

Carrots

Grow with USask



Tips for Germination

- Carrots prefer to grow in a sandy, sandy loam or loam soil. In heavy clay soils, grow carrots on raised beds of soil.
- Ideal soil temperature for seed germination is 20°C (seeds germinate in 7 days). It will take 17 days for carrot seeds to germinate at a soil temperature of 10°C.
- Good soil contact and consistently moist but not wet soil is essential for good seed germination. Some gardeners have been known to cover their newly seeded carrot rows with a layer or two of newspaper or a light board to help conserve the surface soil moisture. These coverings must be monitored and removed as soon as seeds germinate to allow emerging seedlings to grow.
- Pelleted seed refers to seed that is covered with an inert clay material. Pelleted seed is slightly larger in size than bare seed, making it easier to handle. The clay material around the seed also helps to attract moisture during seed germination.
- Ideal carrot spacing is 1.5 – 2cm between plants and 30-50cm between rows. Carrots can be thinned early in the season or throughout the season as you harvest.
- Carrot seedlings can withstand a light frost up to -2°C.
- Life expectancy of carrot seed stored under favourable conditions (10-20°C and 10% humidity) is only three years. Seeds stored under less favourable conditions will show poor germination after just a single year of storage.



The Growing Season

- Carrots are sensitive to weed competition throughout the growing season – but the slow growing seedling stage is particularly prone to being overrun by weeds.
- How to deal with weeds in carrots:
- Site selection – plant carrots in the area of the garden with fewest weeds and easy access for weeding
- Only seed the carrots once the soil is warm – otherwise the weeds will be well established before the carrots even emerge.
- Grow Danvers-type carrots as they are fast emerging and produce robust seedlings with a big top. All of these factors make Danvers-type carrots better able to tolerate weed competition.
- Remove weeds promptly and stay on top of them for the entire growing season.
- Twisted and forked carrots usually result when space between carrots is limited or the soil is too hard for carrots to easily grow into a long, straight root. Plant pelleted seed at recommended spacing or thin carrots during the season to final, optimal spacing. Plant carrots on raised beds in heavy clay soils. Grow shorter rooted carrots, i.e. danvers or nantes type.

Irrigation

- Tender, newly germinated carrot shoots will be unable to emerge through dry, heavy, crusted soil. Keep seed rows of carrots moist to encourage good seed germination. Consistent watering early in the season will promote shoot growth and help in the development of deep, straight taproots.
- Actively growing carrots prefer 2.5cm moisture/week in well drained soils.
- Excessive soil moisture will promote root rot.



Deformed carrots due to compacted soils.



Cracked carrot as a result of uneven water

Harvesting

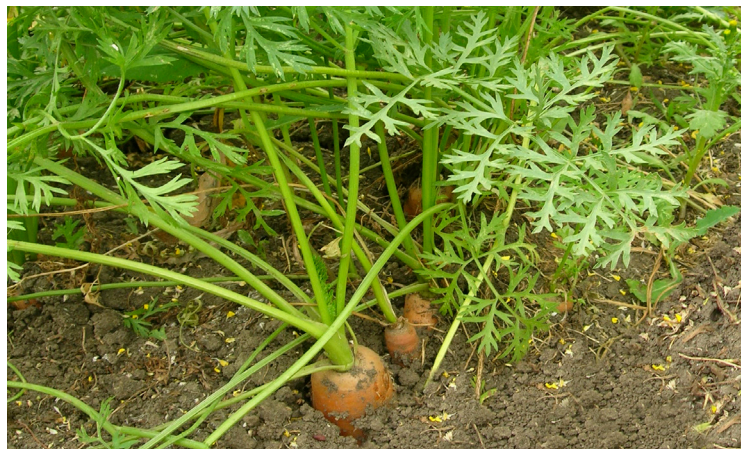
- Carrots can be harvested at any time. Young carrots are very tender but the best flavour takes time to develop.
- Oversize and overmature carrots are prone to splitting and generally taste woody and dry.
- Mature carrots with tops intact can be left in the soil as long as the soil remains unfrozen (-1°C or warmer)
- A light frost can help sweeten carrots and improve their storage quality.



Mechanical carrot harvester from a carrot processing and packaging plant in California

Storage

- Ideal storage conditions for carrots are 0°C , 95-100% humidity.
- Remove tops and excess soil before storage. If you must wash carrots before storage, wash gently: new wounds will encourage bacterial rots.
- Do not store apples in the same location as carrots. Ethylene from apples will cause bitter flavours in carrots.



Diseases

Aster yellows

Symptoms: include reddening of some leaves, starting at the crown infected plants produce a mass of spindly pale new shoots that resemble a witches broom. The roots of plants infected with aster yellows are excessively hairy and have poor flavour.

Control: The only control is prevention: minimize the number of leaf hoppers by controlling weeds in and around the garden. Avoid growing carrots near plants that attract leaf hoppers (ex. forage legumes like clover or alfalfa). Some cultivars appear to be partially tolerant of aster yellows.

Sclerotinia Mould

- **Symptoms:** White cottony mould or mycelium on the leaves near the crown is seen following extended periods of cool wet weather in late summer/fall. Once harvested, the infection spreads from the crowns to engulf the entire carrot root in a white fuzzy fungal mass. As the fungus matures it begins to form sclerotia (1-2cm long oval, hard, black resting bodies). A secondary bacterial soft rot may follow the initial sclerotinia infection of stored carrots.
- **Control:** Practise a minimum three year rotation of carrots with non-host crops in the garden (ex. Onion, beet, spinach, and corn). A good rotation would be: Year 1 = carrots, year 2 = beets, year 3 = corn, year 4 = carrots)
- Keep weeds to a minimum and provide adequate spacing between crops to ensure there is good air movement in the garden; this will help reduce relative humidity. Also avoid over-fertilizing the carrots – as this will only encourage excessive top growth which interferes with air flow near the crown.
- Avoid watering late in the evening.
- Plant carrots on raised beds. Control excessive leaf and soil moisture as well as flooding.
- Harvest when the carrots are cool –ie; less than 5°C. Grade out any obviously infected roots and trim the crowns tight to the root to minimize the amount of sclerotinia inoculum being introduced into the storage. Cool to the final recommended storage temperature of 0°C as quickly as possible. Provide good air flow and carefully maintain storage temperatures. Inspect the carrots frequently and immediately grade out any carrots showing any sign of decay.



Carrot roots affected with Aster Yellows.



Carrot tops affected with Aster Yellows.

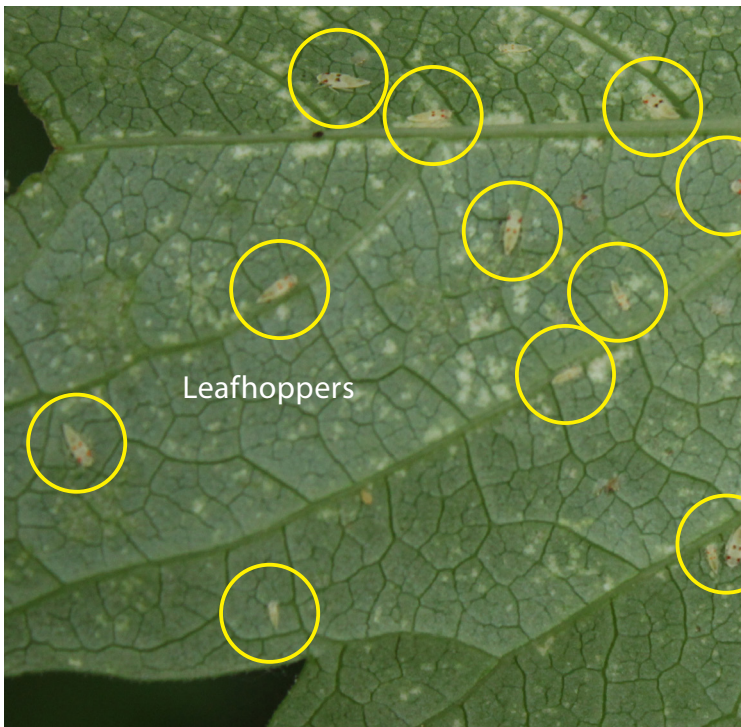


Bacterial Soft Rot and Watery Soft Rot

- **Symptoms** – a fast growing watery soft rot most commonly seen in stored carrots. Infection by bacteria soft rot requires some form of damage – such as cuts made at harvest or too close trimming of the crown. Soft rot can also be introduced by cleaning the carrots in infected wash water. As soft rot affected carrots break down in storage they produce a foul smelling bacterial slime that oozes onto adjacent healthy roots.
- **Prevention:** Handle the crop carefully to avoid root damage during harvest and storage.
- Grow carrots in a sandy to loam soil and avoid excessive irrigation.
- Cool the carrots quickly after harvest. Avoid surface moisture on the carrots, especially at warmer temperatures.

Insects

- Leaf hoppers spread aster yellows virus. Leaf hoppers overwinter as eggs in the soil.
- **Prevention:** Control weeds and avoid growing carrots near plants that attract leaf hoppers (ex. forage legumes such as clover or alfalfa)
- Keeping the carrots covered with a row cover may provide some protection against the leaf hoppers.



Leafhoppers on the underside of a leaf

Carrot Types

Imperator

Shape: Long and tapered typically found in the grocery store

Storage: Excellent

Flavour: Average to poor

Recommended Cultivars:
Arrowhead, Bremen, Eagle, Enterprise



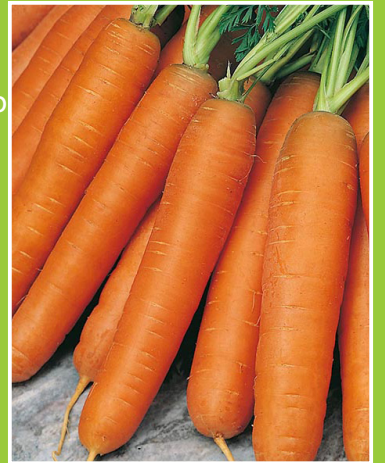
Nantes

Shape: Medium length with a blunt rounded tip

Storage: Average

Flavour: Excellent, recommended for juicing

Recommended Cultivars:
YaYa, Napoli, Bolero



Danvers

Shape: Short and tapered

Storage: Good

Flavour: Variable, younger carrots are more flavourful; tend to oversize resulting in a dry, woody texture

Recommended Cultivars:
Achieve, Big Sur, Cordoba, Danvers Half Long

