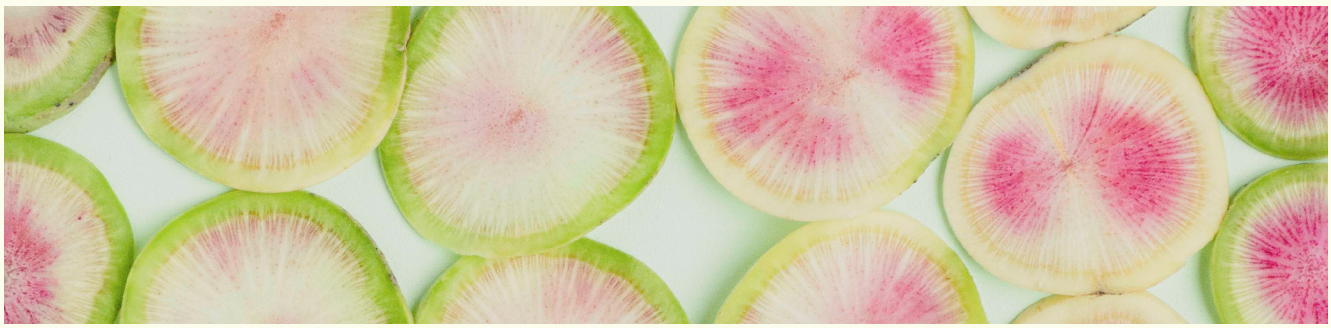
As a general rule, sow seeds twice their depth. Radish seeds are larger than turnip seeds, so we sow them just a bit deeper.

When: Undaunted by frost, radish and turnip thrive in the coolness of spring and fall. Growing sweeter with the abundant moisture of these seasons, radishes and turnips are always among the first seeds we sow as harbingers of spring.

Growing in Containers: Salad radishes and turnips are easy to grow in containers though large storage types generally do not thrive. The bigger the container and richer the soil, the greater the chances your roots will be delicious as well as abundant. In our experience, radishes can grow in containers holding less than 10 gallons of soil though they truly thrive in 10 gallons or larger.

Also, in containers, think outside the row! Though we usually sow in single or 2-inch rows in our larger gardens, when we grow radishes and turnips in containers we often





Radishes are harbingers of spring, though not all are sown in spring! With 50+ days from sowing to harvest (compared to 20+ for salad types), storage types like watermelon radish are best sown in late summer so they mature into the cool of fall.

sow a carpet, sowing a single seed every inch in a grid leaving the outer two inch diameter of the container unseeded. Since the weed pressure is generally less in containers and there is no need to navigate paths through, paired with their modest nutrient requirements, a carpet of radish is a very effective use of space. Just be sure to thin as you do all roots!

Succession Sowing: Because they grow so quickly, salad radishes and turnips can be sown and harvested from early spring to mid-fall. We sow every three weeks for continued abundance. Here are some keys for growing radish and turnip all season:

Spring: Once snow has melted and the soil has drained to be able to sow, we often sow salad radishes and turnips between early and late April here in Zone 5. Resist sowing storage types in spring, Friends! We'll soon share why.

Summer: Once we approach final frost (mid-May in Zone 5), we only sow salad radishes and turnips in the shade of larger plants (like peas and tomatoes) to reduce their heat-stress and resist becoming spicy and fibrous in summer. We also sow salad radishes, one seed every six inches, as we sow carrots! Learn more in our companion planting section.

Fall: Timing is everything!

With 50 to 60 days from sowing to harvest (compared to 20+ for salad types), storage radishes and turnips are most sweet, crunchy and succulent sown in late summer as they mature into the cool of fall. Sown in spring and maturing into the heat of summer, storage types often grow small, fibrous and spicy, so resist sowing them prior to two months before fall frost, early/mid-August here in Zone 5. For full-sized storage roots, sow no later than six weeks prior to frost.

For all inquiring minds, as Petra's mother loves to say (!), this window is also the optimal timing for rutabaga.

Timing for salad radish and turnip is less exacting, hooray! We sow our first salad types for fall about one month

before first frost and sow another succession 2 to 3 weeks later. These second successions often mature brilliantly, even if frost comes early.

Let's Talk Frost & Fall: In the first decade of Fruition Seeds growing in Zone 5, first frost came between mid-September and mid-October. How to determine frost dates as climates change? First, ask as many local growers as you can! Second, ask google and you'll find maps as well as sites you can enter your zip code; see what patterns arise from several searches. With that benchmark, keep in mind that frost dates are increasingly variable so err on the side of frost coming early just to be sure there is ample time for roots to grow as large as you'd love.

Common mistakes:

- ~ not thinning
- ~ thinning too late (after leaves are overlapping)
- ~ sowing watermelon radishes and other storage types in spring rather than late summer

Companion planting: Since they grow so quickly, salad turnips and radishes (except watermelon radish and other storage types) can be grown easily alongside slower-growing plants like peas, lettuce and even in the shade of tomatoes in summer. Just be sure to not crowd your plants and harvest your roots before their leaves are overlapping with their surrounding company!

Also, we love to interplant radish among our carrots. Here's the thing: Carrots often take 2+ weeks to germinate, even in the height of summer. Meanwhile, the weed seeds are shooting to the sky! Since radishes sprout in just a few days, we sow a single radish seed every six inches in each row of carrots, allowing us to see where the carrots are planted even if they haven't emerged yet. If we need to weed along the edges of the row (very likely, so sadly!) before they emerge, we have radishes to guide us. As the carrots are emerging, we're harvesting the young radishes to ensure they're not competing with each other. Enjoy!

CULTIVATE

Soil: Radishes and turnips thrive with full sun in deep, loose and fertile soil with ample moisture. Like all root vegetables, they struggle to thrive and grow large roots in compacted or dense clay soils. As noted above, spice is a sign of stress, often too much heat or too little water.

Radish: Optimum pH range 5.8 to 6.8

Turnip: Optimum pH range is 6.0 to 7.5

Fertility Considerations: Be sure to test your soil, if you haven't in the last year; our Soil Testing Made Simple will set you up for success. Incorporating compost and other organic soil-building fertilizers prior to planting will make a tremendous difference.

Thinning: Thinning is crucial to grow full-size radishes and turnips. Thin seedlings as soon as their first true leaves appear. Great news: these thinnings are delicious! Continue to thin as the weeks go by, enjoying tender, baby roots as you make space for your largest roots. For more about thinning, see page 2.

Weeding: As with all direct-seeded crops, it's important to stay on top of weeding to give seedlings the chance to grow without competition. Once plants are established (and won't be hindered by it), mulching is an excellent way to reduce weed pressure while retaining moisture.

Feeding: If you're eager to boost the health and nutrient-density of your radishes and turnips, foliar feed or root drench every two weeks with dilute fish emulsion or compost tea.

Pests: Flea beetles emerge in spring and though their minute munchings are tiny and damaging only to aesthetics, they're easily thwarted by floating row cover comprehensively covering your plants, with or without hoops. Cabbage root maggots can also significantly savor your roots before you do, though they're also easy to control with floating row cover, too. This pest pressure is especially strong in spring.

Diseases: We rarely see diseases on our radishes and turnips here in the Northeast, though here are four that may arise: Alternaria leaf spot, white mold, clubroot and blackleg.

Here are the easiest ways to prevent disease in all plants: Nutrient-dense soil grows healthy plants with vigorous immune systems; overcrowded plants are more susceptible to disease; water soil rather than leaves in the morning rather than evening to reduce leaf humidity. Crop rotation always helps! Finally, disease-resistant varieties make a huge difference, though even disease-resistant varieties may not thrive with cultural practices.

Season Extension: Radish and turnip are cold-hardy plants that will feed you abundantly in fall, though they succumb to deep winter here in Zone 5. Floating row cover over hoops (available on our website), cold frames and other means of season extension allow you to plant later and still harvest full-size roots later into the fall and even early winter. In our high tunnels, we're often harvesting radishes for the holidays. As a general rule, several light frosts won't damage radishes and turnips, though several hard frost will greatly reduce their quality, so we tend to harvest them all before the serious frosts become consistent.

HARVEST

Salad radishes: Radishes can be harvested and enjoyed at any size, though they'll become fibrous if left in the ground longer than 3 or 4 weeks. If you don't plan to enjoy your radishes and turnips within one week, resist washing them to prevent moisture loss.

Salad turnips: Young roots can be harvested at 30 days (and are smoothest, creamiest and turnip-sweet when small); full-sized roots are often harvested between 40



This is my father, Ralph! Harvesting a D'Avignon radish we've been selecting for a decade! Countless generations of humans and plants are embodied in each seed. Also, these radishes often grow hollow and pithy once they grow larger.

and 50 days. If you don't plan to enjoy your radishes and turnips within one week, resist washing them to prevent moisture loss.

Storage Radishes & Turnips: We begin to harvest these roots once they're the size of a baseball, often 50 to 60 days after sowing. In the right conditions, they'll quickly swell to the size of a softball! Once they size, harvest anytime before consistent hard frosts to store for the winter.



Radishes and turnips grow in a vast spectrum of colors, shapes and flavors responding to both nature (genetics) and nurture (environment). While variation is always expected (think of the variation in people!), 'squeezed' roots (far left) are often a response to stony, clay soils while spice is a stress response to high temps as well as limited water and nutrients.

STORAGE

Though we only 'store' salad radishes and turnips as pickles and kimchi (see our recipes and harvest preservation tips on pages 7 and 8!), storage types can easily surround you with delectable abundance all winter and even through spring.

Here are the simplified steps to storing your radishes and turnips through the winter at home:

- ~ shake off excess soil in garden
- ~ remove all the top greens, leaving only a scant inch of stem
- ~ tuck in a closed plastic bag and refrigerate

And here are some deeper details to set you up for greater success:

Maintain the Crown Though we don't support oligarchies (!) we do respect that storage roots with intact

skin and leaves at their crown will store the longest. To protect your crowns while harvesting, resist pulling from the stems and dig gently instead, doing your best to not damage the root with your tool.

Especially if you're hoping to store your storage radishes and turnips all winter, give your roots a wide berth as you dig them. We often place the digging fork one foot away from the roots, just to be sure we don't puncture any roots unintentionally. Enjoy any roots that do break within a week or two! To store radishes that are intact, shake off excess soil but resist washing your roots, since a layer of soil helps them store. After snipping back the foliage to within 1 inch of the root, tuck your radishes into a closed bag in the fridge, washing only those you'll enjoy for the next week or two. In root cellars, radishes and turnips are stored at 32°F, 0°C with 98% relative humidity.

SEEDKEEPING

Life cycle: Salad types are weak biennials; storage types are strong biennials.

Strong biennials like watermelon radish are crucial to grow as biennials; weak biennials, by contrast, can be grown as annuals in many climates.

As biennials, radish and turnip roots need to experience cool temperatures (ie, winter) for a period of time before they'll send up flowering stalks. Storage roots require a vernalization

period (at or below 45°F, 7°C for at least 6 weeks) to trigger a seed-producing response once re-planted; salad roots have no 'required' vernalization though 10 to 20 days in the fridge is optimal to prevent early bolting in future generations.

If you're sowing salad radishes and turnips for seed in one season, sow your roots as early as you're able. Once they're large enough to make selections, remove all but their tiniest apical leaf buds and tuck in a (labeled!) bag in the refrigerator for 10 to 20 days before replanting.

Whether you're re-planting salad or storage roots approximately as deep as when they were harvested, leaving 1' between as well as within rows. They'll soon sprout leaves and send up seed stalks, funneling all the energy stored in their roots into the next generation becoming. Since flowering stalks can be quite tall, trellising to prevent stalks from falling over is optimal, especially in humid climates.

Self or cross-pollinated: Both radishes (*Raphanus sativus*) and turnips (*Brassica rapa*) are cross-pollinated though, as unique genus/species, they don't cross with each other. *Brassica rapa* also includes napa cabbage and broccoli raab, so be sure to check in with your latin names and maintain an isolation distance of at least one half mile or cage your plants so they won't cross.

Minimum Population Size: All living populations suffer from inbreeding depression; a minimum of 20 plants and ideally 50 or more is optimal for radish genetic diversity and resilience.

Qualities to select for: Root color, shape and smoothness; leaf quantity, architecture and strength. Overall vigor with early emergence is always a fabulous selection metric! Flavor is difficult to select for in salad radishes and turnips, since they're so small and tend to not survive once cut. Storage types may be tasted and evaluated for internal color by cutting off either a circular 'cheek' of one side of the root or a thin, narrow slice. Either way, allow the wound

to 'heal over' before re-planting to prevent rot: Look for the moist cut edge to turn matte. This may take an hour to one day, depending on temperature and humidity.

Wet or dry seeded: Dry

Seed Cleaning Notes: When harvesting turnip seeds, harvest single branches or entire plants when the green pods turn gold. As you're looking for ripening seed on any brassica, keep in mind they flower from the bottom up so they ripen from the bottom up. Turnip seed pods will shatter when mature, so harvest onto a clean, hole-free cloth or tarp. For smaller quantities, harvest seed pods into a clean, dry bucket.

Compared to quickly shattering turnip seed pods, radish seed pods do not shatter on the plant, making for an easier harvest and more forgiving harvest window. Harvest the dry, brown seed pods and dry them further on screens with fans: The crispier the pods the easier the seed processing will be! Open radish seed pods by hand or (gently!) with a mallet. Use fans and screens to separate the chaff; watch our seed keeping video tutorials to set you up for success.

Seed storage & viability: When stored in optimum conditions, radish seeds hold their germination up to 6 years. Enjoy our *Secrets of Seed Storage* blog for more tips!



After vernalization, we re-plant each root in spring and if you've never seen them go to seed, it's quite astonishing: Each darling radish and turnip down at your feet sprouts a dozen or so spires rising five feet or higher, bursting into hundreds of blooms, turnips canary yellow and radish white, both mustard-y sweet. Pollinators flock to the ruckus with long, green pods emerging from each pollinated flower, turning to gold as the seed matures.

BEST OF THE BLOG

7 Seeds to Resist Transplanting
Seeds to Sow in September
Sowing Autumn Abundance in August

8 Seeds to Direct Sow in the Cold
How to Grow Microgreens at Home
4 Easy Ways to Harvest More This Fall

Ideal Varieties for Container Gardening and Raised Beds
What We Just Learned About Final Frost (& Happy Memorial Day!)
Mmmmmm! 5 Keys to Eating Greens Before Memorial Day

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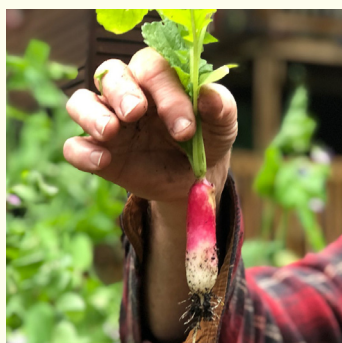
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OUR VARIETIES: SALAD RADISH



ORGANIC D'AVIGNON RADISH

HEIRLOOM Beloved in France, we are quite smitten ourselves. Thriving in the cool of spring and fall, we've been known to tuck D'Avignon beside to-

matoes to grow in the shade, even in the heat of summer.

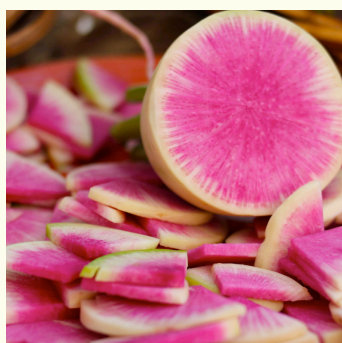


ORGANIC SORA RADISH

Gloriously easy to grow, we love Sora's classic cherry-belle, bright red and round! So vigorous, we're often harvesting Sora three weeks after we sow her, munching her delectable thinnings and it's impressive how

sweet her roots can stay, even as she sizes.

STORAGE RADISH



ORGANIC WATERMELON RADISH

HEIRLOOM If we are what we eat, let's be this beautiful! We just love these massive, crisp and marvelously juicy watermelon radishes, so sweet without any radish heat. Harvested before a hard frost and stored well, watermelon radishes are easily enjoyed all winter in curries, soups, roasted and grated fresh as salad and slaw! We also ferment watermelon radish in our kimchi each autumn.

SALAD TURNIP



ORGANIC TOKYO MARKET

Sweet, petite, juicy and mild, Tokyo Market is not your average turnip! Bright white and bite-sized, we love Tokyo Market raw in salads or on the grill, roasted or as a fabulous snack right in the garden. At Fruition, we sow these luscious turnips in spring and fall, the same timing as salad radishes, since they remain juicy and mild in the cool weather.

PRESERVING THE HARVEST:

We love to pickle radishes and turnips with vinegar as well as lacto-fermentation. Dill, garlic, curry powder, juniper berries: There are so many flavors to pick for your pickles!

❧ MICROGREENS ❧

It's easy to surround yourself with microgreen abundance! Enjoy Fruition's free online mini-course, *Microgreens Made Easy* where you'll find step-by-step video tutorials to keep it simple and fun. We love to savor microgreens all winter long and can't wait to share everything we've learned with you!



ORGANIC CONFETTI MIX RADISH

A kaleidoscope with a touch of spice, purple and green radish microgreens are one of our favorite feasts for our eyes as well as our taste buds, tossing them salads and sandwiches often ten

days after sowing. Here is enough Confetti Mix radish seed to sow three 10" x 20" trays, enjoy!



ORGANIC PURPLE RADISH FOR MICROGREENS

Gorgeously vibrant with a touch of spice, we're often harvesting purple radish microgreens ten days after sowing. Here are enough seeds to sow three 10" x 20" trays!

RECIPE INSPIRATIONS:

~ radishes and turnips are delectable raw, grilled, roast, pickled or fermented ~

An ingredient (or main ingredient of) a salad

An ingredient (or main ingredient) of slaw

Dipped in hummus or baba ganoush

In a sandwich or wrap

Tacos with radish escabeche

Nachos with radish

Kabobs on the grill

Sliced roots in ramen

Radish Raita

