

CARROTS

CROP PRODUCTION GUIDES

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The carrot (*Daucus carota*) is the eponym of the Apiaceae, the carrot family. Its domesticated ancestors were first grown some 5,000 years ago in areas of today's Afghanistan. Originally they were purple, black or even white coloured with a bitter taste. The orange coloured carrot as we know it was developed by a Dutch patriot in the 15th Century. At about the same time they were introduced to Great Britain.

Carrots are high in antioxidants and contain a lot of pro-vitamin A which can help to maintain the eyesight. Carrots are a major root crop in the UK with an annual planting area of 9,000 hectare. Their sales value is around £280million per year.

SITE

To avoid getting forked roots, the soil should be stone free. Light soils, well drained and peaty soils are ideal for cultivation. High organic matter content is recommended but ensure farm yard manure is well rotted and applied a few months before planting to avoid getting forked roots. A pH above 6.0 is required for successful establishment.

TYPES AND VARIETIES

Nantes type – Quite a large (Nigel F1 can reach between 15 and 20 cm), cylindrical shaped type with Nairobi as typical variety. Well used type which is supposed to be the first genuine autumn sowing carrot.

Chantenay type – Originated in France but often planted in the UK. This type is often referred to as the most popular carrot with a fleshy colour and a stocky, tapered shape. Varieties include “Royal” and “Chantenay Red Cored”.

Amsterdam type – With 12 – 17 cm a smaller type mostly used as an early variety. Quickly maturing with hardly any core. Varieties include “Amsterdam Forcing” and “Amsterdam Sweetheart”.

PLANTING

Carrots are grown from seeds. The ideal sowing time is March/April, about 2 weeks before the last frost is expected. However, there is the possibility of establishing a “forced crop” which is sown as early as February using cold frames or cloches for protection. If sown in October, a fleece or plastic cover is needed over winter. Sowing is possible till July but late crops are more affected by the carrot fly.

Seeds are sown about 2 cm deep with a precision drill such as Mini Air or Stanhay. Between row spacing is 15 to 30 cm with approx. 100 carrots per m². If beds are used then more seeds should be placed on the outside rows of the beds. Barley or mustard is sometimes used as a cover crop to avoid soil loss through wind. The ideal soil temperature for germination is 10°C.

CROP NUTRITION

Table 1 shows Defra's fertilizer requirements. However, cropping history and soil analyses might suggest different levels of fertilizer input.

Table 1 – Fertiliser recommendations for carrots from RB209

	SNS, P, K or Mg Index						
	0	1	2	3	4	5	6
	kg/ha						
Nitrogen	110	60	20	0	0	0	0
Phosphate (P ₂ O ₅)	200	150	100	50M	0	0	0
Potash (K ₂ O)	275	225	175(2-)125M(2+)	35	0	0	0
Magnesium (MgO)	150	100	0	0	0	0	0

Source: Defra – Fertiliser recommendations for agricultural and horticultural crops (RB209)

MANAGEMENT

Carrots require 20 mm of rainfall per week during the growing season. Overhead systems or sprinkler lines are mainly used for irrigation.

Weeding in the early stages is necessary and can be done by hand on small scale plots. On a larger scale, the usage of a spray, e.g. Linuron, is recommended.

At a root size of approx. 5 cm the application of straw or manure can help to keep the soil moisture high. If soil moisture levels decline and the root tops are exposed to the sun, carrots get vulnerable to “green shoulder” and develop a bitter taste. Covering with fleece or plastic covers or, traditionally, with straw might also be necessary as shelter when temperatures are low.

PESTS AND DISEASES

Carrot fly (*Psila rosae*) is the biggest worry for growers. If the infestation is severe, the foliage will turn a rusty colour first and then yellow. Infected roots show small holes and the root end is dark. The female flies are attracted by the scent which suggests planting strong scented plants (e.g. onions) between the rows which may act as deterrent. Nevertheless, the results from this method are mixed. Protection can also be provided by micronets or by the use of resistant varieties. Insecticides in form of dust or spray containing pirimiphos-methyl are also available.

Leaf blight (*Alternaria dauci*) is a fungal disease which will affect the foliage first, causing wilting and browning. In severe cases, it can kill the whole top. Contaminated carrots have a black ring at the top of the root. Control and the application of fungicide spray (active ingredient: difenoconazole) are recommended in wet seasons.

Nematodes, e.g. *Heterodera carotae*, cause initiation of secondary roots used as hosts by the nematode.

HARVEST AND STORING

Harvesting can be done either by hand (depending on soil conditions the help of a fork is needed) or with a top lifter. Careful handling is necessary to avoid bruising or breaking the roots. To avoid exposing the roots to heat, harvesting it is often done after sunset during the hottest summer months. Also do not leave harvested carrots for too long on the field as the smell can attract the carrot fly. Washing after harvesting can be done either by hand with a pressure washer or, when producing on a large scale, in a washing line.

As carrots can get rubbery relatively easy it is necessary to store them below 5°C, ideally at 1 – 2 °C. Alternatively, leaving them in the ground till they are required is also possible. This method can only be used when temperatures do not go below 0°C.

Carrots are either sold loose without foliage or bunched with 10 carrots tied together including the top. The latter is especially used in farm shops and road stands and can attract premium prices.

Indicative margins for one hectare of carrot production

	Item	Quantity	£/Unit	£ Total
Outputs				
Crop Sales	tonne	65000	0.10	6500
			Total Outputs	£6500
Costs				
Casual Labour	Grading/planting	120	6.00	720
	Harvesting/packing	60	6.00	360
Fertiliser Costs	Fertiliser	0.6	200	120
Other Costs	Packaging/Transport/...			2800
Seed Costs	Seeds	3	100	300
Spray Costs	Pesti-/Herbicides			250
			Total Costs	£4550
Gross Margin				£1950

Source: Various



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