

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

## **Specific Biophysical Crop Information - Cauliflower**

(1 August 2014 to 30 June 2016)

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Citation: Carey, D., Deuter, P., Zull, A., Taylor, H., White, N (2017) High Value Horticulture Value Chains for the Queensland Murray-Darling Basin Project: Activity 1 – Assessing Horticulture Crop Suitability for the Queensland Murray Darling Basin Study Area report. Queensland Government Department of Agriculture and Fisheries.

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

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## Cauliflower

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

### Crop Matrix:-

|                                     | Annual Crop        | Cauliflower |
|-------------------------------------|--------------------|-------------|
| Currently Grown (Y/N)               | Qld                | Y           |
|                                     | QMDB               | Y           |
|                                     | NSW                | Y           |
|                                     | Vic                | Y           |
| Frost Sensitivity (N or Deg C)      | Seedling           | - 5°C       |
|                                     | Growth             | N           |
|                                     | Reproductive       | - 5°C       |
| Low Temp Sensitivity (Y/N or Deg C) | Seedling           | N           |
|                                     | Growth             | N           |
|                                     | Reproductive       | - 1°C       |
| High Temp Sensitivity               | Seedling           | N           |
|                                     | Growth             | N           |
|                                     | Reproductive       | Y           |
| Rainfall Sensitivity                | Y/N                | Y           |
|                                     | Growth Phase       | Heading     |
| Special Soil Requirements           | Y/N                | N           |
|                                     | Requirement        |             |
| Chilling Req.                       | Y/N                |             |
|                                     | Amount (hrs)       |             |
| Water Quality                       | Sensitivity (dS/m) | 1.2 (1.9)   |
| First Planting Date                 | (Month)            | March       |
| Last Planting Date                  | (Month)            | May         |
| Consecutive Plantings               | (Y/N)              | Y           |
| First Harvest                       | (Month)            | June        |
| Last Harvest                        | Month)             | Aug         |
| Length of harvest                   | (weeks)            | 12          |
| QMDB                                | Y/N                | Y           |

## Biophysical Requirements and Limiting Factors (climate)

Cauliflower is much more demanding in its environmental requirements than any of the other Brassicas. It is a plant which prefers a cool climate and is grown mostly in cool to cold areas as the quality of the head produced will be reduced by hot weather. A wide range of varieties and maturity times means that production can be year round, particularly in the cooler areas. Production is for both fresh and processing markets.

### Low Temperature

Cauliflowers will tolerate light frosts, though heavy frosts cause leaf burn, stem cracking, stunt plant growth and lead to unmarketable uneven curds.

### High Temperature

Cauliflower is a cool season crop and studies have shown that a 10% potential yield loss will be incurred for every 10 days that the temperature exceeds 30°C during plant growth (Warland et al 2006).

The detrimental effect of days with high temperatures can be attributed to the low optimal temperatures for growth of these “cool season” crops and the physiological problems associated with high temperatures. The optimum average temperature for cauliflower production is 15–20°C. Cauliflower crop quality decreases when temperatures exceed 27°C (Kahn et al 1990).

### Rainfall

Excessive in crop rainfall may favour disease development

### Irrigation

Cauliflowers require regular irrigation to ensure rapid growth and evenness of maturity. Soil type and weather will also influence requirements.

### Soils

The ideal soils for cauliflower production are loams, clay loams and alluvial soils. Soils should have a high organic matter content, good structure and be well drained.

Cauliflowers do not flourish under strongly acidic conditions. Sandy loams which are well managed are suitable for winter production but will need higher rates of fertiliser and more frequent watering under dry conditions. A slightly acidic soil, with a pH of around 6.5 (in water), is desirable.

### Varieties

A wide range of Cauliflower varieties is available and their suitability for a particular area should be discussed with your local seed supplier. Production in hot / humid environments remains a challenge though some tropical type breeding work is underway.

## Markets

Cauliflowers are grown for both the fresh and processing market with specialist growers supplying to the food processing (frozen) market. Recent years has seen a decline in the volume of traditional cauliflower moving through the central marketing system, with more direct supply flowing from contracted producers direct to chain stores.

## Crop Lifecycle

Guide to number of weeks from transplanting to harvest

| Season        | Cabbage           |                | Cauliflower       |                | Broccoli          |                |
|---------------|-------------------|----------------|-------------------|----------------|-------------------|----------------|
|               | Lockyer & coastal | Highland areas | Lockyer & coastal | Highland areas | Lockyer & coastal | Highland areas |
| Autumn/spring | 10 – 12           | 12 – 14        | 10 – 12           | 12 – 14        | 8 – 10            | 10 – 12        |
| Winter        | 13 – 16           | *              | 12 – 14           | *              | 10 – 13           | *              |
| Summer        | *                 | 9 – 11         | *                 | 9 – 11         | *                 | 8 – 9          |

\*not commercially viable at these times of the year

## Comparison Region(s)

Commercial cauliflowers are grown across a large number of regions, soil types and climates in Australia. Temperature (and to some extent seasonal rainfall) is the determining factor in the location and seasonal production of cauliflower in Australia.

In Queensland, summer production occurs on the Darling Downs and in the cooler highland areas of the Granite Belt. Winter production occurs mainly in the Lockyer Valley. Excessive heat or extreme cold conditions severely impact marketable yield.

## Prime Growing Areas



## Main planting and harvesting times in the major production districts

| District  | Crop        | Plant                     | Harvest                      |
|---|-------------|---------------------------|------------------------------|
| Lockyer and Fassifern Valleys and Eastern Darling Downs | Cabbage     | Mid February to August    | Late April to early November |
|   | Cauliflower | Mid February to July      | Late April to September      |
| Highland regions  | Broccoli    | Mid February to August    | Mid April to mid October     |
|   | Cabbage     | Mid August to February    | Mid November to May          |
|   | Cauliflower | September to February     | December to May              |
| Southern coastal areas                                  | Broccoli    | Mid August to early March | November to May              |
|   | Cabbage     | February to mid August    | Mid April to September       |
|   | Cauliflower | Mid March to June         | May to mid September         |
|   | Broccoli    | February to mid August    | April to early October       |

Source: Agrilink - Brassica Growers Handbook (2004).

## Cauliflower in the QMDB Region.

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

## References

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- B. Kahn et al., Cole Crop Production (Broccoli, Cabbage, and Cauliflower) Cooperative Extension Service, Oklahoma State University( HLA-6027 1990)

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.