Soil
Carrots need deep, well-drained sandy loam to sandy soil, and the texture is very important because it affects how smooth and well-shaped the roots will be. Avoid heavy, compact soil which will discourage growth. Soils high in fresh organic matter can result in hairy, forked and malformed roots, and stony soil can also produce poor root shapes. The optimum pH is from 6.0 — 6.5.

Temperature
Carrots are cool-weather plants, but growth slows down if the temperature drops below 10°C. Although not usually sensitive to frost, severe frosty spells can damage the leaves. Roots can be damaged if the soil temperature drops below 0°C, especially if the plants were irrigated the preceding afternoon. The temperature and soil moisture influence the colour, shape and quality of carrots. Growth is optimal at 18 — 23°C, although some cultivars can withstand a great deal of heat. High temperatures (above 29°C) affect emergence and quality negatively, causing poor colour and thicker centres.
Crop rotation
Rotating crops helps to improve the quality of the soil and keep down soil-borne pests. Carrots make good crop rotation partners for cabbage, lettuce, pumpkin and tomatoes. If rotated with leguminous crops, such as peas and beans, they improve the soil’s nutrient levels.

Preparing the soil
Loosen the soil thoroughly by ploughing (or using a fork, hand hoe or spade) to a depth of 300 — 400mm to allow for good root aeration, root penetration and drainage. Crush all clods with a rake or cultivator to obtain a deep, fine tilth. Remove stones because they can cause poorly shaped carrots. Even build a raised bed. Remove all weeds before sowing because carrot seedlings are very fine and cannot compete with weeds.

Spacing
Allow 25 — 35cm between rows. Thin out at one to two weeks after emergence, when the carrot seedlings are about 4cm high, and again one to two weeks later. This should result in a spacing of 4— 5cm within the row (80 — 120 roots/ m2). Do not thin out later than four weeks after emergence. If the crop is not thinned out, the carrots will be small and malformed. Thinning should take place in the afternoon, and when soil is moist.

Applying fertiliser
Apply about 1 000kg/ha (100g/m2) of a fertiliser mixture such as 2:3:4 (30)+Zn or 1 100kg/ha (110g/m2) of 2:3:2 (22)+Zn just before planting and work it into the top 10cm of soil. Apply a top dressing of 10g LAN per metre of row at three weeks and again at six weeks after emergence. Sprinkle on both sides of the row, 2 — 10cm from the plants (do not sprinkle on the plants). It would be a good idea to remove all the weeds before applying LAN in order to avoid their competing with the carrots for fertiliser. Work into the top 2cm of the soil, using a flat-tined fork. Water well.

In areas known to have a boron deficiency, apply 10 — 20kg/ha borax after planting. Do not use manure and compost for carrots, because they can cause malformation of the roots and decrease the marketable yield. If manure needs to be dug in, do so with the crop preceding carrots.

Cultivar list
Kuroda offers an excellent yield and has a good shape. It’s 11 — 15cm long and has a thin kernel. It can be produced in warmer seasons. Cape Market is cylindrical, 12 — 17cm long and produced in warmer seasons. Scarlet Nantes, Flacoro, Fancy and Duke are good choices for autumn planting. Other spring cultivars are Ideal Red and Javelin.

How to sow
Rake the soil surface to a fine-tilth seedbed before sowing the small carrot seeds directly in the soil — carrots cannot be transplanted. Put the seeds in the palm of one hand, take a substantial pinch with the fingers of the other hand and rub between finger and thumb as you move your hand forwards and backwards along shallow (1,5cm deep) furrows, until the desired sowing rate is achieved. Another method is to mix one teaspoon of seed with 10 teaspoons of and and then sow it. Seeding requires some experience and practice.

After sowing, cover seed with fine soil to ensure better germination. In the warmer months, mulch the rows with dry grass to keep the soil cool and moist, as this will assist germination. Remove the mulch after the seedlings have emerged. (If it is kept on too long, the seedlings will become leggy and the sun will burn them easily.) Emergence may take 7 — 14 days depending on the cultivar, the weather, soil type and season.

Important: You will need 3 — 4kg seed. For smaller plots, allow 1g (1 teaspoon) per 2m of row.
**Irrigation**
Keep the soil moist after sowing the seeds to ensure good germination. Water carrots regularly throughout the growing season, but take care not to water too much. As a general rule, carrots need about 30mm of water per week. Water every five days if the weather is warm and dry.

**Managing the crop**
Start off with a weed-free plot so that the carrots do not have to compete with them for nutrients and water. Then weed carrots regularly to keep them free of weeds. If you see any weeds appear, remove them immediately. Being weed-free has a substantial effect on the yield — and your profits. Be particularly careful to remove perennial weeds because they can grow between the roots and will result in poor-quality carrots.

**Harvesting**
Carrots grow for 10 — 12 weeks from emergence to harvesting, depending on the cultivar and the temperature. In small gardens, harvest them as soon as they reach a diameter of 20mm but are still young and tender. Make sure the soil is wet when you harvest carrots, to make them easier to remove, either pulling out by hand or first loosening them carefully with a fork (start 15cm away from the base of the plants) and then pulling them out. Harvest carrots when they are fully mature as this increases their shelf-life. Do not harvest early in the morning if the soil is cold, as this may cause the roots to crack horizontally. Do not leave carrots in the sun after harvesting — take them to a shady place.

**Storage**
Most horticultural crops are perishable and can only be stored for a few days. It is best to harvest carrots as needed for consumption or selling. Remove the leaves before storing, to extend shelf life. Fresh carrots, harvested when mature, will keep for up to five days at room temperature (20°C), and for 7 — 21 days in a refrigerator.

**When to sow**
The following sowing times are recommended for the different regions:
- **Highveld:** August to mid-March.
- **Middleveld (temperate climate zones):** August to mid-April. In very warm areas, August to September and February to March.
- **Limpopo and Lowveld:** February to April and July to August.
- **Free State and Northern Cape:** August to October and end of January to March.
- **Kwazulu-Natal (Midlands and coastal region):** August to April.
- **Eastern Cape:** July to April, but NOT in mid-summer in very warm areas. In very cold areas, August to April.
- **Western Cape:** August to end of March.

**Diseases In carrots**
The most important diseases occurring are Alternaria leaf blight, bacterial leaf blight and cottony rot. Control recommendations:
- Rotate crops.
- Plant in well-drained soil.
- Water early so that leaves can dry before nightfall. Do not over-irrigate.
- Burn diseased plants.
- Fertilise plants well.
- Control weeds in and around fields. Remove all plant residues from the field after harvesting.

**REMEMBER:** There are no registered disease-control chemicals for carrots. Pests include nematodes (crop rotation is important to control these) and cutworm and carrot fly. Scout regularly, spray with registered chemicals and use cutworm bait.
### RSA sowing and planting chart for the most popular vegetable crops*

<table>
<thead>
<tr>
<th>Crop</th>
<th>Sowing time</th>
<th>Transplanting time</th>
<th>Harvesting time</th>
</tr>
</thead>
</table>

*Please consult the seed company in your region regarding cultivars, which vary from area to area.*