Activity # 1- Assessing Horticultural Crop Suitability for the Queensland Murray Darling Basin Study Area

Specific Biophysical Crop Information - Carrots

(1 August 2014 to 30 June 2016)

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This publication has been compiled by David Carey of Agri-Science, Department of Agriculture and Fisheries.

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Carrot

Based on the biophysical requirements and limiting factors, **Carrots are a potential crop** for the Balonne-Border Rivers Region of the QMDB.

Crop Matrix:-

	Annual Crop	Carrot
Currently Grown (Y/N)	Qld	Y
	QMDB	Y
	NSW	Y
	Vic	Y
Frost Sensitivity (N or Deg C)	Seedling	Y
	Growth	N
	Reproductive	N/A
Low Temp Sensitivity (Y/N or Deg C)	Seedling	N
	Growth	N
	Reproductive	N/A
High Temp Sensitivity	Seedling	Y
	Growth	N
	Reproductive	N/A
Rainfall Sensitivity	Y/N	Y
	Growth Phase	Harvest
Special Soil Requirements	Y/N	Y
	Requirement	Prefers light soils
Chilling Req.	Y/N	N
	Amount (hrs)	
Water Quality	Sensitivity (dS/m)	0.7 (1.2)
First Planting Date	(Month)	March
Last Planting Date	(Month)	June
Consecutive Plantings	(Y/N)	Several
First Harvest	(Month)	May
Last Harvest	Month)	Sept
Length of harvest	(weeks)	16
QMDB	Y/N	Y

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Carrot (*Daucus carota*) is a member of the Umbelliferae family. Other vegetable crops and herbs in this family include celery, parsnip, parsley, dill, caraway, anise, coriander and fennel. Carrots are produced for a variety of uses though fresh market production for retail sales is the major market. Value added packed carrot include peeled baby carrots, carrot sticks and shredded carrots. Processing markets include baby food production, as well as some frozen and canned products.

Biophysical Requirements and Limiting Factors (climate)

Carrots are a cool-season crop but will tolerate warm temperatures early in the growing season.

Temperature

Carrot roots attain optimal colour when the air temperature is 18º to 21^{oC}, temperatures above 30^{oC} reduce foliage growth and root quality. Although the crop can be grown outside this range with little or no effect on tops, temperatures differing drastically from the above can adversely affect root colour, texture, flavour and shape. Lower temperatures cause slow plant growth and make roots longer, more slender and lighter in colour. Temperatures below 10^{oC} cause carrot roots and foliage to grow slowly, greatly reducing plant size and yield - mature carrot plants will tolerate some frost.

Soils

Although they can be grown on a range of soils, sandy loam soils allow proper growth and development of long, smooth, straight roots which modern markets demand. Soils cannot have excessive stones, pebbles and debris as this can cause forked or misshapen roots. Soils should be well drained as carrots will not perform well under water-logged conditions. Sites should have loose, friable soils to a depth of 30 – 40 cm with no underlying hardpan. Deep sandy soils will require more frequent irrigation.

Rainfall

Soils should also be well drained as carrots will not perform well under water-logged conditions.

Irrigation

Carrots are commonly grown in lighter soils with a low water holding capacity making irrigation essential for consistent high yields and quality. The most serious yield reductions result from water stress during germination and during root expansion. Water stress during the establishment of carrots delays maturity, reduces leaf area and will reduce yield. Overwatering in poorly drained soils will result in misshapen roots, forking and promotes diseases of both foliage and roots. Water use will range between3 and 5 ML/ha depending on irrigation method, location and temperature and soil type.

Production

Summer carrot crops can be ready for harvest in 16 weeks from sowing, while crops growing through the cooler months may grow for up to 24 weeks. There are a wide range of carrot varieties such as Dutch carrots (these are small and sweet), Imperator, Nantes and Kuroda.

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Mechanisation and Packaging

Carrots are a highly mechanised crop, initial planting with a precision seeder is followed by machine harvesting, then washing, sorting, cooling, grading, packing and bagging in highly mechanised packing sheds. Carrots are packed into 10, 15 and 20 kilogram plastic bag-lined cardboard cartons or into 0.5 and 1 kilogram retail ready pre-pack bags.

Marketing

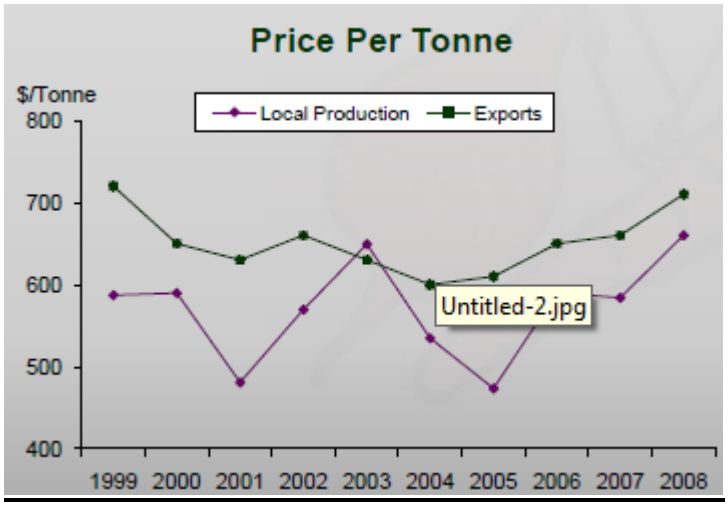
The Australian fresh market carrot industry is dominated by a small number of grower / packers who grow in multiple locations

Exports are exclusively fresh, with markets developed in Asia (Singapore, Malaysia, and Japan) and in the Middle East. Western Australia has a strong export focus.

The Middle East is a major market, with the United Arab Emirates the largest importer of Australian carrots and Saudi Arabia ranked fourth. Bahrain, Qatar and Kuwait are also in the Top Ten.

(Source: http://ausveg.com.au/statistics/website/Carrot%20Commodity%20Report%20June%202010.pdf)

Domestic Price per Tonne up until 2008



National production is fairly concentrated in three states which accounted for 70% of total production in 2009: Western Australia (31%of the national total), Tasmania (23%) and South Australia (17%).

(Source: http://ausveg.com.au/statistics/website/Carrot%20Commodity%20Report%20June%202010.pdf)

Crop Lifecycle

Seeding to harvest: 100-140 days

Fassifern /Lockyer Valley Fresh Carrot Growing Season (Months)	J	F	M	A	M	J	J	A	S	O	N	D
Plant			■	■	■	■						
Harvest						■	■	■	■	■	■	

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Comparison Region(s)

Crop in QMDB Region.

Based on the biophysical requirements and limiting factors, Carrot is a potential crop for the Balonne-Border Rivers Region of the QMDB.

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Disclaimer: The candidate crop information presented in this QMDB study area report (Activity 1) are based on the analysis of the published biophysical needs of the crops (e.g. temperature, frost sensitivity, chill requirement, water quality, etc.) and current climate records for the QMDB study area. The candidate crops are deemed suited to the study area where the biophysical needs are met either year round or for portion of the year and will allow crop production.

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