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PRODUCTION GUIDELINES / SOUTH AFRICA

# Carrots



**PLAN THE ROOT. ESTABLISH EVENLY. PROTECT QUALITY.**

Practical guidance for fresh-market and processing carrots. Build an even stand, manage root quality and maintain a reliable cold chain.


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01 / CROP PLANNING

# Grow for the required grade

Scope: carrot roots (Daucus carota) for fresh sale, bunching or processing. Seed production and a commercial fresh-cut processing line need separate programmes.

## Agree the product before the population

Confirm root length, diameter, shape, colour, core quality and trim. Whole baby carrots and cut-and-peeled products have different raw-material requirements. Choose a cultivar for the product and local season, then set the target stand with the seed supplier and buyer. [1, 2]

| Market / decision | Record in the crop plan |
|---|---|
| Loose fresh roots | Target size band, shape, skin finish, colour, permitted defects and pack mass. |
| Leafy bunches | Root grade plus top freshness, bunch count, trim and delivery frequency. |
| Processing | Dicing, slicing or cut-and-peel use; dimensions, internal quality, harvest method and delivery condition. |
| Cultivar and lot | Local trial performance, maturity, bolting risk, seed count, germination, treatment and pelleted or raw seed. |
| Harvest capacity | Area per harvest day, lifting method, grading labour, wash water, cooling, packaging and transport. |

## Select the local planting window

Carrots generally favour cool conditions. KZN guidance identifies 15-20°C as favourable for growth and quality. Heat can make establishment difficult; cold can slow development and contribute to bolting risk in susceptible material. Use local experience instead of a single national sowing calendar. [1]

**Plan saleable roots:** budget by accepted grade after sorting. Record undersize, oversize, cracked, forked and diseased rejects separately. Sample roots through the block as harvest approaches; lush tops alone do not confirm that the root specification has been reached.

# Make emergence uniform

Carrots are normally direct-sown. Their small seed and delicate seedlings make seedbed condition and moisture control especially important.

## Prepare for the full root length

Choose deep, well-drained, friable soil and investigate compaction before sowing. Remove major stones and clods. Avoid overworking the surface into a crust-prone layer. Heavy or compacted soil can distort roots and complicate lifting. [1, 3]

| Checkpoint | Starting guidance |
|---|---|
| Depth and rows | Legacy KZN guidance uses 10-25 mm sowing depth and 200-400 mm rows. Choose the shallower end where crusting or cold soils limit emergence; confirm depth for the actual soil and seed lot. [1] |
| Seed handling | Pelleting can improve accurate metering. Calibrate the planter with the supplied seed, check placement in the bed and follow the supplier's moisture requirements. [2, 3] |
| Emergence | The 2026/27 commercial guide notes that emergence can take 10-21 days. Keep the seed zone consistently moist without saturation and investigate gaps before assuming seed failure. [2] |
| Final population | Set plant numbers for the desired grade, cultivar and bed system. Count emerged plants over measured areas and compare against the planned stand. [1] |

## Calculate seed numbers, then kilograms

Example only: a target of 100 plants/m² of planted bed, 90% laboratory germination and 80% survival of germinable seed requires 100 / (0.90 x 0.80) = about 139 seeds/m². Apply this only to the planted area; convert to seed mass using the actual lot count.

**Avoid double counting losses:** define whether the field-emergence percentage already includes laboratory germination. Count paths and headlands separately. Use a short calibration strip to verify the planter setting before sowing the full block.

# Build roots consistently

Use soil and water analysis, field history and an achievable marketable yield to set inputs. Reassess the crop during root enlargement.

## Manage the seed zone, then the root zone

Keep the shallow seed zone moist during emergence. As roots develop, check wetting depth and irrigation uniformity, using soil readings, rainfall and weather to adjust applications. Avoid persistent saturation and large dry-to-wet swings. Drought and poor soil structure can contribute to splitting or misshapen roots. [2, 3]

## Feed for balanced growth

Translate the soil report into nutrient amounts with a local adviser. Credit previous inputs and test before applying extra nitrogen. Excess nitrogen can favour tops at the expense of root growth. Do not prescribe a routine boron correction without confirming need and a safe rate. [2, 3]

| Quality warning | What to check |
|---|---|
| Forked or hairy roots | Inspect for stones, compaction and early root injury. Nematodes are another possible cause; sample rather than assuming one diagnosis. [3, 5] |
| Strong tops, small roots | Check crowding, cultivar, crop age and nitrogen supply before increasing fertiliser. [3] |
| Green shoulders | Check exposed crowns. Keep shoulders covered gently without damaging the growing point or roots. [2, 4] |
| Uneven root sizes | Compare emergence dates, actual stand, moisture delivery and soil variation. Separate dense patches from gaps in the field record. |

## Control weeds while they are small

Use shallow cultivation or other suitable methods early and avoid root injury. Record problem weeds for the next crop plan. Any herbicide must have a current approved carrot use for the intended application. [3, 8]

**Review inputs by block:** irrigation and rainfall / soil-moisture readings / fertiliser and nutrient totals / stand counts / sample root size / defects / action taken. Compare marketable results with the plan after harvest.

04 / CROP HEALTH

# Protect leaves and roots

Inspect seedlings, tops and sampled roots. Record the affected area, weather and field history; similar symptoms may require different management.

| Problem to investigate | Prevention and response |
|---|---|
| Alternaria leaf blight | Older leaves may develop brown spots with yellow margins, followed by scorched-looking foliage. Weak tops can break during mechanical lifting. Ask about tested seed, manage residues and avoid repeated carrot cropping. [6] |
| Bacterial leaf blight | Water-soaked brown spots, leaf loss and dark petiole streaks can resemble other blights. Seed and crop debris can carry the bacteria; splash spreads infection. Use appropriate seed-health testing and obtain diagnosis. [7] |
| Root-knot nematodes | Galls, forks or stunted roots warrant soil and root sampling. Identify the nematode and choose rotation crops accordingly. Once the taproot is damaged, treatment cannot restore its shape. [5] |
| Root rots / damaged seedlings | Check drainage, insects, soil conditions and root injury together. Separate diseased roots at lifting and keep them out of storage. [4, 9] |

## Plan prevention before planting

Use the diagnosis to choose field sanitation, rotation and cultivar measures. Alternaria guidance supports non-carrot rotation and decomposition of infected residues. Nematodes have different host ranges, so a leaf-blight rotation is not automatically a nematode solution. [5, 6]

**Before treatment:** confirm South African registration for carrots and the diagnosed target. Follow the approved label, re-entry and preharvest intervals and protective equipment requirements. Keep application records and check buyer or export residue limits. Avoid routine fumigation or calendar sprays without a field-specific justification. [8]

05 / HARVEST & STORAGE

# Keep roots crisp and sound

Lift when sampled roots meet the buyer's grade. Use crop development and measurements, rather than a fixed number of days, to schedule harvest.

## Lift, sort and cool promptly

Set lifting equipment to avoid cuts and broken tips; handle roots gently. Remove damaged and diseased roots. For topped carrots, trim cleanly to specification. Keep bunched carrots shaded, preserve top quality and move rapidly into cooling. [2, 4]

| Product / checkpoint | Postharvest guidance |
|---|---|
| Cold-room target | UC Davis recommends 0°C and 98-100% relative humidity. Avoid freezing, and distinguish high humidity from standing water or condensation. [4] |
| Bunched carrots | Highly perishable because tops remain attached. A reference potential is 10-14 days at 0°C; plan prompt sale and inspect regularly. [4] |
| Immature topped roots | A reference potential is 4-6 weeks at 0°C. Actual performance depends on cultivar, handling and the cold chain. [4] |
| Mature storage carrots | Selected sound mature roots may hold for months under controlled conditions. Do not transfer that expectation to tender young roots or leafy bunches. [2, 4] |
| Mixed storage | Keep carrots away from ethylene-producing produce such as apples; exposure can cause bitterness. [4] |

## Manage wash water and dispatch

Use a hygienic wash or hydrocooling system where appropriate, with water quality and sanitation checked. Cool promptly and avoid recontamination. Use clean packs and monitor product temperature through storage and transport. [9]

**Record the lot:** block / harvest date / root grade / accepted and rejected mass / wash and cooling records / product temperature / pack / customer. Confirm the selling window using retained samples from the actual lot; storage references are not guarantees.

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FILLABLE CROP PLANNER

# Your next planting

Save a copy before filling it in. Use a PDF reader that supports forms and keep the completed record with your field documents.

**Farm / block / previous crop**

**Type / cultivar / seed or seedling lot**

**Planting date / expected harvest window**

**Bed and row layout / plant population / area**

**Buyer / root size / bunch or topped / pack**

**Soil and water results / nutrient plan**

**Next action / responsible person / due date**

## Ready-to-plant checks

- [ ] Buyer specification confirmed
- [ ] Seed and planting plan checked
- [ ] Rotation and crop health checked
- [ ] Soil and water reviewed
- [ ] Irrigation delivery checked
- [ ] Cooling / processing arranged

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REFERENCES & EDITION NOTES

# Sources you can follow

Independent sources reviewed on 17 September 2026. Links are clickable. Older sources support established principles; overseas dates and product approvals are not transferred to South Africa.


**01. KZN Department of Agriculture - Carrots (legacy bulletin)**
Local climate, seedbed, sowing depth and population principles.

**02. Mid-Atlantic Commercial Recommendations - Carrots (2026/27)**
Establishment, soil-test inputs, harvesting and storage distinctions.

**03. UMN Extension - Growing carrots and parsnips (2022)**
Carrot seed handling, moisture, weeds and root-quality problems.

**04. UC Davis Postharvest - Carrot**
Maturity, product-specific storage, humidity and ethylene.

**05. UC IPM - Nematodes in Carrots**
Root injury, sampling and species-specific management.

**06. UC IPM - Alternaria Leaf Blight of Carrots**
Symptoms, seed transmission, residue management and rotation.

**07. UC IPM - Bacterial Leaf Blight of Carrots**
Symptoms, tested seed, splash spread and crop residues.

**08. SA Department of Agriculture - Maximum Residue Limits**
Crop-specific registration, records and destination requirements.

**09. Penn State Extension - Keeping Produce Fresh**
Hygienic handling, washing and cooling principles.


**About this edition.** Original AgriCart editorial synthesis for planning and education. Obtain farm-specific advice before setting inputs and crop-protection programmes. No yield or shelf-life guarantee is implied. Cover image is AI-generated illustration, not a documented farm or named cultivar. Source organisations do not endorse AgriCart.