



Evaluation of cauliflower and broccoli varieties

Spring Harvest
(July - November 2007)



Manjimup Horticultural Research Institute
Department of Agriculture & Food
Western Australia
Compiled by Kristen Stirling

Introduction

This report is the final in a series of four produced from the evaluation of cauliflower and broccoli varieties conducted at the Manjimup Horticultural Research Institute during 2006 and 2007. The results are provided to allow seed suppliers, seedling nurseries, producers, packers and marketers to identify the best variety for a particular harvest period. All varieties receive exactly the same treatment throughout their growth. This has allowed the identification of agronomic requirements that may be specific to some varieties. Varieties that have specific agronomic requirements may perform better when the growing inputs are exactly tailored to suit these varieties. Contact details for participating seed companies are available in Appendix 2.

Trial Details

Transplanting and Harvesting Dates

Table 1: Transplant and harvest dates for cauliflower and broccoli.

	Transplanting Dates	First Harvest Date	Last Harvest Date
Cauliflower	5 July 2007	18 October 2007	12 November 2007
Broccoli	5 July 2007	4 October 2007	22 October 2007

Note: Not all varieties were harvested on every date. These days represent the total harvest days across all varieties.

Transplanting

Cauliflower seedlings were transplanted into a two row per 1.7m bed configuration at a within row spacing of 40cm and a between row spacing of 80cm (29,412 plants per hectare). Broccoli seedlings were transplanted into a three row per 1.7m bed configuration at a within row spacing of 45cm and a between row spacing of 45cm (39,216 plants per hectare). All varieties were grown in 5.1m x 6m plots and were surrounded by a buffer variety. At harvest, 5m of the four inner rows of each cauliflower plot and 3m of the seven inner rows of each broccoli plot were picked, which provided approximately 100 plants for assessment (50 per replicate).

Insect, Disease and Weed Control

A monitoring program for insects and disease was conducted throughout the life of the crop and were controlled as required. Weeds were controlled prior to transplanting and post transplanting.

Weather Conditions

Weather conditions were monitored daily throughout the life of the crop. Details of the weather can be found in Appendix 1. Average maximum daily temperatures were 14.3°C in July, 14.2°C in August, 15.1°C in September, 17.2°C in October and 22.7°C in November. Crops were irrigated with over-head sprinklers. Irrigation was scheduled according to 100% evaporation replacement.

Soil Characteristics

The Manjimup Horticultural Research Institute (south western region of Western Australia) is located on red earth soils which consist of a sandy loam surface changing gradually to a red clay subsoil. They are generally porous and well drained with ironstone nodules often present. These soils have a high water holding capacity but are highly weathered and usually deficient in P, N, Zn, Mo and occasionally Cu. High levels of aluminium and iron oxides and a neutral to acid soil pH results in phosphorus being easily fixed in this soil.

Fertiliser Applications

Fertiliser was applied both at transplanting and post transplanting. Details of fertiliser application are given below. All varieties received the same fertiliser program. All post-transplant applications were foliar applied to plants whilst under irrigation to prevent fertiliser burn. **Summit Spud® analysis:** 6.9% N, 10.2% P, 10.2% K, 8.0% S, 0.15% Cu, 0.16% Zn, 0.9mg Mo, 0.15% Mn, 1.8% Ca. **All Phos® analysis:** 20.5% P, 1.0% S, 15.0% Ca. **Nitro Gold® analysis:** 26% N, 14% S. **Phostrac® analysis:** 15%P, 13% Ca.

Table 2: Fertiliser application for all varieties.

Date	Product	Rate of Application	Method of Application
05 July 2007	Summit Spud®	1500 kg/ha	Incorporated at planting
05 July 2007	All Phos®	150 kg/ha	Incorporated at planting
11 July 2007	Potassium sulphate	100 kg/ha	Foliar application
12 July 2007	Nitro Gold®	88 kg/ha	Foliar application
17 July 2007	Nitro Gold®	88 kg/ha	Foliar application
21 July 2007	Soluble boron	10 kg/ha	Foliar application
18 July 2007	Sodium molybdate	1 kg/ha	Foliar application
18 July 2007	Zinc sulphate	14 kg/ha	Foliar application
25 July 2007	Calcium chelate	1 kg/ha	Foliar application
30 July 2007	Nitro Gold®	88 kg/ha	Foliar application
01 August 2007	Soluble boron	10 kg/ha	Foliar application
01 August 2007	Zinc sulphate	14 kg/ha	Foliar application
03 August 2007	Nitro Gold®	88 kg/ha	Foliar application
09 August 2007	Nitro Gold®	88 kg/ha	Foliar application
17 August 2007	Nitro Gold®	88 kg/ha	Foliar application
22 August 2007	Potassium sulphate	100 kg/ha	Foliar application
31 August 2007	Calcium nitrate	100 kg/ha	Foliar application
04 September 2007	Calcium nitrate	100 kg/ha	Foliar application
13 September 2007	Calcium nitrate	70 kg/ha	Foliar application
26 September 2007	Potassium nitrate	50 kg/ha	Foliar application (cauliflower only)
05 October 2007	Ammonium nitrate	50 kg/ha	Foliar application (cauliflower only)
06 October 2007	Phostrac®	10 l/ha	Foliar application (cauliflower only)
12 October 2007	Ammonium nitrate	50 kg/ha	Foliar application (cauliflower only)

Prior to harvest

A visual assessment of vegetative vigour and plant frame was conducted at approximately ten weeks after transplanting. Varieties were given a vigour rating from one to five relative to the vigour of the control variety. Observations on plant frame size and the wrapping ability of the plant (ability of inner heart leaves to self-cover the developing curd) were recorded.

Covering

Curds were manually covered by bending the outer leaves surrounding the curd to form a protective barrier from the sun. This operation was conducted as required to prevent curd discolouration. The number of covers required by each variety in addition to curds covered at harvest was recorded. Curds were covered whenever the curd was visible through the frame or if there was a risk that the curd may have become visible before harvest.

Harvesting

All leaves were removed from around the cauliflower curd and broccoli head during the harvesting procedure so that an accurate estimation of yield (t/ha) could be made. Harvesting occurred every three to four days as required. Harvesting was delayed as long as possible, up to when curd/head quality would decrease if delayed longer. Broccoli was cut so the stem was about the same length as the diameter of the heads, giving an evenly proportioned head width and stem length.

Grading

The cauliflower and broccoli were graded to allow a comparison of their yield and quality to be made. All curds and heads were assessed for total and marketable yield and quality. Marketable yield was determined by the weight of the curd or head, a quality grade score and the density of the curd or head. Colour of the curd and head was also taken into account. A marketable cauliflower curd/broccoli head was considered to be of a high standard of quality (with no visible defects or markings).

An acceptable weight for cauliflower was a curd between 0.5 and 2 kg. The curd should be a round, domed shape and creamy white to white in colour. The quality score must be five or greater and the density score two or greater. An acceptable size for broccoli heads was between 5 and 20 cm in diameter or between 200 and 800 g in weight. The head should be a green colour with no purple tinges. The quality score for broccoli must be five or greater and density score two or greater.

Density scores were allocated according to the following table. The quality scores are not presented in the results as they are used only to separate poor quality curds or heads in the grading data sheets from those that are of a high standard of quality. Varieties that had a large proportion of high quality curds/heads have had this noted in the results section.

Table 3: Density scoring system for cauliflower and broccoli.

Broccoli	Cauliflower
1 = Very open head	1 = Very open curd
2 = Reasonable density (head is closed and floret stems in middle of the head cannot be easily seen)	2 = Reasonable density (florets closed but not very close to stem underneath)
3 = Very tight head (no floret stems in the middle of the head can be seen)	3 = Very tight closed curd (florets curved underneath close to stem)

The number of cauliflower curds/broccoli heads that were considered to meet domestic market specifications was recorded and the percentage of heads from each variety that could be sold on the domestic market calculated.

Storage of Product

Immediately after picking and grading cauliflower curds of a high quality standard were pre cooled to 1°C by forced air cooling, individually wrapped in paper and placed in a cardboard box which was stored at a room temperature of 1°C for 14 days. Broccoli heads of a high quality standard were pre cooled to 1°C by forced air cooling, packed into polystyrene

cartons filled with ice and then placed in cool store at 1°C for 21 days. After storage, the curds and heads were removed and re-graded for after-storage quality.

Results

The varieties were assessed prior to harvest, at harvest and post storage. The vigour of varieties was assessed relative to the control variety prior to harvest, at harvest and post storage.

Table 4: Pre-harvest characteristics of cauliflower and broccoli.

Cauliflower variety	Vigour * (1 – 5)	No. of covers required before harvest [^]	Comments [@]
CH 0438	5	0	Upright medium sized plant frame.
CLF 4726	5	0	Upright medium sized plant frame.
CLX 33216 (Sloop)	5	0	Medium sized plant frame. Good self - wrapping ability.
Eskimo	5	0	Upright large sized plant frame.
Hyperno	5	1	Upright plant frame. Average self - wrapping ability. Open plant frame at base of curd.
Nova	5	1	Medium sized plant frame.
CF 574	4	0	Small to medium sized plant frame.
Vega	5	0	Upright large sized plant frame.
Virgin - control	5	0	Upright large sized plant frame. Good self-wrapping ability.

Broccoli variety	Vigour * (1 – 5)	No. of covers required before harvest [^]	Comments
BRC 6311	5	na	Large plant frame. Coarse beading
BRC 7680	5	na	Medium to large plant frame. Fine beading
Bridge	4	na	Small plant frame with broccoli head low to ground.
Brumby	5	na	Tall upright plant frame.
Ironman - control	5	na	Medium sized plant frame. Fine beading.

* 1 = low vigour (less growth) 5 = high vigour (greatest growth)

[^] The number of covers prior to harvest indicates those varieties that require covering in addition to the covering procedure carried out during harvest.

[@] Wrapping ability refers to the ability of inner heart leaves to self-cover the developing curd from exposure to the sun.

Table 5: Maturity times, spread of harvest and total and marketable yield of cauliflower and broccoli at harvest.

Cauliflower variety	Days from transplant to first harvest[^]	Number of picks required (total yield)	Total Yield (t/ha)*	Marketable Yield (t/ha)[#]	Number of marketable curds per hectare[@]
CH 0438	105	5	24.6	24.0	28, 529
CLF 4726	112	4	27.8	26.9	29, 412
CLX 33216 (Sloop)	105	5	24.8	23.7	28, 824
Eskimo	109	6	25.1	23.5	28, 529
Hyperno	109	3	19.7	15.2	22, 941
Nova	105	4	22.8	21.5	28, 529
CF 574	123	3	22.0	20.8	29, 412
Vega	116	3	25.7	25.2	28, 824
Virgin - control	109	5	30.4	29.3	29, 118

Broccoli Variety	Days from transplant to first harvest[^]	Number of picks required (total yield)	Total Yield (t/ha)*	Marketable Yield (t/ha)[#]	Number of marketable heads per hectare[@]
BRC 6311	91	1	14.2	11.1	34, 271
BRC 7680	91	1	8.9	6.3	37, 028
Bridge	95	2	8.7	6.3	38, 910
Brumby	98	4	11.1	8.9	38, 910
Ironman - control	91	3	10.0	9.1	38, 910

[^] Days from transplant to first harvest have been averaged for the two replicates of each variety.

* Yields may be greater in trials than commercial practice due to all curds being picked. Curds that mature early or late compared to the main harvest period may not be included in commercial yield estimates.

[#] Yield when curds/heads not suitable for market are removed.

[@] Number of heads suitable for domestic market sale out of an original 29,412 plants per hectare planting density for cauliflower and 39,216 plants per hectare planting density for broccoli

Table 6: Characteristics of cauliflower and broccoli at harvest.

Cauliflower variety	Average marketable curd weight (g)	Average marketable curd diameter (cm)	Density[^]	Colour[*]
CH 0438	860.5	15.6	2.8	Creamy white
CLF 4726	952.1	15.5	3.0	Creamy white
CLX 33216 (Sloop)	874.4	15.5	2.9	Creamy white
Eskimo	877.7	15.3	2.9	Creamy white
Hyperno	717.2	15.5	1.9	Creamy white
Nova	802.4	14.8	2.9	Creamy white
CF 574	796.2	14.5	3.0	Creamy white
Vega	894.2	15.1	3.0	Creamy white
Virgin - control	1050.0	16.2	3.0	White

Broccoli variety	Average marketable head weight (g)	Average marketable head diameter (cm)	Density[^]	Colour
BRC 6311	338.2	13.5	2.2	Green
BRC 7680	248.7	12.6	2.1	Green
Bridge	230.0	11.3	2.9	Green
Brumby	308.0	12.9	2.6	Green
Ironman - control	246.4	11.9	2.4	Green

[^] Average density of total yield.

^{*} Off white describes a curd that has a slightly creamy colour although it is predominately white.

Table 7: Percentage (%) of total yield picked at each harvest*.

Cauliflower variety	18 Oct (105)	22 Oct (109)	25 Oct (112)	29 Oct (116)	01 Nov (119)	05 Nov (123)	08 Nov (126)	12 Nov (130)	Total
CH 0438	1		16	65	6	12			100
CLF 4726			5	40	25	30			100
CLX 33216 (Sloop)	4	3	31	55	7				100
Eskimo		3	5	26	18	36	12		100
Hyperno		26	45	29					100
Nova	10	20	42	28					100
CF 574						24	42	34	100
Vega				28	26	46			100
Virgin - control		5	19	45	19	12			100

Broccoli variety	04 Oct (91)	08 Oct (95)	11 Oct (98)	15 Oct (102)	18 Oct (105)	22 Oct (109)	Total
BRC 6311	100						100
BRC 7680	100						100
Bridge		52	48				100
Brumby			13	25	9	53	100
Ironman - control	5	57	38				100

* The percentage of yield picked at each harvest has been averaged for the two replicates of each variety.

() Figure in brackets represents the number of days from transplanting to first harvest.

Table 8: Cauliflower curd and broccoli head comments

Cauliflower variety	Comments (Harvest)	Comments (Post-storage)*
CH 0438	Good harvest quality. Minor reduction in marketable yield due to curd yellowing.	Excellent post storage quality.
CLF 4726	Very good harvest quality. Reduction in marketable yield due to minor amount of split and yellow curds.	Very good post storage quality. Minor amount of cell collapse.
CLX 33216 (Sloop)	Good harvest quality. Minor reduction in marketable yield due to the presence of split and yellow curds.	Excellent post storage quality.
Eskimo	Very good harvest quality. Reduction in marketable yield due to minor amount of split curds.	Good post storage quality. Minor loss of curd firmness.
Hyperno	Reasonable harvest quality. Marketable yield reduced by presence of low density curds and yellowing.	Substantial reduction of post storage quality due to loss of curd firmness.
Nova	Good harvest quality. Minor reduction in marketable yield due to curd yellowing and the presence of smaller curds.	Good post storage quality. Minor loss of curd firmness.
CF 574	Good harvest quality with dense curds. Minor reduction in marketable yield due to curd yellowing.	Good post storage quality. Minor amount of cell collapse.
Vega	Very good harvest quality. Reduction in marketable yield due to minor amount of split and yellow curds.	Excellent post storage quality.
Virgin - control	Excellent harvest quality. Reduction in marketable yield due to minor amount of split and yellow curds.	Very good post storage quality. Minor loss of curd firmness.

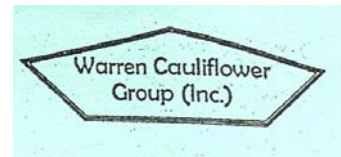
Broccoli variety	Comments (Harvest)	Comments (Post-storage)*
BRC 6311	Reasonable harvest quality. Marketable yield reduced by coarse beading ('cats eyes'), purpling and an uneven dome shape.	Minor reduction in post storage quality due to loss of head firmness and browning of florets.
BRC 7680	Good harvest quality. Marketable yield reduced by presence of smaller heads.	Minor reduction in post storage quality due to loss of head firmness and browning of florets.
Bridge	Good harvest quality. Marketable yield reduced by presence of smaller heads and purpling.	Very good post storage quality.
Brumby	Good harvest quality. Marketable yield reduced by presence of smaller heads.	Excellent post storage quality.
Ironman - control	Very good harvest quality. Reduction in marketable yield due to minor amount of purpling and presence of smaller heads.	Excellent post storage quality.

* Collapse is the breakdown of individual 'flowers' within a floret. Discolouration of the affected 'flowers' has not yet occurred. Deterioration is the next stage from cell collapse, when the individual 'flowers' have started to turn brown or black.

Acknowledgements

The variety trials have been supported by many organisations. These organisations have either provided financial or in-kind support.

- *Department of Agriculture and Food, Western Australia*
- *Lefroy Valley Seeds*
- *Clause Henderson*
- *South Pacific Seeds*
- *Springall Nursery*
- *Syngenta*
- *Terranova Seeds*
- *Warren Cauliflower Group (Inc)*



Clause Henderson Team

Appendix 1

Weather records at Manjimup Horticultural Research Institute (July – November 2007)

Monthly weather summary – July 2007

Date	Temperature Max	Temperature Min	Evaporation mm	Rain mm	Comment
1-Jul-07	14.1	8.7	1.5	1.8	Gales, cool
2-Jul-07	16.0	7.9	0.8	25.4	Heavy showers, mild
3-Jul-07	11.5	5.7	0.2	24.4	Isolated showers, cold
4-Jul-07	12.2	9.1	1.5	2.8	Isolated showers, cool
5-Jul-07	15.0	9.0	1.3	0.8	Drizzle, mild
6-Jul-07	14.2	8.5	1.0	0.4	Patchy drizzle, mild
7-Jul-07	14.9	8.0	0.9	0.2	Mainly fine, mild
8-Jul-07	18.1	12.3	1.9	5.8	Isolated showers, mild
9-Jul-07	16.6	4.4	1.2	1.2	Isolated showers, mild
10-Jul-07	11.9	3.4	1.0	1.6	Frost, fine, cold
11-Jul-07	13.4	4.6	1.9	0.0	Scattered frosts ,fine, cool
12-Jul-07	14.0	9.3	1.7	0.2	Fine, overcast, mild
13-Jul-07	15.1	8.3	1.0	0.0	Morning fog, fine, mild
14-Jul-07	16.8	9.8	1.3	0.2	Fine, mild
15-Jul-07	16.0	6.3	1.6	0.0	Fine, mild
16-Jul-07	13.2	7.3	0.7	0.0	Showers, cool
17-Jul-07	14.9	6.4	1.1	2.6	Fine, mild
18-Jul-07	14.3	6.9	1.4	0.0	Fine, mild
19-Jul-07	18.0	11.1	2.6	0.4	Fine, late showers
20-Jul-07	12.3	9.8	0.2	13.8	Fine, cloudy, late showers
21-Jul-07	15.1	9.5	2.0	0.0	Showers, mild
22-Jul-07	11.5	7.2	0.5	22.0	Fine, evening showers
23-Jul-07	12.7	7.8	1.2	4.8	Showers, cool
24-Jul-07	13.7	7.4	1.1	20.8	Showers, cool
25-Jul-07	11.3	7.3	1.5	7.0	Overcast, cold
26-Jul-07	12.9	4.6	1.8	0.2	Overcast, evening showers cool
27-Jul-07	13.0	9.2	1.5	1.8	Overcast, evening showers, cool
28-Jul-07	15.8	8.8	1.0	14.2	Showers, mild
29-Jul-07	13.8	11.6	1.6	2.6	Windy, showers
30-Jul-07	16.5	13.0	1.8	10.2	Rain, mild
31-Jul-07	13.0	7.4	0.3	19.8	Showers, mild

Monthly weather summary – August 2007

Date	Temperature		Evaporation mm	Rain mm	Comment
	Max	Min			
1-Aug-07	12.8	8.0	1.6	8.4	Showers, cool
2-Aug-07	11.7	5.5	0.9	11.4	Light showers, cold
3-Aug-07	12.3	5.5	1.2	3.2	Fine, cool
4-Aug-07	12.8	7.9	1.0	0.0	Fine, cool
5-Aug-07	15.7	9.3	2.4	0.0	Overcast, late showers, mild
6-Aug-07	17.1	9.0	1.7	17.8	Heavy showers, hail, mild
7-Aug-07	10.7	6.0	0.8	8.4	Drizzle, cold
8-Aug-07	13.8	10.3	1.6	0.2	Cloudy, cool
9-Aug-07	15.0	10.8	2.2	0.2	Cloudy, mild, overnight rain
10-Aug-07	16.5	9.2	1.8	12.0	AM rain, overcast, mild
11-Aug-07	11.0	3.9	0.4	6.0	Cloudy, cold
12-Aug-07	12.4	3.6	1.3	4.0	Fine, cool
13-Aug-07	13.5	4.6	2.2	0.0	AM frost, cloudy, overnight showers
14-Aug-07	14.0	5.7	1.5	10.8	Showers overnight, drizzle, mild
15-Aug-07	11.6	8.2	1.3	11.6	Drizzle, cold
16-Aug-07	14.8	8.2	1.9	2.4	Cloudy, mild
17-Aug-07	14.2	8.6	1.5	0.2	Cloudy, mild
18-Aug-07	14.3	7.0	2.5	0.0	Cloudy, mild
19-Aug-07	19.7	11.0	3.3	0.0	Heavy showers, mild
20-Aug-07	18.2	9.0	0.5	23.6	Cloudy, mild
21-Aug-07	15.6	10.4	1.1	0.2	AM fog, cloudy, mild
22-Aug-07	17.9	11.7	2.1	0.0	Rain developing, mild
23-Aug-07	14.4	8.5	0.4	7.4	Cloudy, mild
24-Aug-07	14.0	9.8	3.0	0.0	Cloudy, windy, mild
25-Aug-07	17.0	10.0	2.5	5.4	Windy, showers, mild
26-Aug-07	16.2	8.6	2.2	8.6	Gales, mild
27-Aug-07	13.4	8.1	1.8	8.8	Showers, cool
28-Aug-07	13.8	9.7	2.0	0.6	Showers, cool
29-Aug-07	15.7	11.4	1.4	6.8	Rain, mild
30-Aug-07	11.5	4.0	0.5	21.0	Cloudy, cold
31-Aug-07	8.0	12.6	2.3	0.0	Cloudy, cold

Monthly weather summary – September 2007

Date	Temperature		Evaporation mm	Rain mm	Comment
	Max	Min			
1-Sep-07	13.4	7.9	1.6	0.6	na
2-Sep-07	15.3	7.6	2.0	1.4	na
3-Sep-07	15.8	5.4	3.0	0.2	na
4-Sep-07	21.0	11.7	4.0	1.2	na
5-Sep-07	13.4	6.5	1.4	9.4	na
6-Sep-07	13.2	6.8	2.3	0.4	na
7-Sep-07	15.1	8.1	1.7	0.0	na
8-Sep-07	12.5	6.3	1.0	23	na
9-Sep-07	15.1	8.5	2.6	1.0	na
10-Sep-07	14.0	5.2	2.1	0.0	na
11-Sep-07	16.5	8.3	2.6	5.0	na
12-Sep-07	17.4	8.4	2.8	3.2	na
13-Sep-07	12.0	7.1	1.1	26.2	na
14-Sep-07	14.1	8.9	2.2	0.2	na
15-Sep-07	11.2	5.3	0.9	17.0	na
16-Sep-07	13.9	7.8	1.8	5.6	na
17-Sep-07	17.3	11.4	2.7	1.8	na
18-Sep-07	15.3	8.9	2.9	4.2	na
19-Sep-07	14.0	4.8	2.1	4.8	na
20-Sep-07	15.8	9.9	2.9	0.6	na
21-Sep-07	16.3	9.7	2.3	1.2	na
22-Sep-07	17.2	8.6	2.3	7.4	na
23-Sep-07	14.5	5.4	3.8	0.2	na
24-Sep-07	15.9	9.2	2.7	29.6	na
25-Sep-07	10.9	3.1	1.5	11.4	na
26-Sep-07	13.3	10.3	2.3	2.6	na
27-Sep-07	16.7	10.7	2.8	5.2	na
28-Sep-07	14.9	10.7	1.7	6.4	na
29-Sep-07	17.7	11.9	2.7	0.2	na
30-Sep-07	18.0	11.5	3.5	0.4	na

Monthly weather summary – October 2007

Date	Temperature		Evaporation mm	Rain mm	Comment
	Max	Min			
1-Oct-07	18.3	6.9	4.4	0.0	na
2-Oct-07	17.6	10.4	4.1	1.6	na
3-Oct-07	15.0	7.2	3.6	0.0	na
4-Oct-07	19.5	7.0	4.6	0.0	na
5-Oct-07	17.7	7.6	3.4	0.0	na
6-Oct-07	19.1	8.8	4.1	0.0	na
7-Oct-07	14.9	6.7	2.1	0.0	na
8-Oct-07	15.4	10.7	1.6	0.0	na
9-Oct-07	16.8	10.8	1.3	7.6	na
10-Oct-07	14.0	7.7	2.6	1.8	na
11-Oct-07	13.8	5.8	2.1	1.8	na
12-Oct-07	16.1	6.8	3.2	0.0	na
13-Oct-07	18.7	8.1	4.2	0.0	na
14-Oct-07	24.7	9.4	5.8	0.0	na
15-Oct-07	20.8	6.7	4.8	1.0	na
16-Oct-07	18.8	8.0	5.3	0.0	na
17-Oct-07	22.9	9.4	5.5	0.0	na
18-Oct-07	16.3	5.3	2.1	10.6	na
19-Oct-07	16.9	6.4	3.6	0.0	na
20-Oct-07	19.9	9.0	3.4	2.2	na
21-Oct-07	13.5	8.1	2.6	6.6	na
22-Oct-07	12.0	7.6	2.3	6.2	na
23-Oct-07	17.4	7.7	5.5	0.0	na
24-Oct-07	19.7	7.1	6.0	0.0	na
25-Oct-07	24.3	8.9	6.7	0.0	na
26-Oct-07	25.7	11.0	5.0	1.4	na
27-Oct-07	14.2	3.6	2.4	25.4	na
28-Oct-07	9.4	5.3	2.8	12.2	na
29-Oct-07	12.4	7.2	2.9	2.0	na
30-Oct-07	13.4	6.9	2.2	0.8	na
31-Oct-07	14.1	6.9	3.3	1.4	na

Monthly weather summary – November 2007

Date	Temperature		Evaporation mm	Rain mm	Comment
	Max	Min			
1-Nov-07	17.1	7.3	5.0	0.2	na
2-Nov-07	15.7	5.4	3.4	0.0	na
3-Nov-07	15.7	4.5	5.1	0.0	na
4-Nov-07	17.0	7.5	6.6	0.0	na
5-Nov-07	23.6	10.1	7.5	0.0	na
6-Nov-07	27.2	13.2	6.4	0.0	na
7-Nov-07	20.7	10.0	5.4	0.0	na
8-Nov-07	22.2	10.7	5.9	0.0	na
9-Nov-07	19.9	8.6	4.1	0.0	na
10-Nov-07	19.8	7.9	4.7	0.4	na
11-Nov-07	22.6	9.2	6.5	0.0	na
12-Nov-07	28.2	12.9	7.9	0.0	na
13-Nov-07	34.6	13.5	6.7	0.0	na
14-Nov-07	17.5	11.6	1.3	0.0	na
15-Nov-07	26.1	9.7	6.1	0.0	na
16-Nov-07	23.1	9.9	6.3	0.0	na
17-Nov-07	22.8	10.4	6.7	0.0	na
18-Nov-07	23.2	8.8	6.5	1.6	na
19-Nov-07	17.6	11.0	5.5	0.0	na
20-Nov-07	14.6	5.6	4.0	3.6	na
21-Nov-07	18.4	7.4	6.2	0.2	na
22-Nov-07	25.0	8.5	7.6	0.0	na
23-Nov-07	30.0	11.0	8.2	0.0	na
24-Nov-07	30.4	10.9	7.6	0.0	na
25-Nov-07	29.9	13.0	6.9	0.0	na
26-Nov-07	23.0	12.5	4.8	0.0	na
27-Nov-07	21.3	8.5	5.7	0.0	na
28-Nov-07	23.3	10.0	7.0	0.0	na
29-Nov-07	29.3	14.2	7.2	0.0	na
30-Nov-07	22.3	10.8	5.9	1.4	na

Appendix 2

Seed company details (Western Australia):

Cauliflower Variety	Seed Company	Contact Person	Mobile Number
CH 0438	Clause Henderson	Graham Adams	0400 622 314
CLF 4726	Lefroy Valley	Alek Moreno	0418 914 714
CLX 33216 (Sloop)	Clause Henderson	Graham Adams	0400 622 314
Eskimo	Lefroy Valley	Alek Moreno	0418 914 714
Hyperno	South Pacific Seeds	Adam Curtayne	0419 934 767
Nova	Terranova	Jamie Hagart	0417 930 233
CF 574	Syngenta Seeds	Kevin Gugiatti	0408 499 990
Vega	Terranova	Jamie Hagart	0417 930 233
Virgin - control			

Broccoli Variety	Seed Company	Contact Person	Mobile Number
BRC 6311	Lefroy Valley	Alek Moreno	0418 914 714
BRC 7680	Lefroy Valley	Alek Moreno	0418 914 714
Bridge	South Pacific Seeds	Adam Curtayne	0419 934 767
Brumby	South Pacific Seeds	Adam Curtayne	0419 934 767
Ironman - control			

Important Disclaimer

The Chief Executive Officer of the Department of Agriculture and Food and the State of Western Australia accept no liability whatsoever by reason of negligence or otherwise arising from the use or release of this information or any part of it.

This document has been prepared from a cauliflower and broccoli variety evaluation trial conducted at the Manjimup Horticultural Research Institute, South Western Highway, Manjimup WA 6258. The results reflect the growth characteristics, yield, quality and density of the cauliflower and broccoli varieties as recorded at this site during the conditions of the growing period (July to November 2007).

Variations in the characteristics of the cauliflower and broccoli varieties may occur during other growth period, locations and management programs. The availability of the document does not imply suitability to other areas, growth periods or management programs and any interpretation is the responsibility of the user.