

# **Integrated weed management in vegetable brassicas**

Les Mitchell  
Agrisearch Services Pty Ltd

Project Number: VG09137

## **VG09137**

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**(30 June 2011)**

**INTEGRATED WEED MANAGEMENT  
IN VEGETABLE BRASSICAS**

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This final report provides details of the studies undertaken to develop integrated management strategies for weed control in vegetable brassicas.

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*Please consult the APVMA website (<http://www.apvma.gov.au/>) for the most up to date information regarding the registration or minor use access status of any of the chemicals discussed within this report.*



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30 June 2011

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## **1. MEDIA SUMMARY**

The brassica industry has developed an integrated approach to weed control with cultural and herbicide methods used to keep weed populations at low levels such that economic crops can be grown. However there are no herbicides registered for post-emergence broadleaf weed control in brassica crops, other than at very early post-transplanting.

This project aimed at evaluating possible alternatives for later post-emergence weed control in cauliflower, broccoli and Brussels sprouts.

A range of herbicides and herbicide application programs were evaluated at eight locations in the major brassica growing areas of Australia.

The program confirmed that the application of BARON WP (oxyfluorfen) herbicide as a broadcast treatment to be a very effective tool when applied within 3 days following transplanting as per the label recommendations in a program with a suitable pre-emergence herbicide such as DUAL GOLD (S-metolachlor).

Investigation of the benefits of applying BARON WP at 3-4 weeks following transplanting demonstrated no difference over and above applying BARON WP immediately following transplanting, when applied accurately.

The need to control broadleaf weeds which 'escape' early weed control strategies was further addressed through the use of the non-selective knockdown herbicides glufosinate-ammonium (BASTA), carfentrazone-ethyl (SPOTLIGHT PLUS) and paraquat (GRAMOXONE 250) as well as BARON WP through shrouded sprayers. BARON WP applied through a shrouded sprayer as an alternative to applying the treatment 'over the top' would be effective.

However, the major concern is with spray drift escaping from the unit and causing damage to the off-target crop. A level of crop phytotoxicity was seen in all trials, and was particularly severe at some locations. A level of precision is required when applying treatments in this fashion which may be beyond the capability of currently available shrouded spraying equipment. The use of non-selective herbicides through this method of application however will offer growers a practical alternative to cultivation later in the crop cycle but effective shrouded sprayers for vegetable brassicas need to be developed.

The use of BASTA (glufosinate-ammonium) applied via shrouded sprayers gave effective weed control and will offer an alternative to residual herbicides or cultivation. The further development of this form of weed control is recommended.

GRAMOXONE 250 currently has a registration for use via shielded equipment in vegetables and could be used as a salvage treatment where equipment is available.

SPOTLIGHT PLUS (carfentrazone-ethyl) is not recommended for further development via this application technique.

## 2. TECHNICAL SUMMARY

The brassica industry has developed an integrated approach to weed control with cultural and herbicide methods used to keep weed populations at low levels such that economic crops can be grown. However there are no herbicides registered for post-emergence broadleaf weed control in brassica crops, other than at very early post-transplanting.

This project aimed at evaluating herbicide options for later post-emergence weed control, or strategies using currently registered herbicides to provide effective weed control in Brussels sprouts, cauliflower and broccoli.

Eight small plot replicated field trials were conducted in the major brassica growing regions of Australia to evaluate the currently registered herbicide BARON WP (oxyfluorfen) when applied at crops stages later than are currently registered, when applied in a program with currently registered pre-emergence herbicides, and when applied as a banded in-row treatment using shrouded spray equipment. In addition the pre-emergence herbicide FRONTIER-P (dimethenamid-P) was included at a number of locations as an alternative to currently registered actives.

A further four small plot replicated field trials were conducted to evaluate the non-selective knockdown herbicides BASTA (glufosinate-ammonium), GRAMOXONE 250 (paraquat) and SPOTLIGHT PLUS (carfentrazone-ethyl) when applied alone or in combination with BARON WP (oxyfluorfen) through shrouded spray equipment for later post-emergent weed control.

A fully compliant GLP residue program was also conducted with the active ingredients used in this part of the program to generate crop residue data, when each of these active was applied at these timing via shrouded equipment.

Efficacy trials were conducted as small plot replicated experiments with 3 or 4 replicates. Treatments were applied at the appropriate timings using hand held gas operated boom sprayers as broadcast or directed (shroud) spray treatments. Application volumes were used which replicated industry standards. Assessments for post-application weed control and crop safety were conducted at each location and crop yield measured at two sites.

In these studies over 22 different broadleaf weeds were present with *Stellaria media*, *Sonchus oleraceus*, *Chenopodium album* and *Malva parviflora* being the most ubiquitous.

The application of BARON WP herbicide as a broadcast treatment was shown to be a very effective tool when applied as a broadcast spray within 3 days following transplanting as per the label recommendations in a program with a suitable pre-emergence herbicide such as DUAL GOLD (S-metolachlor).

Investigation of the benefits of applying BARON WP at 3-4 weeks following transplanting demonstrated no difference over and above applying BARON WP immediately following transplanting. Whilst the treatments were generally considered safe, at some locations a significant reduction in crop biomass compared to untreated plots was seen. The use of the BARON WP alone to achieve later post-emergence weed control cannot be supported.

The herbicide FRONTIER-P (dimethenamid-P) was also evaluated as an alternative to the currently used pre-emergence herbicides. Whilst effective weed control was achieved, data indicated that performance was generally less than the current standards where applied alone or in a program with BARON WP. In addition some crop safety issues were identified with FRONTIER-P generally showing a lower level of selectivity than the current standards and as such cannot be recommended for further development.

The need to control broadleaf weeds which 'escape' early weed control strategies was further addressed through the use of the non-selective knockdown herbicides BASTA (glufosinate-ammonium), SPOTLIGHT PLUS (carfentrazone-ethyl) and GRAMOXONE 250 (paraquat) as well as BARON WP through shrouded sprayers. BARON WP applied through a shrouded sprayer as an alternative to applying the treatment 'over the top' would be effective. Application rates of 150-500 g/ha were safe but generally were no better than when BARON WP was applied at transplanting.

The use of BASTA (glufosinate-ammonium) applied via shrouded sprayers gave effective weed control and will offer an alternative to residual herbicides or cultivation. The further development of this form of weed control is recommended.

The major concern however is with spray drift escaping from the unit and causing damage to the off-target crop. A level of crop phytotoxicity was seen in all trials but varied between locations. General damage was greatest at 7 days following application and disappeared over time. When tank-mixed with BARON WP however phytotoxic symptoms were often greater than with each of the knockdown herbicides applied alone. A tank mix of BARON WP plus either BASTA, SPOTLIGHT PLUS or GRAMOXONE 250 cannot be recommended for further development due to the high risk of a significant level of crop damage occurring.

GRAMOXONE 250 currently has a registration for use via shielded equipment in vegetables and could be used as a salvage treatment where equipment is available.

SPOTLIGHT PLUS (carfentrazone-ethyl) is not recommended for further development via this application technique.



### 3. INTRODUCTION

All brassica crops require good weed control, especially during the establishment period, as the seedlings are delicate and uncompetitive with weeds. Weeds compete for space, sunlight, nutrients and water. Weeds in the near vicinity of brassica crops and within paddocks can sometimes harbour pathogens, insects or vertebrates that can invade and spread to the crop soon after planting. As brassica crops develop, especially cauliflower and Brussels sprouts, they have the ability to shade and compete well with weeds; broccoli on the other hand produce little shade.

The brassica industry has developed an integrated approach to weed control with cultural and herbicide methods used to keep weed populations at low levels such that economic crops can be grown. Management of diseases, insects and nematodes also have an effect on the weed control program because damage by pests may limit the crop's overall ability to compete with weeds and sometimes makes the crop more susceptible to herbicides.

According to a report to Horticulture Australia Ltd (Frost et al 2002) the options for weed control in brassica crops is limited. Mechanical methods are the principle means of weed control in Victoria, South Australia and Western Australia. In Queensland, New South Wales and parts of Tasmania (broad-acre systems), herbicides are increasingly being used for weed control.

Mechanical weed control methods employed after planting often cause physical damage. Cultivation can also contaminate crops with soil resulting in the potential spread of *Xanthomonas* (Frost et al 2002) and other diseases.

A thorough investigation of the herbicides employed in the industry and their use patterns was conducted by AgAware consulting in 2007/2008 (VGO6107). The study surveyed registered herbicides at that time and drew the following conclusions;

*“Some pre-emergent herbicides are applied before transplanting or seeding and some are applied immediately after transplanting or seeding. These herbicides require irrigation before application if soils are dry and also require irrigation soon after application to ‘lock’ the herbicide into the top few centimetres of soil so that germinating weed seedlings are killed. There are no herbicides registered for post-emergence broadleaf weed control in brassica crops (Dimsey 1998), other than at very early post-transplanting. LONTREL (clopyralid) has a permit for use in cauliflower for capeweed and clover control for Western Australia only.”*

Little has changed since that time.

The report went on to make the following recommendations as a means of extending the weed controls options available to vegetable brassica growers:

- Investigate the use of BARON WP (oxyfluorfen) applied at low use rates as a post-emergence treatment several weeks after transplanting for broccoli, cauliflower and Brussels sprouts. The use of oxyfluorfen in this manner would lower the costs of weed control to grower as well as reduce the pesticide load currently used.
- The possible use of the knockdown herbicides BASTA (glufosinate-ammonium) or GRAMOXONE 250 (paraquat) in combination with low rates of oxyfluorfen or SPOTLIGHT PLUS (carfentrazone-ethyl) as post-emergence treatments applied by shielded sprayers between rows of brassica crops.
- Conduct research with oxyfluorfen post-emergence and post-transplant plus and minus irrigation to demonstrate to growers the importance of herbicide incorporation for weed control.
- The production of a 'Growers Manual' listing 'best-practice' techniques for using the currently available herbicides.

This project was formulated based upon these recommendations and included the following components:

#### ***Project Component 1 – Herbicide Strategies***

Under this part of the project eight field trials were conducted in each of the major brassica growing areas within Australia to evaluate the use of BARON WP (oxyfluorfen) as an option for later post-emergence weed control when applied as a broadcast spray. In addition the previously identified selective herbicide FRONTIER-P (dimethenamid-P) was included at some sites to evaluate efficacy and selectivity.

#### ***Project Component 2 – Knockdown Shielded Herbicide Program***

The efficacy and safety of several different herbicides when applied through protected spraying equipment was evaluated at five locations. Shrouded booms were constructed to simulate commercial application and the candidates; glufosinate-ammonium, paraquat, carfentrazone-ethyl and oxyfluorfen applied.

A full residue program was also completed including each of the above actives. Eight sites were established and each of the herbicides applied using the shrouded boom equipment at around 5 weeks following transplanting. Crop samples were harvested and analysed for each of the actives evaluated.

A fully compliant GLP residue report has been prepared and has been submitted as an addendum to this report.

### ***Project Component 3 – Irrigation Incorporation Demonstration***

The importance of incorporating the herbicide BARON WP (oxyfluorfen) when applied as an early post-transplant treatment was demonstrated at five locations by maintaining incorporated and non-incorporated herbicide plots.

### ***Project Component 4 – Grower Resource Pack***

A grower resource document was prepared detailing options for integrated weed management in these crops. The brochure is included as an Addendum to this report.

In addition field days were held at each site to demonstrate various herbicide options for weed control as well as stressing the importance of adopting an integrated approach to weed management.

The project was conducted under Horticulture Australia Limited project VG09137 and Agrisearch Project HAL/09/06/a.

## 4. MATERIALS AND METHODS

### 4.1 Project Component 1 – Herbicide Strategies

#### 4.1.1 Site Details

<b>Trial Number</b>	<b>Location</b>	<b>Soil Type</b>	<b>Crop</b>	<b>Variety</b>	<b>Experimenter</b>	<b>Transplant Date</b>
1	Gatton, Qld	Black self mulching clay	Broccoli	Atomic	Richard Holzknacht	10-Feb-10
2	Mangrove Mountain, NSW	Sandy loam	Broccoli	Greenbelt	Peter Melville	27-Apr-10
3	Bathurst, NSW	Granitic sandy clay	Cauliflower	Beluga	Neil Adams	24-Feb-10
4	Coldstream, Vic	Grey clay loam	Brussels sprouts	Oliver	Marco Montagna	1-Feb-10
5	Werribee, Vic	Red clay loam	Cauliflower	Skywalker	Marco Montagna	22-Feb-10
6	Devonport, Tas	Red clay loam	Broccoli	Iron man	Philip Frost (Peracto)	4-Mar-10
7	Nairne, SA	Brown clay loam	Brussels sprouts	Millennium	Bill Frost	20-Jan-10
8	Manjimup, WA	Sandy loam	Cauliflower	Skywalker	Charlie Hewitt	10-Mar-10

#### 4.1.2 Target Weeds

Trial Number	Location	Weeds
1	Gatton, Qld	Black pigweed ( <i>Trianthema portulacastrum</i> ), sowthistle ( <i>Sonchus oleraceus</i> ), dwarf amaranth ( <i>Amaranthus macrocarpus</i> ), barnyard grass ( <i>Echinochloa crus-galli</i> )
2	Mangrove Mountain, NSW	Potato weed ( <i>Galinsoga parviflora</i> ), chickweed ( <i>Stellaria media</i> ), shepherd's purse ( <i>Capsella bursa-pastoris</i> ), marshmallow ( <i>Malva parviflora</i> ), winter grass ( <i>Poa annua</i> )
3	Bathurst, NSW	Saffron thistle ( <i>Carthamus lanatus</i> ), chickweed ( <i>Stellaria media</i> ), pigweed ( <i>Portulaca oleraceus</i> ), deadnettle ( <i>Lamium amplexicaule</i> ), Paterson's curse ( <i>Echium plantagineum</i> ), shepherd's purse ( <i>Capsella bursa-pastoris</i> )
4	Coldstream, Vic	Fat hen ( <i>Chenopodium album</i> ), capeweed ( <i>Arctotheca calendula</i> ), wireweed ( <i>Polygonum aviculare</i> ), marshmallow ( <i>Malva parviflora</i> ), annual ryegrass ( <i>Lolium rigidum</i> )
5	Werribee, Vic	Stinging nettle ( <i>Urtica urens</i> ), shepherd's purse ( <i>Capsella bursa-pastoris</i> ), wireweed ( <i>Polygonum aviculare</i> ), marshmallow ( <i>Malva parviflora</i> ), sowthistle ( <i>Sonchus oleraceus</i> )
6	Devonport, Tas	Fat hen ( <i>Chenopodium album</i> ), blackberry nightshade ( <i>Solanum nigrum</i> ), shepherd's purse ( <i>Capsella bursa-pastoris</i> ), Opium poppy ( <i>Papaver somniferum</i> )
7	Nairne, SA	Fat hen ( <i>Chenopodium album</i> ), wireweed ( <i>Polygonum aviculare</i> ), capeweed ( <i>Arctotheca calendula</i> )
8	Manjimup, WA	Wild radish ( <i>Raphanus raphanistrum</i> ), dock ( <i>Rumex</i> sp), arrow leaf clover ( <i>Trifolium vesiculosum</i> ), fat hen ( <i>Chenopodium album</i> ), annual ryegrass ( <i>Lolium rigidum</i> )

### 4.1.3 Treatments Applied

Treatment	Application Timing	Rate Product/ha	Sites Where Treatments Applied
1. Cultivation	Pre-plant		1,2,3,4,5,6,7,8
2. Cultivation Hand Weeding	Pre-plant Post-plant		1,2,3,4,5,6,7,8
3. Cultivation Pre-em Herbicide* BARON WP Inter-row cultivation	Pre-plant Pre-plant/or 0 DAT 2-3 DAT	X mL/ha 1000 g/ha	1,2,3,4,5,6,7,8
4. Cultivation Pre-em Herbicide* BARON WP	Pre-plant Pre-plant/or 0 DAT 2-3 DAT	X mL/ha 1000 g/ha	1,2,3,4,5,6,7,8
5. Cultivation Pre-em Herbicide* BARON WP	Pre-plant Pre-plant/or 0 DAT 2-3 WAT	X mL/ha 500 g/ha	1,2,3,4,5,6,7,8
6. Cultivation Pre-em Herbicide* BARON WP BARON WP	Pre-plant Pre-plant/or 0 DAT 3 DAT 2-3 WAT	X mL/ha 1000 g/ha 150 g/ha	1,2,3,4,5,6,7,8
7. Cultivation Pre-em Herbicide* BARON WP BARON WP	Pre-plant Pre-plant/or 0 DAT 3 DAT 2-3 WAT	X mL/ha 1000 g/ha 250 g/ha	1,2,3,4,5,6,7,8
8. Cultivation Pre-em Herbicide* BARON WP BARON WP	Pre-plant Pre-plant/or 0 DAT 3 DAT 2-3 WAT	X mL/ha 1000 g/ha 150 g/ha (shielded)	1,2,3,4,5,6,7,8
9. Cultivation Pre-em Herbicide* BARON WP BARON WP	Pre-plant Pre-plant/or 0 DAT 3 DAT 2-3 WAT	X mL/ha 1000 g/ha 250 g/ha (shielded)	1,2,3,4,5,6,7,8
10. Cultivation Pre-em Herbicide* BARON WP BARON WP	Pre-plant Pre-plant/or 0 DAT 3 DAT 2-3 WAT	X mL/ha 1000 g/ha 500 g/ha (shielded)	1,2,3,4,5,6,7
11. Cultivation FRONTIER-P	Pre-plant 0 DAT	700 mL/ha	1,3,5,6,7
12. Cultivation FRONTIER-P	Pre-plant 0 DAT	1000 mL/ha	1,3,5,6,7
13. Cultivation FRONTIER-P BARON WP	Pre-plant 0 DAT 3 DAT	700 mL/ha 1000 g/ha	1,3,5,6,7
14. Cultivation Pre-em Herbicide* RAMROD	Pre-plant Pre-plant/ or 0 DAT 0 DAT	X mL/ha 9000 mL/ha	5
15. BARON WP	3 DAT	500 g/ha	2
16. BARON WP	3 DAT	1000 g/ha	2

DAT = days after transplanting; WAT = weeks after transplanting

**\*Pre-em Herbicide:** The following herbicides were used in these trials prior to transplanting, or immediately post-transplanting (0-2 DAT):

DUAL GOLD (S-metolachlor) – 1500 mL/ha applied immediately following transplanting in sites 3 and 7 and 2000 mL/ha in sites 1, 2, 4, 6 and 8.

RIFLE 330 (pendimethalin) – 2500 mL/ha applied and incorporated by irrigation prior to transplanting in site 5.

#### 4.1.4 Formulations

NUFARM RIFLE 330 HERBICIDE – an emulsifiable concentrate formulation containing 330 g/L pendimethalin as marketed by Nufarm Australia Limited.

DUAL GOLD HERBICIDE – an emulsifiable concentrate formulation containing 960 g/L S-metolachlor as marketed by Syngenta Crop Protection Pty Ltd.

BARON 400 WP SELECTIVE HERBICIDE – a wettable powder formulation containing 400 g/kg oxyfluorfen as marketed by Agnova Technologies Limited.

FRONTIER-P HERBICIDE – a liquid concentrate formulation containing 720 g/L dimethenamid-P as supplied by Serve-Ag Pty Ltd.

NUFARM RAMROD FLOWABLE HERBICIDE – a suspension concentrate formulation containing 480 g/L propachlor as marketed by Nufarm Australia Limited.

#### 4.1.5 Application Method

##### *Broadcast Treatments*

<b>Trial Number</b>	<b>Location</b>	<b>Equipment</b>	<b>Nozzles</b>	<b>Pressure</b>	<b>Volume/ha</b>
1	Gatton, Qld	Hand boom	11001 flat fan	290 kPa	209 L
2	Mangrove Mountain, NSW	Hand boom	11001 flat fan	210 kPa	80 L/400 L
3	Bathurst, NSW	Hand boom	11001 flat fan	250 kPa	210 L
4	Coldstream, Vic	Hand boom	11001 flat fan	250 kPa	83 L/400 L
5	Werribee, Vic	Hand boom	11001 flat fan	200 kPa	77 L/400 L
6	Devonport, Tas	Hand boom	110015 flat fan	290 kPa	400 L
7	Nairne, SA	Hand boom	11001 flat fan	250 kPa	83 L/400 L
8	Manjimup, WA	Hand boom	11001 flat fan	250 kPa	400 L

##### *Shrouded Spray Equipment*

<b>Trial Number</b>	<b>Location</b>	<b>Equipment</b>	<b>Nozzles</b>	<b>Pressure</b>	<b>Volume/ha</b>
1	Gatton, Qld	Shrouded boom	9404 EVS flat fan	250 kPa	525 L/sprayed ha
2	Mangrove Mountain, NSW	Shrouded boom	9404 EVS flat fan	200 kPa	400 L/sprayed ha
3	Bathurst, NSW	Shrouded boom	9404 EVS flat fan	200 kPa	310 L/sprayed ha
4	Coldstream, Vic	Shrouded boom	9404 EVS flat fan	200 kPa	400 L/sprayed ha
5	Werribee, Vic	Shrouded boom	9404 EVS flat fan	200 kPa	400 L/sprayed ha
6	Devonport, Tas	Shrouded boom	8002 EVS flat fan	200 kPa	400 L/sprayed ha
7	Adelaide, SA	Shrouded boom	9404 EVS flat fan	200 kPa	400 L/sprayed ha
8	Manjimup, WA	Shrouded boom	9404 EVS flat fan	200 kPa	400 L/sprayed ha

#### 4.1.6 Experimental Design

Trial Number	Location	Trial Design	Replicates	Plot size
1	Gatton, Qld	RCB	3	1 bed, 4 rows (1.5 m) X 5 m
2	Mangrove Mountain, NSW	RCB	3	1 bed, 4 rows (1.5 m) X 5 m
3	Bathurst, NSW	RCB	4	1 bed, 4 rows (1.5 m) X 5 m
4	Coldstream, Vic	RCB	3	1 bed, 2 rows (1.5 m) X 5 m
5	Werribee, Vic	RCB	3	1 bed, 4 rows (1.5 m) X 5 m
6	Devonport, Tas	RCB	3	2 m x 6 m
7	Nairne, SA	RCB	3	1 bed, 2 rows (1.5 m) X 5 m
8	Manjimup, WA	RCB	3	1 bed, 4 rows (1.5 m) X 5 m

#### 4.1.7 Assessments

Timing*	Assessment
1 WAT	Crop phytotoxicity
2-3 WAT	Crop phytotoxicity, percentage weed control
4-5 WAT	Crop phytotoxicity, weed count, percentage weed control
6-8 WAT#	Crop phytotoxicity, percentage weed control
10 WAT#	Crop biomass reduction

\*Approximate timings - Assessments commenced around 1 week following the final post-emergence herbicide application which was around 3-4 weeks following transplanting

# not done at all sites

#### *Weed Control*

Weed control assessments were completed on 3-4 occasions. A visual assessment of weed biomass reduction (% control) was completed for each species. Results are given as the mean percentage control. At around 4 WAT a quadrat count was taken and the total number of weeds by species counted. Results are given as the mean number of weeds per square metre.

#### *Phytotoxicity/Crop Damage*

Inspections for crop phytotoxicity were conducted at each visit to the trial sites. Where symptoms were seen crop effects were rated using a 0-100 percentage scale as follows:

- 0 = no effects evident
- 10 = 10% leaf area showing signs of leaf damage/spotting
- 50 = 50% leaf area showing signs of leaf damage/spotting
- 100 = plants dead

#### *Crop Vigour Effects*

Inspections for the effect of treatment on crop vigour was conducted at each visit to the trial sites. Where effects were seen plots were scored for relative crop vigour or biomass relative to the most vigorous plot in that replicate. Results are given as relative crop vigour using a 0-100 scale where 100 = most vigorous plot in each replicate 50 = 50% reduction in biomass and 0 = plants dead.



## 4.2 Project Component 2 – Knockdown Shielded Herbicide Program

### 4.2.1 Efficacy Studies

#### 4.2.1.1 Site Details

Trial Number	Location	Soil Type	Crop	Variety	Experimenter	Transplant Date
1	Gatton, Qld	Black self mulching clay	Broccoli	Atomic	Richard Holzknicht	10-Feb-10
2	Mangrove Mountain, NSW	Sandy loam	Broccoli	Greenbelt	Peter Melville	20-Apr-10
3	Werribee, Vic	Red clay loam	Cauliflower	Skywalker	Marco Montagna	24-Feb-10
4	Nairne, SA	Brown clay loam	Brussels sprouts	Millennium	Bill Frost	22-Jan-10

#### 4.2.1.2 Target Weeds

Trial Number	Location	Weeds
1	Gatton, Qld	Black pigweed ( <i>Trianthema portulacastrum</i> ), sowthistle ( <i>Sonchus oleraceus</i> ), dwarf amaranth ( <i>Amaranthus macrocarpus</i> ), barnyard grass ( <i>Echinochloa crus-galli</i> )
2	Mangrove Mountain, NSW	Potato weed ( <i>Galinsoga parviflora</i> ), chickweed ( <i>Stellaria media</i> ), shepherd's purse ( <i>Capsella bursa-pastoris</i> ), marshmallow ( <i>Malva parviflora</i> ), winter grass ( <i>Poa annua</i> )
3	Werribee, Vic	Stinging nettle ( <i>Urtica urens</i> ), shepherd's purse ( <i>Capsella bursa-pastoris</i> ), wireweed ( <i>Polygonum aviculare</i> ), marshmallow ( <i>Malva parviflora</i> ), sowthistle ( <i>Sonchus oleraceus</i> )
4	Nairne, SA	Fat hen ( <i>Chenopodium album</i> ), wireweed ( <i>Polygonum aviculare</i> ), capeweed ( <i>Arctotheca calendula</i> )

### 4.2.1.3 Treatments

Treatment	Rate Product/ha	Application Timing
1. Control		
2. DUAL GOLD	2000 mL	0 DAT
3. BARON WP*	250 g	3-4 WAT
4. BARON WP*	500 g	3-4 WAT
5. SPOTLIGHT PLUS*	300 mL	3-4 WAT
6. BASTA*	2.5 L	3-4 WAT
7. GRAMOXONE 250*	800 mL	3-4 WAT
8. BASTA + BARON WP*	2.5 L + 250 g	3-4 WAT
9. BASTA + BARON WP*	2.5 L + 500 g	3-4 WAT
10. BASTA + SPOTLIGHT PLUS*	2.5 L + 300 mL	3-4 WAT
11. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3-4 WAT
12. GRAMOXONE 250 + BARON WP*	800 mL + 500 g	3-4 WAT
13. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 300 mL	3-4 WAT

\*DUAL GOLD applied at 0 DAT at 2000 mL/ha site 1 and 2 and 1500 mL/ha site 4, and RIFLE 330 applied at 0 DAT 2500 mL/ha site 3

DAT = days after transplant; WAT = weeks after transplant

### 4.2.1.4 Formulations

NUFARM RIFLE 330 HERBICIDE – an emulsifiable concentrate formulation containing 330 g/L pendimethalin as marketed by Nufarm Australia Limited.

DUAL GOLD HERBICIDE – an emulsifiable concentrate formulation containing 960 g/L S-metolachlor as marketed by Syngenta Crop Protection Pty Ltd.

BARON 400 WP SELECTIVE HERBICIDE – a wettable powder formulation containing 400 g/kg oxyfluorfen as marketed by Agnova Technologies Limited.

BASTA NON-SELECTIVE HERBICIDE – a soluble liquid concentrate formulation containing 200 g/L glufosinate-ammonium as supplied by Bayer CropScience Pty Ltd.

SPOTLIGHT PLUS HERBICIDE – an emulsifiable concentrate formulation containing 60 g/L carfentrazone-ethyl as marketed by FMC Australia Limited.

GRAMOXONE 250 HERBICIDE – a liquid concentrate formulation containing 250 g/L paraquat present as paraquat dichloride as marketed by Syngenta Crop Protection Pty Ltd.

### 4.2.1.5 Application Method

Trial Number	Location	Equipment	Nozzles	Pressure	Volume/ha
1	Gatton, Qld	Shrouded boom	9404 EVS flat fan	250 kPa	525 L/sprayed ha
2	Mangrove Mountain, NSW	Shrouded boom	9404 EVS flat fan	200 kPa	400 L/sprayed ha
3	Werribee, Vic	Shrouded boom	9404 EVS flat fan	200 kPa	400 L/sprayed ha
4	Nairne, SA	Shrouded boom	9404 EVS flat fan	200 kPa	400 L/sprayed ha

#### 4.2.1.6 Experimental Design

Trial Number	Location	Trial Design	Replicates	Plot size
1	Gatton, Qld	RCB	3	1 bed, 4 rows (1.5 m) X 5 m
2	Mangrove Mountain, NSW	RCB	3	1 bed, 4 rows (1.5 m) X 5 m
3	Werribee, Vic	RCB	3	1 bed, 4 rows (1.5 m) X 5 m
4	Nairne, SA	RCB	3	1 bed, 2 rows (1.5 m) X 5 m

#### 4.2.1.7 Assessments

Timing*	Assessment
1 WAT	Crop phytotoxicity
4-5 WAT	Weed count, percentage weed control, crop phytotoxicity
6-8 WAT	Weed count, percentage weed control, crop phytotoxicity
Commercial harvest	Crop yield (sites 2 and 3 only)

\*Approximate timings – Assessments commenced around 1 week following the final post-emergence herbicide application which was around 3-4 weeks following transplanting.

#### *Weed Control*

Weed control assessments were completed on 3-4 occasions. A visual assessment of weed biomass reduction (% control) was completed for each species. Results are given as the mean percentage control. At around 4 WAT a quadrat count was taken and the total number of weeds by species counted. Results are given as the mean number of weeds per square metre.

#### *Phytotoxicity/Crop Damage*

Inspections for crop phytotoxicity were conducted at each visit to the trial sites. Where symptoms were seen crop effects were rated using a 0-100 percentage scale as follows:

- 0 = no effects evident
- 10 = 10% leaf area showing signs of leaf damage/spotting
- 50 = 50% leaf area showing signs of damage/spotting
- 100 = plants dead

#### *Crop Vigour Effects*

Inspections for the effect of treatment on crop vigour was conducted at each visit to the trial sites. Where effects were seen plots were scored for relative crop vigour or biomass relative to the most vigorous plot in that replicate. Results are given as relative crop vigour using a 0-100 scale where 100 = most vigorous plot in each replicate 50 = 50% reduction in biomass and 0 = plants dead.

### ***Crop Yield***

Total yield was assessed at two sites, namely Werribee and Mangrove Mountain. All harvestable plants in each plot were cut and weighed over the 2-3 harvest dates at each site. Results are given as the yield for each assessment date as well as total yield.

## 4.2.2 Residue Studies

### 4.2.2.1 Site Details

Trial Number	Location	Soil Type	Crop	Variety	Principal Investigator	Transplant Date
1	Gatton, Qld	Black self mulching clay	Broccoli	Atomic	Richard Holzknrecht	1-Mar-10
2	Mangrove Mountain, NSW	Sandy loam	Broccoli	Greenbelt	Peter Melville	27-Apr-10
3	Bathurst, NSW	Granitic sandy clay	Cauliflower	Beluga	Neil Adams	24-Feb-10
4	Coldstream, Vic	Grey clay loam	Brussels sprouts	Oliver	Samantha Strano	1-Feb-10
5	Werribee, Vic	Red clay loam	Cauliflower	Skywalker	Samantha Strano	24-Feb-10
6	Forth, Tas	Red clay loam	Broccoli	Iron man	Belinda Ingram (Peracto)	4-Mar-10
7	Nairne, SA	Brown clay loam	Brussels sprouts	Millennium	Bill Frost	20-Jan-10
8	Manjimup, WA	Sandy loam	Cauliflower	Skywalker	Charlie Hewitt	10-Mar-10

### 4.2.2.2 Treatments

Treatment	Rate Product/ha	Application Timing
1. Untreated control		
2. BARON WP	500 g 500 g (shielded)	2-3 DAT 3-4 WAT
3. BARON WP	500 g (shielded)	3-4 WAT
4. SPOTLIGHT PLUS	300 mL (shielded)	3-4 WAT
5. BASTA	2.5 L (shielded)	3-4 WAT
6. GRAMOXONE 250	0.8 L (shielded)	3-4 WAT

DAT = days after transplanting; WAT = weeks after transplanting

### 4.2.2.3 Formulations

BARON 400 WP SELECTIVE HERBICIDE – a wettable powder formulation containing 400 g/kg oxyfluorfen as the active constituent. The sample was supplied by Agnova Technologies Pty Ltd.

BASTA NON-SELECTIVE HERBICIDE – a soluble liquid concentrate formulation containing 200 g/L glufosinate-ammonium as the active constituent. The sample was supplied by Bayer CropScience Pty Ltd.

SPOTLIGHT PLUS HERBICIDE – an emulsifiable concentrate formulation containing 60 g/L carfentrazone-ethyl as the active constituent. The sample was supplied by FMC Chemical Sprrl.

GRAMOXONE 250 HERBICIDE – a soluble liquid formulation containing 250 g/L paraquat present as paraquat dichloride. The sample was as marketed by Syngenta Crop Protection Pty Ltd.

#### 4.2.2.4 Application Method

Treatments were applied in a manner which simulated commercial practice for application of herbicides in vegetable brassicas. Broadcast treatments were applied using a standard hand held boom sprayer, in a water volume of 226 L/ha to 503 L/ha which is representative of commercial application. Inter-row knockdown herbicide applications were completed using a shielded boom sprayer. The boom sprayer was purpose built to allow the application of herbicide along the inter-row space and protect the surrounding brassica plants from drift. The treatments were applied using an application of 220 L/ha to 546 L/ha into the band sprayed area.

#### 4.2.2.5 Experimental Design

Trial Number	Location	Trial Design	Plot Size
1	Gatton, Qld	Unreplicated single plot	2 m X 5 m
2	Mangrove Mountain, NSW	Unreplicated single plot	1.5 m X 2 m
3	Bathurst, NSW	Unreplicated single plot	4 m X 5 m
4	Coldstream, Vic	Unreplicated single plot	2 m X 10 m
5	Werribee, Vic	Unreplicated single plot	2m X 10 m
6	Forth, Tas	Unreplicated single plot	2 m X 8 m
7	Nairne, SA	Unreplicated single plot	1.5 m X 10 m
8	Manjimup, WA	Unreplicated single plot	1.65 m X 7 m

#### 4.2.2.6 Sampling Schedule

Residue sampling was completed at commercial harvest at each site.

Twelve broccoli inflorescences with stem were sampled from 12 individual broccoli plants with a minimum weight of 1 kg of each treatment for each sample.

At least 1 kg of Brussels sprouts were sampled from 12 individual Brussels sprouts plants of each treatment for each sample.

At least 12 cauliflower heads were sampled from 12 individual cauliflower plants with a minimum weight of 1 kg of each treatment for each sample.

#### 4.2.2.7 Residue Analysis

All samples were processed and analysed by Agrisearch Analytical, Unit 1, Victoria Road, Rozelle, NSW.

Oxyfluorfen residues were determined according to an analytical method developed by Agrisearch Analytical Pty Ltd:

*“Determination of Multi-Pesticide Residues in Plant using DSPE” AATM-S-60.1, Revision 1, Agrisearch Analytical Pty Ltd, 18 May 2010*

Carfentrazone-ethyl residues were determined according to the following analytical method supplied by FMC Corporation:

*“Analytical Methodology for the Determination of F8426 and its Acid Metabolites in/on Spring Wheat Forage, Straw and Grain”, Method No. P-3041M, FMC Corporation, Agricultural Products Group, August 1995.*

Glufosinate-ammonium residues were determined according to an analytical method developed by Agrisearch Analytical Pty Ltd:

*“Determination of Glufosinate and Metabolites MPPA and N-acetyl Glufosinate in Plant Material by LC-MS/MS”, AATM-S-78.1, Revision 1, Agrisearch Analytical Pty Ltd, November 2010*

Paraquat residues were determined according to an analytical method developed by Agrisearch Analytical Pty Ltd:

*“Determination of Diquat and Paraquat Residues in Tree Nuts” AATM-S-79, Revision 1, Agrisearch Analytical Pty Ltd, August 2007*

### 4.3 Project Component 3 - Irrigation Incorporation Demonstration

#### 4.3.1 Site Details

Trial Number	Location	Soil Type	Crop	Variety	Experimenter	Transplant Date
1	Gatton, Qld	Black self mulching clay	Broccoli	Atomic	Richard Holzknrecht	1-Mar-10
2	Bathurst, NSW	Granitic sandy clay	Cauliflower	Beluga	Neil Adams	24-Feb-10
3	Werribee, Vic	Red clay loam	Cauliflower	Skywalker	Marco Montagna	24-Feb-10
4	Nairne, SA	Brown clay loam	Brussels sprouts	Millennium	Bill Frost	20-Jan-10
5	Manjimup, WA	Sandy loam	Cauliflower	Skywalker	Charlie Hewitt	10-Mar-10

#### 4.3.2 Target Weeds

Trial Number	Location	Weeds
1	Gatton, Qld	Black pigweed ( <i>Trianthema portulacastrum</i> ), sowthistle ( <i>Sonchus oleraceus</i> ), dwarf amaranth ( <i>Amaranthus macrocarpus</i> ), barnyard grass ( <i>Echinochloa crus-galli</i> )
2	Bathurst, NSW	Saffron thistle ( <i>Carthamus lanatus</i> ), chickweed ( <i>Stellaria media</i> ), pigweed ( <i>Portulaca oleraceus</i> ), deadnettle ( <i>Lamium amplexicaule</i> ), Paterson's curse ( <i>Echium plantagineum</i> ), shepherd's purse ( <i>Capsella bursa-pastoris</i> )
3	Werribee, Vic	Stinging nettle ( <i>Urtica urens</i> ), shepherd's purse ( <i>Capsella bursa-pastoris</i> ), wireweed ( <i>Polygonum aviculare</i> ), marshmallow ( <i>Malva parviflora</i> ), sowthistle ( <i>Sonchus oleraceus</i> )
4	Nairne, SA	Fat hen ( <i>Chenopodium album</i> ), wireweed ( <i>Polygonum aviculare</i> ), capeweed ( <i>Arctotheca calendula</i> )
5	Manjimup, WA	Wild radish ( <i>Raphanus raphanistrum</i> ), dock ( <i>Rumex sp.</i> ), arrow leaf clover ( <i>Trifolium vesiculosum</i> ), fat hen ( <i>Chenopodium album</i> ), annual ryegrass ( <i>Lolium rigidum</i> )



### 4.3.3 Treatments Applied

Treatment	Application Timing	Rate Product/ha	Irrigation
1. Untreated Control	Pre-plant		Management
2. Cultivation Pre-em herbicide# BARON WP	Pre-plant Pre-plant or immediately post-transplant 3 DAT	500-1000 g/ha	No irrigation*
3. Cultivation Pre-em herbicide# BARON WP	Pre-plant Pre-plant or immediately post-transplant 3 DAT	500-1000 g/ha	Irrigation
4. Cultivation Pre-em herbicide# GOAL	Pre-plant Pre-plant or immediately post-transplant 3 DAT	500-1000 g/ha	No irrigation*
5. Cultivation Pre-em herbicide# GOAL	Pre-plant Pre-plant or immediately post-transplant 3 DAT	500-1000 g/ha	Irrigation

\*Broadcast irrigation not applied for at least 7 days following transplanting  
DAT = days after transplanting

Note 1: The BARON WP use rate selected depended upon the soil type and weather conditions at the location. The low rate was used under cold wet conditions (winter) or on light to medium soils and the higher rate in warmer weather on heavier soils.

Note 2: Transplants were watered around the base of the plant for the first 7 days following transplanting.

*\*Pre-em Herbicide:* The following herbicides were used in these trials prior to transplanting, or immediately post-transplanting (0-2 DAT):

DUAL GOLD (S-metolachlor) – 1500 mL/ha applied immediately following transplanting in sites 2 and 4 and 2000 mL/ha in sites 1 and 5.

RIFLE 330 (pendimethalin) – 2500 mL/ha applied and incorporated by irrigation prior to transplanting in site 3.

### 4.3.4 Formulations

NUFARM RIFLE 330 HERBICIDE – an emulsifiable concentrate formulation containing 330 g/L pendimethalin as marketed by Nufarm Australia Limited.

DUAL GOLD HERBICIDE – an emulsifiable concentrate formulation containing 960 g/L S-metolachlor as marketed by Syngenta Crop Protection Pty Ltd.

BARON 400 WP SELECTIVE HERBICIDE – a wettable powder formulation containing 400 g/kg oxyfluorfen as marketed by Agnova Technologies Limited.

GOAL HERBICIDE – an emulsifiable concentrate formulation containing 240 g/L oxyfluorfen as marketed by Dow AgroSciences Limited.

### 4.3.5 Application Method

<b>Trial Number</b>	<b>Location</b>	<b>Equipment</b>	<b>Nozzles</b>	<b>Pressure</b>	<b>Volume/ha</b>
1	Gatton, Qld	Hand boom	11001 flat fan	290 kPa	209 L
2	Bathurst, NSW	Hand boom	11001 flat fan	250 kPa	210 L
3	Werribee, Vic	Hand boom	11001 flat fan	200 kPa	77 L
4	Nairne, SA	Hand boom	11001 flat fan	250 kPa	83 L
5	Manjimup, WA	Hand boom	11001 flat fan	250 kPa	400 L

### 4.3.6 Experimental Design

<b>Trial Number</b>	<b>Location</b>	<b>Trial Design</b>	<b>Plot size</b>
1	Gatton, Qld	Unreplicated demonstration	1 bed, 4 rows (1.5 m) X 7 m
2	Bathurst, NSW	Unreplicated demonstration	1 bed, 4 rows (1.5 m) X 7 m
3	Werribee, Vic	Unreplicated demonstration	1 bed, 4 rows (1.5 m) X 7 m
4	Nairne, SA	Unreplicated demonstration	1 bed, 2 rows (1.5 m) X 7 m
5	Manjimup, WA	Unreplicated demonstration	1 bed, 4 rows (1.5 m) X 7 m

## **5.        RESULTS**

The data presented are a selected summary designed to demonstrate the data trends seen from which the conclusions have been drawn.

These include a summary of weed control data for all weeds species in each trial at around 7-10 weeks following transplanting. In addition a summary of the crop safety data is given as well as the yield results for the two sites in which yield was recorded.

Statistical analyses were conducted using GenStat Release 11.1 (PC/Windows 2008 – Lawes Agricultural Trust, Rothamsted Experimental Station). The model included all treatment effects. Analysis of variance and least significant difference (LSD) procedures were used.

## 5.1 Project Component 1 – Herbicide Strategies

Results are summarised in Tables 1-10.

**Table 1 Summary of Weed Control Results – Trial 1, Gatton, Qld, Broccoli  
Percentage Weed Control 50 Days After Transplanting**

Treatment	Application Timing	Rate Product/ha	<i>Trianthema portulacastrum</i>	<i>Sonchus oleraceus</i>	<i>Amaranthus macrocarpus</i>	<i>Echinochloa crus-galli</i>
1. Cultivation	Pre-plant		0.0	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant Post-plant		96.7	96.7	100.0	96.7
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant 0 DAT 3 DAT	2000 mL/ha 1000 g/ha	100.0	100.0	100.0	100.0
4. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 DAT	2000 mL/ha 1000 g/ha	100.0	100.0	100.0	100.0
5. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 WAT	2000 mL/ha 500 g/ha	95.0	100.0	100.0	100.0
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	2000 mL/ha 1000 g/ha 150 g/ha	100.0	100.0	100.0	98.3
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	2000 mL/ha 1000 g/ha 250 g/ha	100.0	100.0	100.0	100.0
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	2000 mL/ha 1000 g/ha 150 g/ha (shielded)	100.0	100.0	100.0	100.0
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	2000 mL/ha 1000 g/ha 250 g/ha (shielded)	100.0	100.0	100.0	100.0
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	2000 mL/ha 1000 g/ha 500 g/ha (shielded)	100.0	100.0	100.0	100.0
11. Cultivation FRONTIER-P	Pre-plant 0 DAT	700 mL/ha	40.0	96.7	100.0	93.3
12. Cultivation FRONTIER-P	Pre-plant 0 DAT	1000 mL/ha	53.3	100.0	100.0	95.0
13. Cultivation FRONTIER-P BARON WP	Pre-plant 0 DAT 3 DAT	700 mL/ha 1000 g/ha	96.7	96.7	100.0	100.0
F Probability			<0.001	<0.001	ana	<0.001
LDS 5%			11.3	6.8		4.3

ana = analysis not applicable; DAT = days after transplanting; WAT = weeks after transplanting

**Table 2 Summary of Weed Control Results – Trial 2, Mangrove Mountain, NSW, Broccoli - Percentage Weed Control 73 Days After Transplanting**

Treatment	Application Timing	Rate Prod/ha	<i>Galinsoga parviflora</i>	<i>Stellaria media</i>	<i>Capsella bursa pastoris</i>	<i>Malva parviflora</i>
1. Cultivation	Pre-plant		0.0	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant Post-plant		10.0	11.7	20.0	26.7
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant 0 DAT 3 DAT	2000 mL/ha 1000 g/ha	98.3	92.0	100.0	100.0
4. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 DAT	2000 mL/ha 1000 g/ha	100.0	93.3	100.0	100.0
5. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 WAT	2000 mL/ha 500 g/ha	100.0	97.3	100.0	100.0
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	2000 mL/ha 1000 g/ha 150 g/ha	100.0	96.0	100.0	100.0
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	2000 mL/ha 1000 g/ha 250 g/ha	100.0	97.0	100.0	100.0
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	2000 mL/ha 1000 g/ha 150 g/ha (shielded)	100.0	94.0	100.0	100.0
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	2000 mL/ha 1000 g/ha 250 g/ha (shielded)	100.0	95.3	100.0	100.0
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	2000 mL/ha 1000 g/ha 500 g/ha (shielded)	100.0	97.3	100.0	100.0
11. Cultivation BARON WP	Pre-plant 3 DAT	500 g/ha	100.0	5.7	93.3	100.0
12. Cultivation BARON WP	Pre-plant 3 DAT	1000 g/ha	100.0	31.7	100.0	100.0
F Probability			<0.001	<0.001	<0.001	<0.001
LDS 5%			1.4	15.1	7.2	5.9

DAT = days after transplanting; WAT = weeks after transplanting

**Table 3 Summary of Weed Control Results – Trial 3, Bathurst, NSW, Cauliflower Percentage Weed Control 54 Days After Transplanting**

Treatment	Application Timing	Rate Prod/ha	<i>Capsella bursa-pastoris</i>	<i>Carthamus lanatus</i>	<i>Stellaria media</i>	<i>Portulaca oleraceus</i>	<i>Lamium amplexicaule</i>	<i>Echium plantagineum</i>
1. Cultivation	Pre-plant		0	0	0	0	0	0
2. Cultivation Hand Weeding	Pre-plant Post-plant		30	27	20	23	33	30
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant 0 DAT 2 DAT	1500 mL/ha 1000 g/ha	97	77	87	97	97	97
4. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 2 DAT	1500 mL/ha 1000 g/ha	100	97	95	100	100	100
5. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 WAT	1500 mL/ha 500 g/ha	97	87	80	90	100	100
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	1500 mL/ha 1000 g/ha 150 g/ha	98	82	97	100	100	100
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	1500 mL/ha 1000 g/ha 250 g/ha	100	68	95	100	100	100
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	1500 mL/ha 1000 g/ha 150 g/ha (shielded)	100	70	92	93	100	100
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	1500 mL/ha 1000 g/ha 250 g/ha (shielded)	97	80	92	97	97	100
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	1500 mL/ha 1000 g/ha 500 g/ha (shielded)	100	80	98	100	100	100
11. Cultivation FRONTIER-P	Pre-plant 0 DAT	700 mL/ha	73	40	33	57	57	97
12. Cultivation FRONTIER-P	Pre-plant 0 DAT	1000 mL/ha	70	67	47	73	80	97
13. Cultivation FRONTIER-P BARON WP	Pre-plant 0 DAT 3 DAT	700 mL/ha 1000 g/ha	100	57	60	93	100	100
F Probability			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
LDS 5%			12.2	32.7	23.7	25.8	26.8	6.5

DAT = days after transplanting; WAT = weeks after transplanting

**Table 4 Summary of Weed Control Results – Trial 4, Coldstream, Vic, Brussels Sprouts - Percentage Weed Control 51 Days After Transplanting**

Treatment	Application Timing	Rate Prod/ha	<i>Chenopodium album</i>	<i>Arctotheca calendula</i>	<i>Polygonum aviculare</i>	<i>Malva parviflora</i>	<i>Lolium rigidum</i>
1. Cultivation	Pre-plant		0.0	0.0	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant Post-plant		60.0	96.7	93.3	100.0	33.3
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant 0 DAT 3 DAT	2000 mL/ha 1000 g/ha	100.0	90.0	100.0	100.0	100.0
4. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 DAT	2000 mL/ha 1000 g/ha	73.3	83.3	100.0	96.7	100.0
5. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 WAT	2000 mL/ha 500 g/ha	83.3	96.7	100.0	100.0	100.0
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	2000 mL/ha 1000 g/ha 150 g/ha	83.3	100.0	100.0	100.0	100.0
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	2000 mL/ha 1000 g/ha 250 g/ha	80.0	100.0	100.0	100.0	100.0
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	2000 mL/ha 1000 g/ha 150 g/ha (shielded)	100.0	100.0	100.0	100.0	100.0
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	2000 mL/ha 1000 g/ha 250 g/ha (shielded)	83.3	100.0	100.0	100.0	100.0
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	2000 mL/ha 1000 g/ha 500 g/ha (shielded)	90.0	100.0	100.0	100.0	100.0
F Probability			<.001	<.001	<.001	<.001	<0.001
LDS 5%			29.3	18.8	6.3	6.3	31.3

DAT = days after transplanting; WAT = weeks after transplanting

**Table 5 Summary of Weed Control Results – Trial 5, Werribee, Vic, Cauliflower  
Percentage Weed Control 56 Days After Transplanting**

Treatment	Application Timing	Rate Prod/ha	<i>Melba parviflora</i>	<i>Urtica urens</i>	<i>Capsella bursa pastoris</i>	<i>Sonchus oleraceus</i>	<i>Senecio sp</i>
1. Cultivation	Pre-plant		0.0	0.0	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant Post-plant		0.0	0.0	0.0	0.0	0.0
3. Cultivation RIFLE 330 BARON WP Inter-row cultivation	Pre-plant 0 DAT 2 DAT	2500 mL/ha 1000 g/ha	90.0	100.0	100.0	100.0	90.0
4. Cultivation RIFLE 330 BARON WP	Pre-plant 0 DAT 2 DAT	2500 mL/ha 1000 g/ha	100.0	100.0	100.0	100.0	100.0
5. Cultivation RIFLE 330 BARON WP	Pre-plant 0 DAT 3 WAT	2500 mL/ha 500 g/ha	100.0	100.0	100.0	100.0	100.0
6. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2500 mL/ha 1000 g/ha 150 g/ha	93.3	100.0	100.0	100.0	100.0
7. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2500 mL/ha 1000 g/ha 250 g/ha	100.0	100.0	100.0	100.0	100.0
8. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2500 mL/ha 1000 g/ha 150 g/ha (shielded)	100.0	100.0	100.0	100.0	100.0
9. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2500 mL/ha 1000 g/ha 250 g/ha (shielded)	100.0	100.0	100.0	100.0	100.0
10. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2500 mL/ha 1000 g/ha 500 g/ha (shielded)	100.0	100.0	100.0	93.3	100.0
11. Cultivation FRONTIER P	Pre-plant 0 DAT	500 mL/ha	90.0	70.0	96.7	90.0	90.0
12. Cultivation FRONTIER-P	Pre-plant 0 DAT	1000 mL/ha	85.0	100.0	100.0	100.0	93.3
13. Cultivation FRONTIER-P BARON WP	Pre-plant 0 DAT 3 DAT	700 mL/ha 1000 g/ha	100.0	100.0	100.0	100.0	100.0
14. Cultivation RIFLE 330 RAMROD	Pre-plant 0 DAT 0 DAT	2500 mL/ha 9000 mL/ha	66.7	60.0	50.0	100.0	60.0
F Probability			<0.001	<0.001	<0.001	<0.001	<0.001
LDS 5%			28.6	31.0	19.5	6.6	26.4

DAT = days after transplanting; WAT = weeks after transplanting



**Table 6 Summary of Weed Control Results – Trial 6, Devonport, Tas, Broccoli  
Percentage Weed Control 50 Days After Transplanting**

Treatment	Application Timing	Rate Product/ha	<i>Solanum nigrum</i>	<i>Capsella bursa pastoris</i>	<i>Chenopodium album</i>
1. Cultivation	Pre-plant		0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant Post-plant		100.0	100.0	100.0
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant 0 DAT 3 DAT	2000 mL/ha 1000 g/ha	100.0	100.0	100.0
4. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 DAT	2000 mL/ha 1000 g/ha	100.0	100.0	98.3
5. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 WAT	2000 mL/ha 500 g/ha	100.0	100.0	97.7
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	2000 mL/ha 1000 g/ha 150 g/ha	100.0	100.0	100.0
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	2000 mL/ha 1000 g/ha 250 g/ha	100.0	100.0	100.0
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	2000 mL/ha 1000 g/ha 150 g/ha (shielded)	100.0	100.0	100.0
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	2000 mL/ha 1000 g/ha 250 g/ha (shielded)	100.0	100.0	100.0
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	2000 mL/ha 1000 g/ha 500 g/ha (shielded)	100.0	100.0	100.0
11. Cultivation FRONTIER-P	Pre-plant 0 DAT	700 mL/ha	89.7	100.0	78.3
12. Cultivation FRONTIER-P	Pre-plant 0 DAT	1000 mL/ha	100.0	100.0	96.7
13. Cultivation FRONTIER-P BARON WP	Pre-plant 0 DAT 3 DAT	700 mL/ha 1000 g/ha	100.0	100.0	100.0
F Probability			0.001	ana	<0.001
LDS 5%			2.19		3.57

DAT = days after transplanting; WAT = weeks after transplanting

**Table 7 Summary of Weed Control Results – Trial 7, Nairne, SA, Brussels Sprouts - Percentage Weed Control 59 Days After Transplanting**

Treatment	Application Timing	Rate Product/ha	<i>Polygonum aviculare</i>	<i>Chenopodium album</i>	<i>Arctotheca calendula</i>
1. Cultivation	Pre-plant		0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant Post-plant		100.0	100.0	100.0
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant 0 DAT 3 DAT	1500 mL/ha 1000 g/ha	95.7	96.7	96.0
4. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 DAT	1500 mL/ha 1000 g/ha	93.7	95.7	96.0
5. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 WAT	1500 mL/ha 500g/ha	96.7	98.0	100.0
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 150 g/ha	99.7	100.0	100.0
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 250 g/ha	99.0	100.0	100.0
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 150 g/ha (shielded)	99.3	100.0	100.0
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 250 g/ha (shielded)	99.3	100.0	100.0
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 500 g/ha (shielded)	99.3	99.3	100.0
11. Cultivation FRONTIER-P	Pre-plant 0 DAT	700 mL/ha	96.7	97.7	97.3
12. Cultivation FRONTIER-P	Pre-plant 0 DAT	1000 mL/ha	97.3	98.7	99.7
13. Cultivation FRONTIER-P BARON WP	Pre-plant 0 DAT 3 DAT	700 mL/ha 1000 g/ha	99.0	100.0	100.0
F Probability			1.63	1.68	1.31
LDS 5%			<.001	<.001	<.001

DAT = days after transplanting; WAT = weeks after transplanting

**Table 8 Summary of Weed Control Results – Trial 8, Manjimup, WA, Cauliflower Weed Control 46 Days After Transplanting**

Treatment	Application Timing	Rate Prod/ha	<i>Chenopodium album</i>	<i>Trifolium vesiculosum</i>	<i>Arctotheca calendula</i>	<i>Rumex sp</i>	<i>Raphanus raphanistrum</i>
1. Cultivation	Pre-plant		0.0	0.0	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant Post-plant		100.0	70.0	86.7	100.0	68.3
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant 0 DAT 2 DAT	2000 mL/ha 1000 g/ha	98.3	81.7	98.3	100.0	100.0
4. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 2 DAT	2000 mL/ha 1000 g/ha	100.0	83.3	93.3	66.7	100.0
5. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 WAT	2000 mL/ha 500 g/ha	100.0	81.7	68.3	98.3	98.3
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2000 mL/ha 1000 g/ha 150 g/ha	100.0	85.0	98.3	100.0	96.7
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2000 mL/ha 1000 g/ha 250 g/ha	100.0	88.3	100.0	100.0	98.3
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2000 mL/ha 1000 g/ha 150 g/ha (shielded)	100.0	86.7	98.3	100.0	98.3
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2000 mL/ha 1000 g/ha 250 g/ha (shielded)	100.0	86.7	95.0	100.0	93.3
F Probability			<0.001	<0.001	<0.001	<0.001	<0.001
LDS 5%			1.7	24.8	15.4	1.7	19.4

DAT = days after transplanting; WAT = weeks after transplanting

**Table 9 Summary of Phytotoxicity Results – All Trials  
Mean Crop Phytotoxicity Ratings (0-100) at 4-5 weeks Following  
Transplanting**

Treatment	Application Timing	Rate Prod/ha	Gatton (Broccoli)	Mangrove Mountain (Broccoli)	Bathurst (Cauliflower)	Coldstream (Brussels Sprouts)	Werribee (Cauliflower)	Devonport (Broccoli)	Nairne (Brussels sprouts)	Manjimup (Cauliflower)
1. Cultivation	Pre-plant		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant Post-plant		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3. Cultivation Pre-em Herbicide* BARON WP Inter-row cultivation	Pre-plant 0 DAT 2-3 DAT	X mL/ha 1000 g/ha	0.0	0.0	0.0	2.7	5.0	0.0	0.0	0.0
4. Cultivation Pre-em Herbicide* BARON WP	Pre-plant 0 DAT 2-3 DAT	X mL/ha 1000 g/ha	2.0	0.0	0.0	2.7	10.0	0.0	0.0	0.0
5. Cultivation Pre-em Herbicide* BARON WP	Pre-plant 0 DAT 2-3 WAT	X mL/ha 500 g/ha	0.0	0.0	0.0	2.0	3.3	0.0	0.0	0.0
6. Cultivation Pre-em Herbicide* BARON WP BARON WP	Pre-plant 0 DAT 2-3 DAT 2-3 WAT	X mL/ha 1000 g/ha 150 g/ha	2.7	0.0	0.0	2.3	8.3	0.0	0.0	0.0
7. Cultivation Pre-em Herbicide* BARON WP BARON WP	Pre-plant 0 DAT 2-3 DAT 2-3 WAT	X mL/ha 1000 g/ha 250 g/ha	3.0	0.0	0.0	3.0	10.0	0.0	0.0	0.0
8. Cultivation Pre-em Herbicide* BARON WP BARON WP	Pre-plant 0 DAT 2-3 DAT 2-3 WAT	X mL/ha 1000 g/ha 150 g/ha (shielded)	2.3	0.0	0.0	3.0	6.7	0.0	0.0	0.0
9. Cultivation Pre-em Herbicide* BARON WP BARON WP	Pre-plant 0 DAT 2-3 DAT 2-3 WAT	X mL/ha 1000 g/ha 250 g/ha (shielded)	2.7	0.0	0.0	2.7	10.0	0.0	0.0	0.0
10. Cultivation Pre-em Herbicide* BARON WP BARON WP	Pre-plant 0 DAT 2-3 DAT 2-3 WAT	X mL/ha 1000 g/ha 500 g/ha (shielded)	2.7	0.0	0.0	2.7	5.8	0.0	0.0	0.0
11. Cultivation FRONTIER-P	Pre-plant 3 DAT	700 mL/ha	1.3	0.0	0.0	-	2.5	0.0	0.0	0.0
12. Cultivation FRONTIER-P	Pre-plant 3 DAT	1000 mL/ha	1.7	0.0	0.0	-	3.3	0.0	0.0	0.0
13. Cultivation FRONTIER-P BARON WP	Pre-plant Pre-plant 3 DAT	700 mL/ha 1000 g/ha	1.3	0.0	0.0	-	6.7	0.0	0.0	0.0
14. Cultivation Pre-em Herbicide* RAMROD	Pre-plant Pre-plant/ or 0 DAT 0 DAT	X mL/ha 9000 mL/ha	-	-	-	-	2.5	-	-	-
15. Cultivation BARON WP	Pre-plant 3 DAT	500 g/ha	-	0.0	-	-	-	-	-	-
16. Cultivation BARON WP	Pre-plant 3 DAT	1000 g/ha	-	0.0	-	-	-	-	-	-
F Probability			<0.001	ana	ana	<0.001	<0.001	ana	ana	ana
LDS 5%			0.8			3.01	3.01			

DAT = days after transplanting; WAT = weeks after transplanting; ana = analysis not applicable

**\*Pre-em Herbicide:** The following herbicides were used in these trials prior to transplanting, or immediately post-transplanting (0-2 DAT): DUAL GOLD (S-metolachlor) – 1500 mL/ha applied immediately following transplanting in sites 3 and 7 and 2000 mL/ha in sites 1, 2, 4, 6 and 8 and RIFLE 330 (pendimethalin) – 2500 mL/ha applied and incorporated by irrigation prior to transplanting in site 5.

**Table 10 Summary of Crop Vigour Results – All Trials**  
**Mean Crop Vigour Ratings at 7-10 Weeks Following Transplanting**

Treatment	Application Timing	Rate Prod/ha	Gatton	Mangrove Mountain	Bathurst	Coldstream	Werribee	Devonport	Naime	Manjimup
1. Cultivation	Pre-plant	-	100.0	100.0	-	100.0	100.0	100.0	100.0	100.0
2. Cultivation Hand Weeding	Pre-plant Post-plant	-	100.0	100.0	-	100.0	100.0	100.0	100.0	100.0
3. Cultivation Pre-em Herbicide* BARON WP Inter-row cultivation	Pre-plant 0 DAT 32-3 WAT	X mL/ha 1000 g/ha	85.0	100.0	-	93.3	86.7	100.0	100.0	100.0
4. Cultivation Pre-em Herbicide * BARON WP	Pre-plant 0 DAT 2-3 DAT	X mL/ha 1000 g/ha	82.0	96.7	-	90.0	90.0	100.0	100.0	100.0
5. Cultivation Pre-em Herbicide* BARON WP	Pre-plant 0 DAT 2-3 WAT	X mL/ha 500 g/ha	80.0	90.0	-	90.0	93.3	100.0	100.0	100.0
6. Cultivation Pre-em Herbicide* BARON WP BARON WP	Pre-plant 0 DAT 2-3 DAT 2-3 WAT	X mL/ha 1000 g/ha 150 g/ha	80.0	94.0	-	83.3	90.0	100.0	100.0	100.0
7. Cultivation Pre-em Herbicide* BARON WP BARON WP	Pre-plant 0 DAT 2-3 DAT 32-3 WAT	X mL/ha 1000 g/ha 250 g/ha	87.0	96.7	-	83.3	96.7	100.0	100.0	100.0
8. Cultivation Pre-em Herbicide* BARON WP BARON WP	Pre-plant 0 DAT 2-3 DAT 2-3 WAT	X mL/ha 1000 g/ha 150 g/ha (shielded)	83.0	98.3	-	86.7	90.0	100.0	100.0	100.0
9. Cultivation Pre-em Herbicide* BARON WP BARON WP	Pre-plant 0 DAT 2-3 DAT 2-3 WAT	X mL/ha 1000 g/ha 250 g/ha (shielded)	83.0	100.0	-	90.0	86.7	100.0	100.0	100.0
10. Cultivation Pre-em Herbicide* BARON WP BARON WP	Pre-plant 0 DAT 2-3 DAT 2-3 WAT	X mL/ha 1000 g/ha 500 g/ha (shielded)	85.5	92.3	-	96.7	93.3	100.0	100.0	-
11. Cultivation FRONTIER-P	Pre-plant 3 DAT	700 mL/ha	77.0	-	-	-	83.3	100.0	100.0	-
12. Cultivation FRONTIER-P	Pre-plant 3 DAT	1000 mL/ha	78.0	-	-	-	80.0	100.0	100.0	-
13. Cultivation FRONTIER-P BARON WP	Pre-plant Pre-plant 3 DAT	700 mL/ha 1000 g/ha	53.0	-	-	-	83.3	100.0	100.0	-
14. Cultivation Pre-em Herbicide* RAMROD	Pre-plant Pre-plant/ or 0 DAT 0 DAT	X mL/ha 9000 mL/ha	-	-	-	-	96.7	-	-	-
15. Cultivation BARON WP	Pre-plant 3 DAT	500 g/ha	-	96.7	-	-	-	-	-	-
16. Cultivation BARON WP	Pre-plant 3 DAT	1000 g/ha	-	94.0	-	-	-	-	-	-
F Probability			<0.001	0.003		0.002	<0.001	ana	ana	ana
LDS 5%			11	5.01		9.1	8.3			

DAT = days after transplanting; WAT = weeks after transplanting; ana = analysis not applicable

\***Pre-em Herbicide:** The following herbicides were used in these trials prior to transplanting, or immediately post-transplanting (0-2 DAT): DUAL GOLD (S-metolachlor) – 1500 mL/ha applied immediately following transplanting in sites 3 and 7 and 2000 mL/ha in sites 1, 2, 4, 6 and 8 and RIFLE 330 (pendimethalin) – 2500 mL/ha applied and incorporated by irrigation prior to transplanting in site 5.

## 5.2 Project Component 2 – Knockdown Shielded Herbicide Program

### 5.2.1 Efficacy Studies

Results are summarised in Tables 11-18.

**Table 11 Summary of Weed Control Results – Trial 1, Gatton, Qld, Broccoli Weed Control 50 Days After Transplanting**

Treatment	Rate Prod/ha	Application Timing	<i>Trianthema portulacastrum</i>	<i>Sonchus oleraceus</i>	<i>Amaranthus macrocarpus</i>	<i>Echinochloa crus-galli</i>
1. Control			0.0	0.0	0.0	0.0
2. DUAL GOLD	2000 mL	0 DAT	73.3	96.7	60.0	93.3
3. BARON WP*	250 g	3 WAT	100.0	100.0	100.0	100.0
4. BARON WP*	500 g	3 WAT	100.0	100.0	96.7	100.0
5. SPOTLIGHT PLUS*	300 mL	3 WAT	95.0	100.0	100.0	100.0
6. BASTA*	2.5 L	3 WAT	100.0	100.0	100.0	100.0
7. GRAMOXONE 250*	800 mL	3 WAT	65.0	93.3	91.7	91.7
8. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	96.7	100.0	100.0	100.0
9. BASTA + BARON WP*	2.5 L + 500 g	3 WAT	98.3	100.0	100.0	100.0
10. BASTA + SPOTLIGHT PLUS*	2.5 L + 300 mL	3 WAT	100.0	100.0	100.0	100.0
11. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	98.3	100.0	95.0	100.0
12. GRAMOXONE 250 + BARON WP*	800 mL + 500 g	3 WAT	96.7	100.0	100.0	100.0
13. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 300 mL	3 WAT	96.7	96.7	100.0	98.3
F Probability			<0.001	<0.001	<0.001	<0.001
LDS 5%			17.60	6.70	6.80	7.40

\*DUAL GOLD applied at 0 DAT at 2000 mL/ha

DAT = days after transplant; WAT = weeks after transplant

**Table 12 Summary of Weed Control Results – Trial 2, Mangrove Mountain, NSW, Broccoli - Weed Control 75 Days After Transplanting**

Treatment	Rate Prod/ha	Application Timing	<i>Galinsoga parviflora</i>	<i>Stellaria media</i>	<i>Capsella bursa pastoris</i>	<i>Poa annua</i>
1. Control			0.0	0.0	0.0	0.0
2. BARON WP*	250 g	3 WAT	96.7	83.3	100.0	67.7
3. BARON WP*	500 g	3 WAT	100.0	90.7	100.0	98.7
4. SPOTLIGHT PLUS*	300 mL	3 WAT	100.0	78.3	100.0	53.3
5. BASTA*	2.5 L	3 WAT	100.0	92.0	91.7	93.0
6. GRAMOXONE 250*	800 mL	3 WAT	100.0	85.0	100.0	89.7
7. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	100.0	95.0	100.0	98.3
8. BASTA + BARON WP*	2.5 L + 500 g	3 WAT	100.0	96.0	100.0	99.3
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 300 mL	3 WAT	100.0	90.0	100.0	94.3
10. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	100.0	96.3	100.0	97.3
11. GRAMOXONE 250 + BARON WP*	800 mL + 500 g	3 WAT	100.0	95.3	100.0	96.7
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 300 mL	3 WAT	100.0	91.3	100.0	99.7
F Probability			<0.001	<0.001	ana	<0.001
LDS 5%			5.64	21.03		23.95

\*DUAL GOLD applied at 0 DAT at 2000 mL/ha

DAT = days after transplant; WAT = weeks after transplant; ana = analysis not applicable

**Table 13 Summary of Weed Control Results – Trial 3, Werribee, Vic, Cauliflower Weed Control 56 Days After Transplanting**

Treatment	Rate Prod/ha	Application Timing	<i>Malva parviflora</i>	<i>Urtica urens</i>	<i>Capsella bursa pastoris</i>	<i>Sonchus oleraceus</i>	<i>Senecio sp</i>
1. Control			0.0	0.0	0.0	0.0	0.0
2. BARON WP*	250 g	3 WAT	100.0	100.0	100.0	93.3	100.0
3. BARON WP*	500 g	3 WAT	100.0	100.0	100.0	93.3	100.0
4. SPOTLIGHT PLUS*	300 mL	3 WAT	100.0	100.0	100.0	90.0	100.0
5. BASTA*	2.5 L	3 WAT	93.3	93.3	100.0	88.3	100.0
6. GRAMOXONE 250*	800 mL	3 WAT	98.3	100.0	100.0	91.7	96.7
7. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	100.0	100.0	100.0	95.0	100.0
8. BASTA + BARON WP*	2.5 L + 500 g	3 WAT	98.3	100.0	100.0	95.0	100.0
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 300 mL	3 WAT	96.7	100.0	100.0	93.3	100.0
10. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	98.3	100.0	100.0	96.7	100.0
11. GRAMOXONE 250 + BARON WP*	800 mL + 500 g	3 WAT	100.0	100.0	100.0	96.7	100.0
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 300 mL	3 WAT	66.7	66.7	100.0	95.0	100.0
F Probability			<0.001	<0.001	ana	<0.001	<0.001
LDS 5%			28.9	29.0		2.8	7.0

\*RIFLE 330 applied at 0 DAT 2500 mL/ha

DAT = days after transplant; WAT = weeks after transplant; ana = analysis not applicable

**Table 14 Summary of Weed Control Results – Trial 4, Nairne, SA, Brussels Sprouts - Weed Control 63 Days After Transplanting**

Treatment	Rate Prod/ha	Application Timing	<i>Polygonum aviculare</i>	<i>Chenopodium album</i>	<i>Arctotheca calendula</i>
1. Control			0.0	0.0	0.0
2. BARON WP*	250 g	3 WAT	100.0	100.0	100.0
3. BARON WP*	500 g	3 WAT	100.0	100.0	100.0
4. SPOTLIGHT PLUS*	300 mL	3 WAT	100.0	100.0	100.0
5. BASTA*	2.5 L	3 WAT	100.0	100.0	100.0
6. GRAMOXONE 250*	800 mL	3 WAT	98.3	99.3	99.3
7. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	100.0	100.0	100.0
8. BASTA + BARON WP*	2.5 L + 500 g	3 WAT	100.0	100.0	100.0
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 300 mL	3 WAT	100.0	100.0	100.0
10. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	100.0	100.0	100.0
11. GRAMOXONE 250 + BARON WP*	800 mL + 500 g	3 WAT	100.0	100.0	100.0
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 300 mL	3 WAT	100.0	100.0	100.0
F Probability			<.001	<.001	<.001
LDS 5%			1.37	0.55	0.55

\*DUAL GOLD applied at 0 DAT at 1500 mL/ha

DAT = days after transplant; WAT = weeks after transplant

**Table 15 Summary of Phytotoxicity Results – All Trials  
Mean Crop Phytotoxicity Ratings (0-100) at 4-5 weeks Following  
Transplanting (1 week following application)**

Treatment	Rate Prod/ha	Application Timing	Gatton (broccoli)	Mangrove Mountain (Broccoli)	Werribee (cauliflower)	Nairne (Brussels sprouts)
1. Control			0.0	0.0	0.0	0.0
2. DUAL GOLD (Site 1 Only)	2000 mL	0 DAT	0.0	-	-	-
3. BARON WP*	250 g	3 WAT	0.0	0.0	8.3	0.0
4. BARON WP*	500 g	3 WAT	0.0	0.0	8.3	0.0
5.SPOTLIGHT PLUS*	300 mL	3 WAT	0.0	73.3	18.3	6.3
6. BASTA*	2.5 L	3 WAT	0.0	26.7	13.3	7.7
7. GRAMOXONE 250*	800 mL	3 WAT	0.0	60.0	13.3	19.3
8. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	0.0	23.3	16.7	12.0
9. BASTA + BARON WP*	2.5 L + 500 g	3 WAT	0.0	16.7	10.0	15.3
10. BASTA+ SPOTLIGHT PLUS*	2.5 L 300 mL	3 WAT	0.0	73.3	11.7	16.3
11. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	0.0	56.7	16.7	23.0
12. GRAMOXONE 250 + BARON WP*	800 mL + 500 g	3 WAT	0.0	20.0	13.3	27.0
13. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 300 mL	3 WAT	0.0	40.0	15.0	29.3
F Probability			ana	<0.001	0.049	<.001
LDS 5%				34.4	9.69	3.95

\*DUAL GOLD applied at 0 DAT at 2000 mL/ha site 1 and 2 and 1500 mL/ha site 4, and RIFLE 330 applied at 0 DAT 2500 mL/ha site 3

DAT = days after transplant; WAT = weeks after transplant; ana = analysis not applicable

**Table 16 Summary of Crop Vigour Results – All Trials  
Mean Crop Vigour Ratings at 7-8 Weeks Following Transplanting**

Treatment	Rate Prod/ha	Application Timing	Gatton (broccoli)	Mangrove Mountain (Broccoli)	Werribee (cauliflower)	Nairne (Brussels sprouts)
1. Control			100.0	100.00	100.00	100.0
2. DUAL GOLD (Site 1 Only)	2000 mL/ha	0 DAT	83.3	-	-	-
3. BARON WP*	250 g	3 WAT	90.0	100.00	100.0	100.00
4. BARON WP*	500 g	3 WAT	85.0	97.33	96.7	100.00
5. SPOTLIGHT PLUS*	300 mL	3 WAT	80.0	92.67	93.3	87.67
6. BASTA*	2.5 L	3 WAT	80.0	95.67	93.3	96.33
7. GRAMOXONE 250*	800 mL	3 WAT	76.7	92.33	93.3	77.33
8. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	83.3	92.00	93.3	100.00
9. BASTA + BARON WP*	2.5 L + 500 g	3 WAT	83.3	97.33	90.0	99.00
10. BASTA + SPOTLIGHT PLUS*	2.5 L + 300 mL	3 WAT	80.0	95.33	90.0	87.33
11. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	80.0	92.33	90.0	76.00
12. GRAMOXONE 250 + BARON WP*	800 mL + 500g	3 WAT	83.3	93.67	90.0	70.67
13. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 300 mL	3 WAT	76.7	100.00	96.7	77.67
F Probability			0.002	0.001	0.778	0.001
LDS 5%			0.9	2.29	ns	3.51

\*DUAL GOLD applied at 0 DAT at 2000 mL/ha site 1 and 2 and 1500 mL/ha site 4, and RIFLE 330 applied at 0 DAT 2500 mL/ha site 3

DAT = days after transplant; WAT = weeks after transplant; ns = not significant



**Table 17 Summary of Yield Results – Mangrove Mountain - Broccoli Yield**

Treatment	Rate Prod/ha	Application Timing	50 DAT Assessment	70 DAT Assessment
1. Control			5.350	2.260
2. BARON WP*	250 g	3 WAT	2.990	1.220
3. BARON WP*	500 g	3 WAT	3.070	1.780
4. SPOTLIGHT PLUS*	300 mL	3 WAT	3.280	1.450
5. BASTA*	2.5 L	3 WAT	4.490	1.540
6. GRAMOXONE 250*	800 mL	3 WAT	5.530	2.070
7. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	3.260	1.330
8. BASTA + BARON WP*	2.5 L + 500 g	3 WAT	3.250	3.030
9. BASTA + SPOTLIGHT PLUS*	2.5 L 300 mL	3 WAT	4.930	2.750
10. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	5.150	2.540
11. GRAMOXONE 250 + BARON WP*	800 mL + 500g	3 WAT	6.120	1.760
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 300 mL	3 WAT	4.570	2.090
F Probability			<0.001	<0.1
LDS 5%			1.300	

\*DUAL GOLD applied at 0 DAT at 2000 mL/ha

DAT = days after transplant; WAT = weeks after transplant; ns = not significant

**Table 18 Summary of Yield Results – Werribee - Cauliflower Yield**

Treatment	Rate Prod/ha	Application Timing	50 DAT Assessment	70 DAT Assessment	76 DAT Assessment
1.Control			11.156	32.889	3.733
2.BARON WP*	250 g	3 WAT	10.391	21.431	7.689
3.BARON WP*	500 g	3 WAT	8.831	33.684	7.822
4.SPOTLIGHT PLUS*	300 mL	3 WAT	12.796	24.391	7.818
5.BASTA*	2.5 L	3 WAT	9.262	24.111	8.662
6.GRAMOXONE 250*	800 mL	3 WAT	9.796	17.689	5.004
7.BASTA + BARON WP*	2.5 L + 250 g	3 WAT	9.978	22.262	9.862
8.BASTA + BARON WP*	2.5 L + 500 g	3 WAT	17.182	21.996	7.609
9. BASTA + SPOTLIGHT PLUS*	2.5 L 300 mL	3 WAT	11.253	19.867	7.467
10. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	9.333	24.004	7.720
11. GRAMOXONE 250 + BARON WP*	800 mL + 500g	3 WAT	7.431	16.173	9.093
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 300 mL	3 WAT	16.258	14.978	5.916
F Probability			0.538	0.003	0.714
LDS 5%			ns	8.4	ns

\*RIFLE 330 applied at 0 DAT 2500 mL/ha.

DAT = days after transplant; WAT = weeks after transplant; ns = not significant

## 5.2.2 Residue Studies

Results are summarised in Tables 19-50.

Full analytical results are presented in the Agrisearch Analytical reports 10-0255O, 10-0255C, 10-0255G, 10-0255P and are presented in the report 'Integrated Weed Management In Vegetable Brassicas, Australia, 2010 - A Study Conducted Under OECD Good Laboratory Practice [GLP]' which has been provided to HAL as a separate document.

**Table 19 Residues of Oxyfluorfen in Broccoli Treated with BARON WP via Field Trial 090615, Gatton Qld**

Sample No.	Treatment Rate (g/ha)	Sampling Timing	Sampling Date	Oxyfluorfen (mg/kg)
090615-1	Untreated Control	--	15-Apr-10	<LOD
090615-3	500	First commercial harvest	15-Apr-10	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.05 mg/kg for oxyfluorfen.

LOD = Limit of Detection (as received basis) = 0.02 mg/kg for oxyfluorfen

Note: Results for test samples are not corrected for recoveries.

**Table 20 Residues of Oxyfluorfen in Broccoli Treated with BARON WP via Field Trial 090616, Mangrove Mountain, NSW**

Sample No.	Treatment Rate (g/ha)	Sampling Timing	Sampling Date	Oxyfluorfen (mg/kg)
090616-1	Untreated Control	--	02-Aug-10	<LOD
090616-2	500+500	First commercial harvest	02-Aug-10	<LOD
090616-3	500	First commercial harvest	02-Aug-10	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.05 mg/kg for oxyfluorfen.

LOD = Limit of Detection (as received basis) = 0.02 mg/kg for oxyfluorfen

Note: Results for test samples are not corrected for recoveries.

**Table 21 Residues of Oxyfluorfen in Cauliflower Treated with BARON WP via Field Trial 090617, Bathurst, NSW**

Sample No.	Treatment Rate (g/ha)	Sampling Timing	Sampling Date	Oxyfluorfen (mg/kg)
090617-1	Untreated Control	--	24-Aug-10	<LOD
090617-2	500+500	First commercial harvest	24-Aug-10	<LOD
090617-3	500	First commercial harvest	24-Aug-10	0.02*

LOQ = Limit of Quantitation (as received basis) = 0.05 mg/kg for oxyfluorfen.

LOD = Limit of Detection (as received basis) = 0.02 mg/kg for oxyfluorfen

Note: The results marked with the \* are between LOD and LOQ. As the reported values are less than the LOQ, by definition, their accuracy and precision cannot be verified.

Note: Results for test samples are not corrected for recoveries.

**Table 22 Residues of Oxyfluorfen in Cauliflower Treated with BARON WP via Field Trial 090618, Werribee, Vic**

Sample No.	Treatment Rate (g/ha)	Sampling Timing	Sampling Date	Oxyfluorfen (mg/kg)
090618-1	Untreated Control	--	24-May-10	<LOD
090618-2	500+500	First commercial harvest	24-May-10	<LOD
090618-3	500	First commercial harvest	24-May-10	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.05 mg/kg for oxyfluorfen.

LOD = Limit of Detection (as received basis) = 0.02 mg/kg for oxyfluorfen

Note: Results for test samples are not corrected for recoveries.

**Table 23 Residues of Oxyfluorfen in Brussels Sprouts Treated with BARON WP via Field Trial 090619, Coldstream, Vic**

Sample No.	Treatment Rate (g/ha)	Sampling Timing	Sampling Date	Oxyfluorfen (mg/kg)
090619-1	Untreated Control	--	05-Jul-10	<LOD
090619-2	500+500	First commercial harvest	05-Jul-10	<LOD
090619-3	500	First commercial harvest	05-Jul-10	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.05 mg/kg for oxyfluorfen.

LOD = Limit of Detection (as received basis) = 0.02 mg/kg for oxyfluorfen

Note: Results for test samples are not corrected for recoveries.

**Table 24 Residues of Oxyfluorfen in Broccoli Treated with BARON WP via Field Trial 090620, Forth, Tas**

Sample No.	Treatment Rate (g/ha)	Sampling Timing	Sampling Date	Oxyfluorfen (mg/kg)
090620-1	Untreated Control	--	02-Jun-10	<LOD
090620-2	500+500	First commercial harvest	02-Jun-10	<LOD
090620-3	500	First commercial harvest	02-Jun-10	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.05 mg/kg for oxyfluorfen.

LOD = Limit of Detection (as received basis) = 0.02 mg/kg for oxyfluorfen

Note: Results for test samples are not corrected for recoveries.

**Table 25 Residues of Oxyfluorfen in Brussels Sprouts Treated with BARON WP via Field Trial 090621, Nairne, SA**

Sample No.	Treatment Rate (g/ha)	Sampling Timing	Sampling Date	Oxyfluorfen (mg/kg)
090621-1	Untreated Control	--	23-Jun-10	<LOD
090621-2	500+500	First commercial harvest	23-Jun-10	<LOD
090621-3	500	First commercial harvest	23-Jun-10	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.05 mg/kg for oxyfluorfen.

LOD = Limit of Detection (as received basis) = 0.02 mg/kg for oxyfluorfen

Note: Results for test samples are not corrected for recoveries.

**Table 26 Residues of Oxyfluorfen in Cauliflower Treated with BARON WP via Field Trial 090622, Manjimup, WA**

Sample No.	Treatment Rate (g/ha)	Sampling Timing	Sampling Date	Oxyfluorfen (mg/kg)
090622-1	Untreated Control	--	02-Jun-10	<LOD
090622-2	500+500	First commercial harvest	02-Jun-10	<LOD
090622-3	500	First commercial harvest	02-Jun-10	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.05 mg/kg for oxyfluorfen.

LOD = Limit of Detection (as received basis) = 0.02 mg/kg for oxyfluorfen

Note: Results for test samples are not corrected for recoveries.

**Table 27 Residues of Carfentrazone-ethyl in Broccoli Treated with SPOTLIGHT PLUS via Field Trial 090615, Gatton, Qld**

Sample No.	Treatment Rate (mL/ha)	Sampling Timing	Sampling Date	Carfentrazone-ethyl (mg/kg)
090615-1	Untreated Control	--	15-Apr-10	<LOD
090615-4	300	First commercial harvest	15-Apr-10	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.05 mg/kg for carfentrazone-ethyl.

LOD = Limit of Detection (as received basis) = 0.02 mg/kg for carfentrazone-ethyl

Note: Results for test samples are not corrected for recoveries.

**Table 28 Residues of Carfentrazone-ethyl in Broccoli Treated with SPOTLIGHT PLUS via Field Trial 090616, Mangrove Mountain, NSW**

Sample No.	Treatment Rate (mL/ha)	Sampling Timing	Sampling Date	Carfentrazone-ethyl (mg/kg)
090616-1	Untreated Control	--	02-Aug-10	<LOD
090616-4	300	First commercial harvest	02-Aug-10	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.05 mg/kg for carfentrazone-ethyl.

LOD = Limit of Detection (as received basis) = 0.02 mg/kg for carfentrazone-ethyl

Note: Results for test samples are not corrected for recoveries.

**Table 29 Residues of Carfentrazone-ethyl in Cauliflower Treated with SPOTLIGHT PLUS via Field Trial 090617, Bathurst, NSW**

Sample No.	Treatment Rate (mL/ha)	Sampling Timing	Sampling Date	Carfentrazone-ethyl (mg/kg)
090617-1	Untreated Control	--	24-Aug-10	<LOD
090617-4	300	First commercial harvest	24-Aug-10	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.05 mg/kg for carfentrazone-ethyl.

LOD = Limit of Detection (as received basis) = 0.02 mg/kg for carfentrazone-ethyl

Note: Results for test samples are not corrected for recoveries.

**Table 30 Residues of Carfentrazone-ethyl in Cauliflower Treated with SPOTLIGHT PLUS via Field Trial 090618, Werribee, Vic**

Sample No.	Treatment Rate (mL/ha)	Sampling Timing	Sampling Date	Carfentrazone-ethyl (mg/kg)
090618-1	Untreated Control	--	24-May-10	<LOD
090618-4	300	First commercial harvest	24-May-10	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.05 mg/kg for carfentrazone-ethyl.

LOD = Limit of Detection (as received basis) = 0.02 mg/kg for carfentrazone-ethyl

Note: Results for test samples are not corrected for recoveries.

**Table 31 Residues of Carfentrazone-ethyl in Brussels Sprouts Treated with SPOTLIGHT PLUS via Field Trial 090619, Coldstream, Vic**

Sample No.	Treatment Rate (mL/ha)	Sampling Timing	Sampling Date	Carfentrazone-ethyl (mg/kg)
090619-1	Untreated Control	--	05-Jul-10	<LOD
090619-4	300	First commercial harvest	05-Jul-10	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.05 mg/kg for carfentrazone-ethyl.

LOD = Limit of Detection (as received basis) = 0.02 mg/kg for carfentrazone-ethyl

Note: Results for test samples are not corrected for recoveries.

**Table 32 Residues of Carfentrazone-ethyl in Broccoli Treated with SPOTLIGHT PLUS via Field Trial 090620, Forth, Tas**

Sample No.	Treatment Rate (mL/ha)	Sampling Timing	Sampling Date	Carfentrazone-ethyl (mg/kg)
090620-1	Untreated Control	--	02-Jun-10	<LOD
090620-4	300	First commercial harvest	02-Jun-10	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.05 mg/kg for carfentrazone-ethyl.

LOD = Limit of Detection (as received basis) = 0.02 mg/kg for carfentrazone-ethyl

**Table 33 Residues of Carfentrazone-ethyl in Brussels Sprouts Treated with SPOTLIGHT PLUS via Field Trial 090621, Nairne, SA**

Sample No.	Treatment Rate (mL/ha)	Sampling Timing	Sampling Date	Carfentrazone-ethyl (mg/kg)
090621-1	Untreated Control	--	23-Jun-10	<LOD
090621-4	300	First commercial harvest	23-Jun-10	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.05 mg/kg for carfentrazone-ethyl.

LOD = Limit of Detection (as received basis) = 0.02 mg/kg for carfentrazone-ethyl

Note: Results for test samples are not corrected for recoveries.

**Table 34 Residues of Carfentrazone-ethyl in Cauliflower Treated with SPOTLIGHT PLUS via Field Trial 090622, Manjimup, WA**

Sample No.	Treatment Rate (mL/ha)	Sampling Timing	Sampling Date	Carfentrazone-ethyl (mg/kg)
090622-1	Untreated Control	--	02-Jun-10	<LOD
090622-4	300	First commercial harvest	02-Jun-10	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.05 mg/kg for carfentrazone-ethyl.

LOD = Limit of Detection (as received basis) = 0.02 mg/kg for carfentrazone-ethyl

Note: Results for test samples are not corrected for recoveries.

**Table 35 Residues of Total Glufosinate in Broccoli Treated with BASTA via Field Trial 090615, Gatton, Qld**

Sample No.	Treatment Rate (L/ha)	Sampling Timing	Sampling Date	Glufosinate (mg/kg)	MPPA	N-acetyl Glufosinate
090615-1	Untreated Control	--	15-Apr-10	<LOD	<LOD	<LOD
090615-5	2.5	First commercial harvest	15-Apr-10	<LOD	<LOD	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.05 mg/kg

LOD = Limit of Detection (as received basis) = 0.02 mg/kg

Total Glufosinate = Sum of glufosinate-ammonium, N-acetyl glufosinate and 3-[hydroxy(methyl)-phosphinoyl] propionic acid, expressed as glufosinate (free acid). Individual compounds were <LOD, therefore total glufosinate for all samples are <LOD.

**Table 36 Residues of Total Glufosinate in Broccoli Treated with BASTA via Field Trial 090616, Mangrove Mountain, NSW**

Sample No.	Treatment Rate (L/ha)	Sampling Timing	Sampling Date	Glufosinate (mg/kg)	MPPA	N-acetyl Glufosinate
090616-1	Untreated Control	--	02-Aug-10	<LOD	<LOD	<LOD
090616-5	2.5	First commercial harvest	02-Aug-10	<LOD	<LOD	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.05 mg/kg

LOD = Limit of Detection (as received basis) = 0.02 mg/kg

Total Glufosinate = Sum of glufosinate-ammonium, N-acetyl glufosinate and 3-[hydroxy(methyl)-phosphinoyl] propionic acid, expressed as glufosinate (free acid). Individual compounds were <LOD, therefore total glufosinate for all samples are <LOD.

**Table 37 Residues of Total Glufosinate in Cauliflower Treated with BASTA via Field Trial 090617, Bathurst, NSW**

Sample No.	Treatment Rate (L/ha)	Sampling Timing	Sampling Date	Glufosinate (mg/kg)	MPPA	N-acetyl Glufosinate
090617-1	Untreated Control	--	24-Aug-10	<LOD	<LOD	<LOD
090617-5	2.5	First commercial harvest	24-Aug-10	<LOD	<LOD	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.05 mg/kg

LOD = Limit of Detection (as received basis) = 0.02 mg/kg

Total Glufosinate = Sum of glufosinate-ammonium, N-acetyl glufosinate and 3-[hydroxy(methyl)-phosphinoyl] propionic acid, expressed as glufosinate (free acid). Individual compounds were <LOD, therefore total glufosinate for all samples are <LOD.

**Table 38 Residues of Total Glufosinate in Cauliflower Treated with BASTA via Field Trial 090618, Werribee, Vic**

Sample No.	Treatment Rate (L/ha)	Sampling Timing	Sampling Date	Glufosinate (mg/kg)	MPPA	N-acetyl Glufosinate
090618-1	Untreated Control	--	24-May-10	<LOD	<LOD	<LOD
090618-5	2.5	First commercial harvest	24-May-10	<LOD	<LOD	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.05 mg/kg

LOD = Limit of Detection (as received basis) = 0.02 mg/kg

Total Glufosinate = Sum of glufosinate-ammonium, N-acetyl glufosinate and 3-[hydroxy(methyl)-phosphinoyl] propionic acid, expressed as glufosinate (free acid). Individual compounds were <LOD, therefore total glufosinate for all samples are <LOD.

**Table 39 Residues of Total Glufosinate in Brussels Sprouts Treated with BASTA via Field Trial 090619, Coldstream, Vic**

Sample No.	Treatment Rate (L/ha)	Sampling Timing	Sampling Date	Glufosinate (mg/kg)	MPPA	N-acetyl Glufosinate
090619-1	Untreated Control	--	05-Jul-10	<LOD	<LOD	<LOD
090619-5	2.5	First commercial harvest	05-Jul-10	<LOD	<LOD	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.05 mg/kg

LOD = Limit of Detection (as received basis) = 0.02 mg/kg

Total Glufosinate = Sum of glufosinate-ammonium, N-acetyl glufosinate and 3-[hydroxy(methyl)-phosphinoyl] propionic acid, expressed as glufosinate (free acid). Individual compounds were <LOD, therefore total glufosinate for all samples are <LOD.

**Table 40 Residues of Total Glufosinate in Broccoli Treated with BASTA via Field Trial 090620, Forth, Tas**

Sample No.	Treatment Rate (L/ha)	Sampling Timing	Sampling Date	Glufosinate (mg/kg)	MPPA	N-acetyl Glufosinate
090620-1	Untreated Control	--	02-Jun-10	<LOD	<LOD	<LOD
090620-5	2.5	First commercial harvest	02-Jun-10	<LOD	<LOD	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.05 mg/kg

LOD = Limit of Detection (as received basis) = 0.02 mg/kg

Total Glufosinate = Sum of glufosinate-ammonium, N-acetyl glufosinate and 3-[hydroxy(methyl)-phosphinoyl] propionic acid, expressed as glufosinate (free acid). Individual compounds were <LOD, therefore total glufosinate for all samples are <LOD.



**Table 41 Residues of Total Glufosinate in Brussels Sprouts Treated with BASTA via Field Trial 090621, Nairne, SA**

Sample No.	Treatment Rate (L/ha)	Sampling Timing	Sampling Date	Glufosinate (mg/kg)	MPPA	N-acetyl Glufosinate
090621-1	Untreated Control	--	23-Jun-10	<LOD	<LOD	<LOD
090621-5	2.5	First commercial harvest	23-Jun-10	<LOD	<LOD	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.05 mg/kg

LOD = Limit of Detection (as received basis) = 0.02 mg/kg

Total Glufosinate = Sum of glufosinate-ammonium, N-acetyl glufosinate and 3-[hydroxy(methyl)-phosphinoyl] propionic acid, expressed as glufosinate (free acid). Individual compounds were <LOD, therefore total glufosinate for all samples are <LOD.

**Table 42 Residues of Total Glufosinate in Cauliflower Treated with BASTA via Field Trial 090622, Manjimup, WA**

Sample No.	Treatment Rate (L/ha)	Sampling Timing	Sampling Date	Glufosinate (mg/kg)	MPPA	N-acetyl Glufosinate
090622-1	Untreated Control	--	02-Jun-10	<LOD	<LOD	<LOD
090622-5	2.5	First commercial harvest	02-Jun-10	<LOD	<LOD	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.05 mg/kg

LOD = Limit of Detection (as received basis) = 0.02 mg/kg

Total Glufosinate = Sum of glufosinate-ammonium, N-acetyl glufosinate and 3-[hydroxy(methyl)-phosphinoyl] propionic acid, expressed as glufosinate (free acid). Individual compounds were <LOD, therefore total glufosinate for all samples are <LOD.

**Table 43 Residues of Paraquat in Broccoli Treated with GRAMOXONE 250 via Field Trial 090615, Gatton, Qld**

Sample No.	Treatment Rate (L/ha)	Sampling Timing	Sampling Date	Paraquat (mg/kg)
090615-1	Untreated Control	--	15-Apr-10	<LOD
090615-6	0.8	First commercial harvest	15-Apr-10	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.03 mg/kg for paraquat

LOD = Limit of Detection (as received basis) = 0.01 mg/kg for paraquat

Note: Results for test samples are not corrected for recoveries.

**Table 44 Residues of Paraquat in Broccoli Treated with GRAMOXONE 250 via Field Trial 090616, Mangrove Mountain, NSW**

Sample No.	Treatment Rate (L/ha)	Sampling Timing	Sampling Date	Paraquat (mg/kg)
090616-1	Untreated Control	--	02-Aug-10	<LOD
090616-6	0.8	First commercial harvest	02-Aug-10	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.03 mg/kg for paraquat

LOD = Limit of Detection (as received basis) = 0.01 mg/kg for paraquat

Note: Results for test samples are not corrected for recoveries.

**Table 45 Residues of Paraquat in Cauliflower Treated with GRAMOXONE 250 via Field Trial 090617, Bathurst NSW**

Sample No.	Treatment Rate (L/ha)	Sampling Timing	Sampling Date	Paraquat (mg/kg)
090617-1	Untreated Control	--	24-Aug-10	<LOD
090617-6	0.8	First commercial harvest	24-Aug-10	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.03 mg/kg for paraquat

LOD = Limit of Detection (as received basis) = 0.01 mg/kg for paraquat

Note: Results for test samples are not corrected for recoveries.

**Table 46 Residues of Paraquat in Cauliflower Treated with GRAMOXONE 250 via Field Trial 090618, Werribee, Vic**

Sample No.	Treatment Rate (L/ha)	Sampling Timing	Sampling Date	Paraquat (mg/kg)
090618-1	Untreated Control	--	24-May-10	<LOD
090618-6	0.8	First commercial harvest	24-May-10	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.03 mg/kg for paraquat

LOD = Limit of Detection (as received basis) = 0.01 mg/kg for paraquat

Note: Results for test samples are not corrected for recoveries.

**Table 47 Residues of Paraquat in Brussels Sprouts Treated with GRAMOXONE 250 via Field Trial 090619, Coldstream, Vic**

Sample No.	Treatment Rate (L/ha)	Sampling Timing	Sampling Date	Paraquat (mg/kg)
090619-1	Untreated Control	--	05-Jul-10	<LOD
090619-6	0.8	First commercial harvest	05-Jul-10	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.03 mg/kg for paraquat

LOD = Limit of Detection (as received basis) = 0.01 mg/kg for paraquat

Note: Results for test samples are not corrected for recoveries.

**Table 48 Residues of Paraquat in Broccoli Treated with GRAMOXONE 250 via Field Trial 090620, Forth, Tas**

Sample No.	Treatment Rate (L/ha)	Sampling Timing	Sampling Date	Paraquat (mg/kg)
090620-1	Untreated Control	--	02-Jun-10	<LOD
090620-6	0.8	First commercial harvest	02-Jun-10	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.03 mg/kg for paraquat

LOD = Limit of Detection (as received basis) = 0.01 mg/kg for paraquat

Note: Results for test samples are not corrected for recoveries.

**Table 49 Residues of Paraquat in Brussels Sprouts Treated with GRAMOXONE 250 via Field Trial 090621, Nairne, SA**

Sample No.	Treatment Rate (L/ha)	Sampling Timing	Sampling Date	Paraquat (mg/kg)
090621-1	Untreated Control	--	23-Jun-10	<LOD
090621-6	0.8	First commercial harvest	23-Jun-10	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.03 mg/kg for paraquat

LOD = Limit of Detection (as received basis) = 0.01 mg/kg for paraquat

Note: Results for test samples are not corrected for recoveries.

**Table 50 Residues of Paraquat in Cauliflower Treated with GRAMOXONE 250 via Field Trial 090622, Manjimup, WA**

Sample No.	Treatment Rate (L/ha)	Sampling Timing	Sampling Date	Paraquat (mg/kg)
090622-1	Untreated Control	--	02-Jun-10	<LOD
090622-6	0.8	First commercial harvest	02-Jun-10	<LOD

LOQ = Limit of Quantitation (as received basis) = 0.03 mg/kg for paraquat

LOD = Limit of Detection (as received basis) = 0.01 mg/kg for paraquat

Note: Results for test samples are not corrected for recoveries.

## 6. DISCUSSION

Trial data from eight sites across Australia confirmed the earlier findings that broadleaf rather than grass weeds represent the largest threat to vegetable brassica growers. In these studies over 22 different broadleaf weeds were present with *Stellaria media*, *Sonchus oleraceus*, *Chenopodium album* and *Malva parviflora* being the most ubiquitous.

Effective weed control in vegetable brassicas is best obtained when an integrated weed control program is followed. Whilst discussion of integrated systems is beyond the scope of this report, considerations of the need for an integrated system have been made in evaluating the results from the weed control strategies evaluated.

The application of BARON WP herbicide as a broadcast treatment has been shown to be a very effective tool which can be successfully used in broadleaf weed control when applied as a broadcast spray within 3 days following transplanting as per the label recommendations. The data, particularly from the Mangrove Mountain study clearly demonstrate the benefit of combining the application of BARON WP with a suitable pre-emergence herbicide such as DUAL GOLD. **This program should form the basis of an effective chemical weed control strategy for vegetable brassica growers.**

The pre-emergence herbicides, DUAL GOLD and RIFLE 330 were used in all studies. These treatments were effective and generally safe to the crop in most instances. This was not the case in the Gatton study however, where plant growth was significantly retarded by the application of DUAL GOLD. The inclusion of the BARON WP treatments caused no greater crop damage than was seen to be caused by the DUAL GOLD alone. Whilst the crop in this location was successfully harvested the actual harvest date was delayed by some considerable time. The application of DUAL GOLD can have a significant impact on crops grown in these high clay content soils and should be avoided. The application of pendimethalin (RIFLE 330) applied prior to transplanting would be a preferred option in these conditions.

Investigation of the benefits of applying BARON WP at 3-4 weeks following transplanting demonstrated no difference over and above applying BARON WP immediately following transplanting. Whilst data were not always statistically significant, a trend in the data suggested that leaving applications until this timing may result in poorer weed control as BARON WP essentially has pre-emergence weed control activity. Using BARON WP as a follow up treatment at low rates as either an over the top application or as an inter-row treatment was shown to have some merit, and in terms of crop safety, was similar to BARON WP applied at the early post-transplant timing. For example at Bathurst and Mangrove Mountain, in broccoli and cauliflower, the data suggested that control of the weed *Stellaria media* was improved by a split application of BARON WP following use of the pre-emergence herbicide DUAL GOLD. At Coldstream when applied to Brussels sprouts the split application caused a significant reduction in crop biomass compared to untreated plots whereas the single application applied at transplanting did not. Longer residual weed control may result from this application program, but to be effective, it was shown that the product would need to be applied to weed free soil. The use of BARON WP alone to achieve later post-emergence weed control cannot be supported.

The herbicide FRONTIER-P (dimethenamid-P) was also evaluated as an alternative to the currently used pre-emergence herbicides. Whilst effective weed control was achieved, data indicated that performance was generally less than that provided by the current standards where applied alone or in a program with BARON WP. In addition, some crop safety issues were identified with FRONTIER-P generally showing a lower level of selectivity than the current standards and as such cannot be recommended for further development.

The use of hand weeding or simulated mechanical weeding was shown to provide a variable level of weed control across the trial locations. This was mainly due to the timing of the weed control, the weeds present and the location of the weeds in the planting architecture. The effectiveness of all of the currently registered pre-emergence herbicides can be reduced when inter-row cultivation is practised. The majority of these herbicides form a protective barrier on the soil surface which can be broken by cultivation and allow weeds to successfully germinate. However inter-row cultivation cannot be discounted from vegetable brassica agronomy, for as well as providing an alternative form of weed control, soil aeration is essential in some areas for best crop growth to be achieved. This was particularly apparent in the Bathurst study. The field trial area was not cultivated for the reasons stated whilst the remainder of the crop was. Plants in the test area failed to reach the same potential as the bulk of the crop and head size was significantly smaller.

The need to control broadleaf weeds which 'escape' early weed control strategies was further addressed through the use of the non-selective knockdown herbicides glufosinate-ammonium (BASTA), carfentrazone-ethyl (SPOTLIGHT PLUS) and paraquat (GRAMOXONE 250) as well as BARON WP through shrouded sprayers. BARON WP applied through a shrouded sprayer as an alternative to applying the treatment 'over the top' would be effective. Application rates of 150-500 g/ha were safe but generally were no better than when BARON WP was applied at transplanting.

The use of BASTA (glufosinate-ammonium) and SPOTLIGHT PLUS (carfentrazone-ethyl) applied via this technique all gave effective weed control and will offer an alternative to residual herbicides or cultivation. However, the major concern is with spray drift escaping from the unit and causing damage to the off-target crop. A purpose built unit was used in all trials to simulate commercial application and is shown in Figure 1.

A level of crop phytotoxicity was seen in all trials but varied between locations. Further, a high level of variability was seen within treatments in some trials and was a reflection of the low tolerance to drift when spraying on uneven surfaces with such an application method. General damage was greatest at 7 days following application and was evident as spotting on the outer leaves. SPOTLIGHT PLUS and GRAMOXONE generally caused a significantly higher level of damage than BASTA, which was particularly evident at Mangrove Mountain where significant spray escape occurred. Phytotoxic symptoms disappeared over time and generally did not have a long term impact upon harvestable produce. However vegetable brassica growers have a low tolerance to herbicide effects as the appearance of the produce is a critical determinant of marketability. For this reason the application of these treatments, particularly SPOTLIGHT PLUS and GRAMOXONE are considered very high risk.

When tank-mixed with BARON WP however phytotoxic symptoms were often greater than with each of the knockdown herbicides applied alone and longer term reductions in crop vigour also were evident and generally significantly greater than when each of the products were applied alone. A tank mix of BARON WP plus either BASTA, SPOTLIGHT PLUS or GRAMOXONE 250 cannot be recommended for further evaluation due to the high risk of a significant level of crop damage occurring.

GRAMOXONE 250 currently has a registration for use via shielded equipment in vegetables and could be used as a salvage treatment where equipment is available.

The development of an effective shrouded sprayer for use in vegetable brassicas is essential for this method of weed control to be adopted.

The importance of incorporating oxyfluorfen within 7 days of application was also investigated with the inclusion of demonstration sites at five locations. Both BARON WP and GOAL were applied at 2-3 days following transplanting and one section irrigated and one left with hand watering around the base of the plants. Differences in weed control were seen in three of the sites and were shown to growers at each of the field days to demonstrate the effect.

**Figure 1 Shrouded Spray Unit**



## **7. TECHNOLOGY TRANSFER**

### **7.1 Field Days**

Field days were conducted at each of the eight sites across Australia. Two separate days were generally conducted at each site one targeting industry representatives and one targeting growers. Field days were attended by a range of agronomists and field staff representing resellers, processors and chemical manufacturers as well as other researchers.

Data generated from this project will be used in product registrations for some actives and as such will not occur for some time following the projects completion. Companies whose products have been included in the study have been regularly consulted throughout the course of the project and will be involved in technology transfer following product registration which result from this work.

### **7.2 Grower Resource Pack**

The grower resource pack which has been generated as part of this project will provide the basis for integrated weed control measures in these crops. The grower resource pack is presented as a comprehensive brochure covering all aspects of brassica production including crop planning, crop production and post-harvest activities to ensure best possible outcomes for weed control are achieved. Any future measures which may be adopted from this project will need to be incorporated into the document at a later date.

In addition, a poster highlighting the importance of sprayer hygiene and how best to achieve this has been produced.

Both articles have been provided to HAL as attachments to this report and are publicly available through the Ausveg website at <http://ausveg.com.au/intranet/technical-insights/overview.htm> or by contacting the author at [les.mitchell@agriseach.com.au](mailto:les.mitchell@agriseach.com.au).

A range of other written material was produced including milestone reports and articles for magazines.



Date	Grower Field Day
19 March 2010	Gatton
25 June 2010	Gosford
23 April 2010	Bathurst
15 March 2010	Yarra Glen
31 March 2010	Werribee
7 May 2010	Devonport
18 January 2010	Adelaide Hills
15 April 2010	Manjimup
	Industry field days
18 March 2010	Gatton
18 March 2010	Yarra Glen
30 March 2010	Werribee
18 April 2010	Nairne
	Industry meetings
October/November 2009	Meetings with AgAware consulting, Agnova Technologies, Bayer CropScience and FMC Australia discussing project design
March 2101	Meetings with Agnova Technologies and FMC Australia discussing progress and development options
March 2011	Meetings with Agnova Technologies and Bayer crop science re registration options
March 2011	Meeting with Syngenta regarding current registration status

Attendance at the field days varied from 2-25 growers and industry and 1-2 at industry field days.

**Figure 2 Field Day Werribee**





## **8. RECOMMENDATIONS**

The major outcome of this project is that speculation over the use of BARON WP as a later post-emergence product in vegetable brassicas has been clarified. The study results demonstrate that when used according to label recommendations in conjunction with a registered transplant herbicide excellent weed control can be achieved. Later application uses will offer no significant benefit to the current registered practices and may lead to herbicide soil residue issues which are also addressed on the product label.

Sufficient data have been generated to support the registration application of BASTA for use as a salvage product using shrouded spray equipment and has shown that GRAMOXONE 250, which is registered for this application, can also be used. However any such commercial usage is contingent upon the development of an effective shrouded sprayer being available.

These two applications however are only part of an integrated approach which is required to achieve sustainable weed control in vegetable brassica production and a grower resource pack has been developed to provide essential information into achieving this result.

Comments from field days indicated surprise at the level of crop safety seen in all studies. In the absence of other explanations; sprayer hygiene and accurate calibration have been identified as an issue to ensure better pesticide efficiency with improved crop safety.

A program to improve understanding of the need for first class hygiene when using the same spray unit for applying different pesticide types is recommended.

## **9. ACKNOWLEDGMENTS**

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## **10. BIBLIOGRAPHY OF LITERATURE CITED**

Philip Frost et al – ‘Weed Management in Vegetable Brassicas’. Horticulture Australia Report VG098107, December 31 2002.

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## 11. APPENDICES

### 11.1 Full Results - Project Component 1 – Herbicide Strategies

#### 11.1.1 Trial 1, Gatton, Qld, Broccoli - Black Pigweed (*Trianthema portulacastrum*) Percentage Weed Control

Treatment	Application Timing	Rate Product/ha	Rep	29 DAT 11-Mar-10	37 DAT 19-Mar-10	50 DAT 01-Apr-10
1. Cultivation	Pre-plant		1	0.00	0.00	0.00
			2	0.00	0.00	0.00
			3	0.00	0.00	0.00
			Mean	0.00	0.00	0.00
2. Cultivation Hand Weeding	Pre-plant		1	100.00	100.00	90.00
	Post-plant		2	90.00	100.00	100.00
			3	90.00	100.00	100.00
			Mean	93.33	100.00	96.67
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant		1	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	95.00	90.00	100.00
	3 DAT	1000 g/ha	3	90.00	85.00	100.00
			Mean	95.00	91.67	100.00
4. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	90.00	100.00
			Mean	100.00	96.67	100.00
5. Cultivation DUAL GOLD BARON WP	Pre-plant		1	90.00	90.00	95.00
	0 DAT	2000 mL/ha	2	90.00	90.00	95.00
	3 WAT	500 g/ha	3	85.00	95.00	95.00
			Mean	88.33	91.67	95.00
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00
	3 WAT	150 g/ha	Mean	100.00	100.00	100.00
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00
	3 WAT	250 g/ha	Mean	100.00	100.00	100.00
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00
	3 WAT	150 g/ha (shielded)	Mean	100.00	100.00	100.00
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00
	3 WAT	250 g/ha (shielded)	Mean	100.00	100.00	100.00
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00
	3 WAT	500 g/ha (shielded)	Mean	100.00	100.00	100.00
11. Cultivation FRONTIER-P	Pre-plant		1	70.00	40.00	30.00
	0 DAT	700 mL/ha	2	95.00	50.00	30.00
			3	80.00	40.00	60.00
			Mean	81.67	43.33	40.00
12. Cultivation FRONTIER-P	Pre-plant		1	80.00	50.00	50.00
	0 DAT	1000 mL/ha	2	80.00	50.00	40.00
			3	90.00	60.00	70.00
			Mean	83.33	53.33	53.33
13. Cultivation FRONTIER-P BARON WP	Pre-plant		1	100.00	95.00	100.00
	0 DAT	700 mL/ha	2	95.00	95.00	100.00
	3 DAT	1000 g/ha	3	100.00	75.00	90.00
			Mean	98.33	88.33	96.67

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.2 Trial 1, Gatton, Qld, Broccoli - Sowthistle (*Sonchus oleraceus*) Percentage Weed Control

Treatment	Application Timing	Rate Product/ha	Rep	29 DAT 11-Mar-10	37 DAT 19-Mar-10	50 DAT 01-Apr-10
1. Cultivation	Pre-plant		1	0.00	0.00	0.00
			2	0.00	0.00	0.00
			3	0.00	0.00	0.00
			Mean	0.00	0.00	0.00
2. Cultivation Hand Weeding	Pre-plant		1	100.00	100.00	100.00
	Post-plant		2	100.00	100.00	90.00
			3	100.00	100.00	100.00
	Mean			100.00	100.00	96.67
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant		1	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00
	Mean			100.00	100.00	100.00
4. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00
	Mean			100.00	100.00	100.00
5. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00
	3 WAT	500 g/ha	3	100.00	100.00	100.00
	Mean			100.00	100.00	100.00
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00
	3 WAT	150 g/ha	Mean	100.00	100.00	100.00
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00
	3 WAT	250 g/ha	Mean	100.00	100.00	100.00
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00
	3 WAT	150 g/ha (shielded)	Mean	100.00	100.00	100.00
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00
	3 WAT	250 g/ha (shielded)	Mean	100.00	100.00	100.00
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00
	3 WAT	500 g/ha (shielded)	Mean	100.00	100.00	100.00
11. Cultivation FRONTIER-P	Pre-plant		1	100.00	100.00	100.00
	0 DAT	700 mL/ha	2	100.00	95.00	90.00
			3	100.00	95.00	100.00
	Mean			100.00	96.67	96.67
12. Cultivation FRONTIER-P	Pre-plant		1	100.00	100.00	100.00
	0 DAT	1000 mL/ha	2	100.00	100.00	100.00
			3	100.00	100.00	100.00
	Mean			100.00	100.00	100.00
13. Cultivation FRONTIER-P BARON WP	Pre-plant		1	100.00	98.00	100.00
	0 DAT	700 mL/ha	2	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	95.00	90.00
	Mean			100.00	97.67	96.67

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.3 Trial 1, Gatton, Qld, Broccoli - Dwarf Amaranth (*Amaranthus macrocarpus*) Percentage Weed Control

Treatment	Application Timing	Rate Product/ha	Rep	29 DAT 11-Mar-10	37 DAT 19-Mar-10	50 DAT 01-Apr-10
1. Cultivation	Pre-plant		1	0.00	0.00	0.00
			2	0.00	0.00	0.00
			3	0.00	0.00	0.00
			Mean	0.00	0.00	0.00
2. Cultivation Hand Weeding	Pre-plant		1	90.00	100.00	100.00
			2	90.00	100.00	100.00
	Post-plant		3	100.00	100.00	100.00
			Mean	93.33	100.00	100.00
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant	2000 mL/ha	1	90.00	100.00	100.00
			2	100.00	100.00	100.00
		1000 g/ha	3	100.00	100.00	100.00
			Mean	96.67	100.00	100.00
4. Cultivation DUAL GOLD BARON WP	Pre-plant	2000 mL/ha	1	100.00	100.00	100.00
			2	100.00	100.00	100.00
		1000 g/ha	3	100.00	100.00	100.00
			Mean	100.00	100.00	100.00
5. Cultivation DUAL GOLD BARON WP	Pre-plant	2000 mL/ha	1	100.00	100.00	100.00
			2	100.00	100.00	100.00
		500 g/ha	3	100.00	100.00	100.00
			Mean	100.00	100.00	100.00
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha	1	100.00	100.00	100.00
			2	100.00	100.00	100.00
		1000 g/ha	3	100.00	100.00	100.00
			150 g/ha	Mean	100.00	100.00
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha	1	100.00	100.00	100.00
			2	100.00	100.00	100.00
		1000 g/ha	3	100.00	100.00	100.00
			250 g/ha	Mean	100.00	100.00
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha	1	100.00	100.00	100.00
			2	100.00	100.00	100.00
		1000 g/ha	3	100.00	100.00	100.00
			150 g/ha (shielded)	Mean	100.00	100.00
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha	1	100.00	100.00	100.00
			2	100.00	100.00	100.00
		1000 g/ha	3	100.00	100.00	100.00
			250 g/ha (shielded)	Mean	100.00	100.00
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha	1	90.00	100.00	100.00
			2	100.00	100.00	100.00
		1000 g/ha	3	100.00	100.00	100.00
			500 g/ha (shielded)	Mean	96.67	100.00
11. Cultivation FRONTIER-P	Pre-plant	700 mL/ha	1	95.00	90.00	100.00
			2	100.00	100.00	100.00
			3	90.00	95.00	100.00
			Mean	95.00	95.00	100.00
12. Cultivation FRONTIER-P	Pre-plant	1000 mL/ha	1	100.00	90.00	100.00
			2	95.00	100.00	100.00
			3	100.00	100.00	100.00
			Mean	98.33	96.67	100.00
13. Cultivation FRONTIER-P BARON WP	Pre-plant	700 mL/ha	1	100.00	100.00	100.00
			2	100.00	100.00	100.00
			3	100.00	100.00	100.00
			Mean	100.00	100.00	100.00

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.4 Trial 1, Gatton, Qld, Broccoli - Awnless Barnyard Grass (*Echinochloa crus-galli*) Percentage Weed Control

Treatment	Application Timing	Rate Product/ha	Rep	29 DAT 11-Mar-10	37 DAT 19-Mar-10	50 DAT 01-Apr-10
1. Cultivation	Pre-plant		1	0.00	0.00	0.00
			2	0.00	0.00	0.00
			3	0.00	0.00	0.00
			Mean	0.00	0.00	0.00
2. Cultivation Hand Weeding	Pre-plant		1	90.00	100.00	100.00
	Post-plant		2	95.00	100.00	90.00
			3	90.00	100.00	100.00
			Mean	91.67	100.00	96.67
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant		1	90.00	100.00	100.00
	0 DAT	2000 mL/ha	2	90.00	80.00	100.00
	3 DAT	1000 g/ha	3	90.00	90.00	100.00
			Mean	90.00	90.00	100.00
4. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	90.00	98.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00
			Mean	96.67	99.33	100.00
5. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00
	3 WAT	500 g/ha	3	95.00	95.00	100.00
			Mean	98.33	98.33	100.00
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	98.00	95.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00
	3 WAT	150 g/ha	Mean	100.00	99.33	98.33
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00
	3 WAT	250 g/ha	Mean	100.00	100.00	100.00
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00
	3 WAT	150 g/ha (shielded)	Mean	100.00	100.00	100.00
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00
	3 WAT	250 g/ha (shielded)	Mean	100.00	100.00	100.00
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	98.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00
	3 WAT	500 g/ha (shielded)	Mean	100.00	99.33	100.00
11. Cultivation FRONTIER-P	Pre-plant		1	95.00	90.00	90.00
	0 DAT	700 mL/ha	2	85.00	90.00	90.00
			3	100.00	100.00	100.00
			Mean	93.33	93.33	93.33
12. Cultivation FRONTIER-P	Pre-plant		1	100.00	100.00	100.00
	0 DAT	1000 mL/ha	2	95.00	90.00	90.00
			3	95.00	95.00	95.00
			Mean	96.67	95.00	95.00
13. Cultivation FRONTIER-P BARON WP	Pre-plant		1	100.00	100.00	100.00
	0 DAT	700 mL/ha	2	90.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00
			Mean	96.67	100.00	100.00

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.5 Trial 1, Gatton, Qld, Broccoli - Phytotoxicity (0 - 100 Scale)

Treatment	Application Timing	Rate Product/ha	Rep	29 DAT
1. Cultivation	Pre-plant		1	0.00
			2	0.00
			3	0.00
			Mean	0.00
2. Cultivation Hand Weeding	Pre-plant		1	0.00
	Post-plant		2	0.00
			3	0.00
	Mean		0.00	
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant	2000 mL/ha 1000 g/ha	1	0.00
	0 DAT		2	0.00
	3 DAT		3	0.00
	Mean		0.00	
4. Cultivation DUAL GOLD BARON WP	Pre-plant	2000 mL/ha 1000 g/ha	1	2.00
	0 DAT		2	2.00
	3 DAT		3	2.00
	Mean		2.00	
5. Cultivation DUAL GOLD BARON WP	Pre-plant	2000 mL/ha 500 g/ha	1	0.00
	0 DAT		2	0.00
	3 WAT		3	0.00
	Mean		0.00	
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 150 g/ha	1	3.00
	0 DAT		2	2.00
	3 DAT		3	3.00
	3 WAT		Mean	2.67
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 250 g/ha	1	3.00
	0 DAT		2	3.00
	3 DAT		3	3.00
	3 WAT		Mean	3.00
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 150 g/ha (shielded)	1	2.00
	0 DAT		2	2.00
	3 DAT		3	3.00
	3 WAT		Mean	2.33
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 250 g/ha (shielded)	1	3.00
	0 DAT		2	2.00
	3 DAT		3	3.00
	3 WAT		Mean	2.67
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 500 g/ha (shielded)	1	3.00
	0 DAT		2	2.00
	3 DAT		3	3.00
	3 WAT		Mean	2.67
11. Cultivation FRONTIER-P	Pre-plant	700 mL/ha	1	1.00
	0 DAT		2	2.00
			3	1.00
	Mean		1.33	
12. Cultivation FRONTIER-P	Pre-plant	1000 mL/ha	1	1.00
	0 DAT		2	1.00
			3	3.00
	Mean		1.67	
13. Cultivation FRONTIER-P BARON WP	Pre-plant	700 mL/ha 1000 g/ha	1	2.00
	0 DAT		2	1.00
	3 DAT		3	1.00
	Mean		1.33	

DAT - days after transplanting; WAT - weeks after transplanting



### 11.1.6 Trial 1, Gatton, Qld, Broccoli - Crop Vigour (0-100 Scale)

Treatment	Application Timing	Rate Product/ha	Rep	29 DAT 11-Mar-10	37 DAT 19-Mar-10	50 DAT 01-Apr-10
1. Cultivation	Pre-plant		1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
2. Cultivation Hand Weeding	Pre-plant		1	100.0	100.0	100.0
	Post-plant		2	100.0	100.0	100.0
			3	100.0	100.0	100.0
		Mean	100.0	100.0	100.0	
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant		1	90.0	80.0	90.0
	0 DAT	2000 mL/ha	2	95.0	80.0	75.0
	3 DAT	1000 g/ha	3	90.0	80.0	90.0
	Mean		Mean	91.7	80.0	85.0
4. Cultivation DUAL GOLD BARON WP	Pre-plant		1	90.0	80.0	90.0
	0 DAT	2000 mL/ha	2	90.0	80.0	85.0
	3 DAT	1000 g/ha	3	90.0	90.0	70.0
	Mean		Mean	90.0	83.3	81.7
5. Cultivation DUAL GOLD BARON WP	Pre-plant		1	95.0	80.0	80.0
	0 DAT	2000 mL/ha	2	95.0	90.0	85.0
	3 WAT	500 g/ha	3	80.0	70.0	75.0
	Mean		Mean	90.0	80.0	80.0
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	90.0	80.0	80.0
	0 DAT	2000 mL/ha	2	95.0	70.0	80.0
	3 DAT	1000 g/ha	3	95.0	80.0	80.0
	3 WAT	150 g/ha	Mean	93.3	76.7	80.0
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	90.0	80.0	80.0
	0 DAT	2000 mL/ha	2	95.0	90.0	90.0
	3 DAT	1000 g/ha	3	90.0	100.0	90.0
	3 WAT	250 g/ha	Mean	91.7	90.0	86.7
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	95.0	80.0	80.0
	0 DAT	2000 mL/ha	2	90.0	70.0	70.0
	3 DAT	1000 g/ha	3	90.0	80.0	100.0
	3 WAT	150 g/ha (shielded)	Mean	91.7	76.7	83.3
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	95.0	80.0	75.0
	0 DAT	2000 mL/ha	2	95.0	90.0	85.0
	3 DAT	1000 g/ha	3	90.0	90.0	90.0
	3 WAT	250 g/ha (shielded)	Mean	93.3	86.7	83.3
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	95.0	80.0	70.0
	0 DAT	2000 mL/ha	2	95.0	90.0	95.0
	3 DAT	1000 g/ha	3	90.0	90.0	90.0
	3 WAT	500 g/ha (shielded)	Mean	93.3	86.7	85.0
11. Cultivation FRONTIER-P	Pre-plant		1	90.0	90.0	80.0
	0 DAT	700 mL/ha	2	95.0	80.0	80.0
			3	90.0	70.0	70.0
	Mean		Mean	91.7	80.0	76.7
12. Cultivation FRONTIER-P	Pre-plant		1	90.0	80.0	70.0
	0 DAT	1000 mL/ha	2	90.0	70.0	70.0
			3	95.0	80.0	95.0
	Mean		Mean	91.7	76.7	78.3
13. Cultivation FRONTIER-P BARON WP	Pre-plant		1	70.0	60.0	60.0
	0 DAT	700 mL/ha	2	60.0	60.0	60.0
	3 DAT	1000 g/ha	3	70.0	60.0	40.0
	Mean		Mean	66.7	60.0	53.3

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.7 Trial 2, Mangrove Mountain, NSW, Broccoli - Weed Count at 27 DAT by Species per 1m<sup>2</sup>

Treatment	Application Timing	Rate Prod/ha	Rep	Potato Weed 16-Jun-10	Chickweed 16-Jun-10	Shepherd's Purse 16-Jun-10	Marshmallow 16-Jun-10	Winter Grass 16-Jun-10
1. Cultivation	Pre-plant		1	1.2	13.0	1.0	0.2	8.6
			2	1.8	5.2	1.2	0.2	6.2
			3	3.0	4.6	0.8	0.0	4.8
			Mean	2.0	7.6	1.0	0.1	6.5
2. Cultivation Hand Weeding	Pre-plant		1	0.8	8.0	0.8	0.0	5.8
	Post-plant		2	0.4	3.0	0.2	0.2	4.4
	3		1.0	4.2	0.6	0.2	6.6	
	Mean		0.7	5.1	0.5	0.1	5.6	
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant	2000 mL/ha 1000 g/ha	1	0.0	0.8	0.0	0.0	0.4
	0 DAT		2	0.0	1.2	0.0	0.0	0.0
	3 DAT		3	0.0	0.4	0.0	0.0	0.0
	Mean		0.0	0.8	0.0	0.0	0.1	
4. Cultivation DUAL GOLD BARON WP	Pre-plant	2000 mL/ha 1000 g/ha	1	0.0	0.2	0.0	0.0	0.0
	0 DAT		2	0.0	0.6	0.0	0.0	0.0
	3 DAT		3	0.0	1.0	0.0	0.0	0.0
	Mean		0.0	0.6	0.0	0.0	0.0	
5. Cultivation DUAL GOLD BARON WP	Pre-plant	2000 mL/ha 500 g/ha	1	0.0	0.0	0.0	0.0	1.0
	0 DAT		2	0.0	0.0	0.0	0.0	0.0
	3 WAT		3	0.0	0.0	0.0	0.0	0.0
	Mean		0.0	0.0	0.0	0.0	0.3	
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 150 g/ha	1	0.0	0.2	0.0	0.0	0.0
	0 DAT		2	0.0	0.4	0.0	0.0	0.0
	3 DAT		3	0.0	0.6	0.0	0.0	0.0
	3 WAT		Mean	0.0	0.4	0.0	0.0	0.0
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 250 g/ha	1	0.0	0.4	0.0	0.0	0.0
	0 DAT		2	0.0	1.2	0.0	0.0	0.0
	3 DAT		3	0.0	0.4	0.0	0.0	0.0
	3 WAT		Mean	0.0	0.7	0.0	0.0	0.0
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 150 g/ha (shielded)	1	0.0	0.0	0.0	0.0	0.2
	0 DAT		2	0.0	1.4	0.0	0.0	0.4
	3 DAT		3	0.0	0.2	0.0	0.0	0.0
	3 WAT		Mean					
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 250 g/ha (shielded)	1	0.0	0.2	0.0	0.0	0.2
	0 DAT		2	0.0	0.6	0.0	0.0	0.2
	3 DAT		3	0.0	0.2	0.0	0.0	0.0
	3 WAT		Mean	0.0	0.3	0.0	0.0	0.1
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 500 g/ha (shielded)	1	0.0	0.2	0.0	0.0	0.0
	0 DAT		2	0.0	0.4	0.0	0.0	0.0
	3 DAT		3	0.0	0.4	0.0	0.0	0.0
	3 WAT		Mean	0.0	0.3	0.0	0.0	0.0
11. Cultivation BARON WP	Pre-plant	500 g/ha	1	0.0	7.8	0.0	0.0	0.0
	3 DAT		2	0.0	6.4	0.0	0.0	0.6
	3		0.0	5.6	0.0	0.0	0.0	
	Mean		0.0	6.6	0.0	0.0	0.2	
12. Cultivation BARON WP	Pre-plant	1000 g/ha	1	0.0	5.0	0.0	0.0	0.0
	3 DAT		2	0.0	4.4	0.0	0.0	0.0
	3		0.0	3.4	0.0	0.0	0.0	
	Mean		0.0	4.3	0.0	0.0	0.0	

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.8 Trial 2, Mangrove Mountain, NSW, Broccoli - Potato Weed (*Galinsoga parviflora*) Percentage Weed Control

Treatment	Application Timing	Rate Prod/ha	Rep	35 DAT 01-Jun-10	50 DAT 16-Jun-10	73 DAT 09-Jul-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0
			2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	0.0	20.0	10.0
	Post-plant		2	0.0	20.0	10.0
			3	0.0	20.0	10.0
		Mean	0.0	20.0	10.0	
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant		1	100.0	100.0	95.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0
	Mean			100.0	100.0	98.3
4. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	99.0	100.0	100.0
	Mean			99.7	100.0	100.0
5. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0
	3 WAT	500 g/ha	3	100.0	100.0	100.0
	Mean			100.0	100.0	100.0
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0
	3 WAT	150 g/ha	Mean	100.0	100.0	100.0
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0
	3 WAT	250 g/ha	Mean	100.0	100.0	100.0
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0
	3 WAT	150 g/ha (shielded)	Mean	100.0	100.0	100.0
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0
	3 WAT	250 g/ha (shielded)	Mean	100.0	100.0	100.0
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0
	3 WAT	500 g/ha (shielded)	Mean	100.0	100.0	100.0
11. Cultivation BARON WP	Pre-plant		1	100.0	100.0	100.0
	3 DAT	500 g/ha	2	95.0	100.0	100.0
			3	70.0	100.0	100.0
			Mean	88.3	100.0	100.0
12. Cultivation BARON WP	Pre-plant		1	100.0	100.0	100.0
	3 DAT	1000 g/ha	2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.9 Trial 2, Mangrove Mountain, NSW, Broccoli - Chickweed (*Stellaria media*) Percentage Weed Control

Treatment	Application Timing	Rate Prod/ha	Rep	35 DAT 01-Jun-10	50 DAT 16-Jun-10	73 DAT 09-Jul-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0
			2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	0.0	20.0	10.0
	Post-plant		2	0.0	30.0	15.0
			3	0.0	20.0	10.0
		Mean	0.0	23.3	11.7	
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant		1	98.0	99.0	90.0
	0 DAT	2000 mL/ha	2	95.0	99.0	93.0
	3 DAT	1000 g/ha	3	90.0	95.0	93.0
	Mean		94.3	97.7	92.0	
4. Cultivation DUAL GOLD BARON WP	Pre-plant		1	98.0	99.0	90.0
	0 DAT	2000 mL/ha	2	98.0	99.0	97.0
	3 DAT	1000 g/ha	3	98.0	90.0	93.0
	Mean		98.0	96.0	93.3	
5. Cultivation DUAL GOLD BARON WP	Pre-plant		1	99.0	99.0	95.0
	0 DAT	2000 mL/ha	2	99.0	99.0	98.0
	3 WAT	500 g/ha	3	99.0	99.0	99.0
	Mean		99.0	99.0	97.3	
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	99.0	99.0	97.0
	0 DAT	2000 mL/ha	2	99.0	98.0	95.0
	3 DAT	1000 g/ha	3	98.0	99.0	96.0
	3 WAT	150 g/ha	Mean	98.7	98.7	96.0
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	99.0	99.0	97.0
	0 DAT	2000 mL/ha	2	99.0	99.0	96.0
	3 DAT	1000 g/ha	3	99.0	99.0	98.0
	3 WAT	250 g/ha	Mean	99.0	99.0	97.0
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	99.0	99.0	97.0
	0 DAT	2000 mL/ha	2	95.0	48.0	90.0
	3 DAT	1000 g/ha	3	99.0	98.0	95.0
	3 WAT	150 g/ha (shielded)	Mean	97.7	81.7	94.0
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	97.0	99.0	95.0
	0 DAT	2000 mL/ha	2	97.0	99.0	93.0
	3 DAT	1000 g/ha	3	99.0	99.0	98.0
	3 WAT	250 g/ha (shielded)	Mean	97.7	99.0	95.3
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	99.0	98.0	97.0
	0 DAT	2000 mL/ha	2	99.0	99.0	97.0
	3 DAT	1000 g/ha	3	99.0	99.0	98.0
	3 WAT	500 g/ha (shielded)	Mean	99.0	98.7	97.3
11. Cultivation BARON WP	Pre-plant		1	5.0	5.0	10.0
	3 DAT	500 g/ha	2	10.0	20.0	7.0
			3	20.0	10.0	0.0
			Mean	11.7	11.7	5.7
12. Cultivation BARON WP	Pre-plant		1	70.0	40.0	65.0
	3 DAT	1000 g/ha	2	50.0	50.0	20.0
			3	70.0	30.0	10.0
			Mean	63.3	40.0	31.7

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.10 Trial 2, Mangrove Mountain, NSW, Broccoli - Shepherd's Purse (*Capsella bursa-pastoris*) Percentage Weed Control

Treatment	Application Timing	Rate Prod/ha	Rep	35 DAT 01-Jun-10	50 DAT 16-Jun-10	73 DAT 09-Jul-10		
1. Cultivation	Pre-plant		1	0.0	0.0	0.0		
			2	0.0	0.0	0.0		
			3	0.0	0.0	0.0		
			Mean	0.0	0.0	0.0		
2. Cultivation Hand Weeding	Pre-plant		1	0.0	20.0	10.0		
	Post-plant		2	0.0	50.0	30.0		
			3	0.0	20.0	20.0		
		Mean	0.0	30.0	20.0			
3. Cultivation	Pre-plant	2000 mL/ha 1000 g/ha	1	100.0	100.0	100.0		
			DUAL GOLD	0 DAT	2	100.0	100.0	100.0
			BARON WP	3 DAT	3	100.0	100.0	100.0
			Inter-row cultivation	Mean	100.0	100.0	100.0	
4. Cultivation	Pre-plant	2000 mL/ha 1000 g/ha	1	100.0	100.0	100.0		
			DUAL GOLD	0 DAT	2	100.0	100.0	100.0
			BARON WP	3 DAT	3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0		
5. Cultivation	Pre-plant	2000 mL/ha 500 g/ha	1	100.0	100.0	100.0		
			DUAL GOLD	0 DAT	2	100.0	100.0	100.0
			BARON WP	3 WAT	3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0		
6. Cultivation	Pre-plant	2000 mL/ha 1000 g/ha 150 g/ha	1	100.0	100.0	100.0		
			DUAL GOLD	0 DAT	2	100.0	100.0	100.0
			BARON WP	3 DAT	3	100.0	100.0	100.0
			BARON WP	3 WAT	Mean	100.0	100.0	100.0
7. Cultivation	Pre-plant	2000 mL/ha 1000 g/ha 250 g/ha	1	100.0	100.0	100.0		
			DUAL GOLD	0 DAT	2	100.0	100.0	100.0
			BARON WP	3 DAT	3	100.0	100.0	100.0
			BARON WP	3 WAT	Mean	100.0	100.0	100.0
8. Cultivation	Pre-plant	2000 mL/ha 1000 g/ha 150 g/ha (shielded)	1	100.0	100.0	100.0		
			DUAL GOLD	0 DAT	2	100.0	100.0	100.0
			BARON WP	3 DAT	3	100.0	100.0	100.0
			BARON WP	3 WAT	Mean	100.0	100.0	100.0
9. Cultivation	Pre-plant	2000 mL/ha 1000 g/ha 250 g/ha (shielded)	1	100.0	100.0	100.0		
			DUAL GOLD	0 DAT	2	100.0	100.0	100.0
			BARON WP	3 DAT	3	100.0	100.0	100.0
			BARON WP	3 WAT	Mean	100.0	100.0	100.0
10. Cultivation	Pre-plant	2000 mL/ha 1000 g/ha 500 g/ha (shielded)	1	100.0	100.0	100.0		
			DUAL GOLD	0 DAT	2	100.0	100.0	100.0
			BARON WP	3 DAT	3	100.0	100.0	100.0
			BARON WP	3 WAT	Mean	100.0	100.0	100.0
11. Cultivation	Pre-plant	500 g/ha	1	100.0	100.0	80.0		
			BARON WP	3 DAT	2	100.0	100.0	100.0
					3	100.0	100.0	100.0
			Mean	100.0	100.0	93.3		
12. Cultivation	Pre-plant	1000 g/ha	1	100.0	100.0	100.0		
			BARON WP	3 DAT	2	100.0	100.0	100.0
					3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0		

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.11 Trial 2, Mangrove Mountain, NSW, Broccoli - Marshmallow (*Malva parviflora*) Percentage Weed Control

Treatment	Application Timing	Rate Prod/ha	Rep	35 DAT 01-Jun-10	50 DAT 16-Jun-10	73 DAT 09-Jul-10			
1. Cultivation	Pre-plant		1	0.0	0.0	0.0			
			2	0.0	0.0	0.0			
			3	0.0	0.0	0.0			
			Mean	0.0	0.0	0.0			
2. Cultivation Hand Weeding	Pre-plant		1	0.0	20.0	10.0			
	Post-plant		2	0.0	0.0	60.0			
			3	0.0	0.0	10.0			
		Mean	0.0	6.7	26.7				
3. Cultivation	Pre-plant		1	100.0	100.0	100.0			
			DUAL GOLD	0 DAT	2000 mL/ha	2	100.0	100.0	100.0
			BARON WP	3 DAT	1000 g/ha	3	100.0	100.0	100.0
			Inter-row cultivation	Mean	100.0	100.0	100.0		
4. Cultivation	Pre-plant		1	100.0	100.0	100.0			
			DUAL GOLD	0 DAT	2000 mL/ha	2	100.0	100.0	100.0
			BARON WP	3 DAT	1000 g/ha	3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0			
5. Cultivation	Pre-plant		1	100.0	100.0	100.0			
			DUAL GOLD	0 DAT	2000 mL/ha	2	100.0	100.0	100.0
			BARON WP	3 WAT	500 g/ha	3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0			
6. Cultivation	Pre-plant		1	100.0	100.0	100.0			
			DUAL GOLD	0 DAT	2000 mL/ha	2	100.0	100.0	100.0
			BARON WP	3 DAT	1000 g/ha	3	100.0	100.0	100.0
			BARON WP	3 WAT	150 g/ha	Mean	100.0	100.0	100.0
7. Cultivation	Pre-plant		1	100.0	100.0	100.0			
			DUAL GOLD	0 DAT	2000 mL/ha	2	100.0	100.0	100.0
			BARON WP	3 DAT	1000 g/ha	3	100.0	100.0	100.0
			BARON WP	3 WAT	250 g/ha	Mean	100.0	100.0	100.0
8. Cultivation	Pre-plant		1	100.0	100.0	100.0			
			DUAL GOLD	0 DAT	2000 mL/ha	2	100.0	100.0	100.0
			BARON WP	3 DAT	1000 g/ha	3	100.0	100.0	100.0
			BARON WP	3 WAT	150 g/ha (shielded)	Mean	100.0	100.0	100.0
9. Cultivation	Pre-plant		1	100.0	100.0	100.0			
			DUAL GOLD	0 DAT	2000 mL/ha	2	100.0	100.0	100.0
			BARON WP	3 DAT	1000 g/ha	3	100.0	100.0	100.0
			BARON WP	3 WAT	250 g/ha (shielded)	Mean	100.0	100.0	100.0
10. Cultivation	Pre-plant		1	100.0	100.0	100.0			
			DUAL GOLD	0 DAT	2000 mL/ha	2	100.0	100.0	100.0
			BARON WP	3 DAT	1000 g/ha	3	100.0	100.0	100.0
			BARON WP	3 WAT	500 g/ha (shielded)	Mean	100.0	100.0	100.0
11. Cultivation	Pre-plant		1	100.0	100.0	100.0			
			BARON WP	3 DAT	500 g/ha	2	100.0	100.0	100.0
						3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0			
12. Cultivation	Pre-plant		1	100.0	100.0	100.0			
			BARON WP	3 DAT	1000 g/ha	2	100.0	100.0	100.0
						3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0			

DAT - days after transplanting; WAT - weeks after transplanting

**11.1.12 Trial 2, Mangrove Mountain, NSW, Broccoli - Winter Grass (*Poa annua*)  
Percentage Weed Control**

Treatment	Application Timing	Rate Prod/ha	Rep	35 DAT 01-Jun-10	50 DAT 16-Jun-10	73 DAT 09-Jul-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0
			2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	0.0	20.0	10.0
	Post-plant		2	0.0	20.0	0.0
			3	0.0	10.0	0.0
		Mean	0.0	16.7	3.3	
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant		1	98.0	99.0	95.0
	0 DAT	2000 mL/ha	2	98.0	100.0	95.0
	3 DAT	1000 g/ha	3	100.0	99.0	99.0
	Mean		98.7	99.3	96.3	
4. Cultivation DUAL GOLD BARON WP	Pre-plant		1	99.0	99.0	95.0
	0 DAT	2000 mL/ha	2	99.0	99.0	98.0
	3 DAT	1000 g/ha	3	99.0	100.0	98.0
	Mean		99.0	99.3	97.0	
5. Cultivation DUAL GOLD BARON WP	Pre-plant		1	97.0	98.0	90.0
	0 DAT	2000 mL/ha	2	99.0	100.0	99.0
	3 WAT	500 g/ha	3	100.0	100.0	99.0
	Mean		98.7	99.3	96.0	
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	99.0	100.0	95.0
	0 DAT	2000 mL/ha	2	99.0	100.0	97.0
	3 DAT	1000 g/ha	3	100.0	100.0	99.0
	3 WAT	150 g/ha	Mean	99.3	100.0	97.0
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	99.0	99.0	97.0
	0 DAT	2000 mL/ha	2	99.0	99.0	98.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0
	3 WAT	250 g/ha	Mean	99.3	99.3	98.3
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	99.0	99.0	97.0
	0 DAT	2000 mL/ha	2	98.0	99.0	95.0
	3 DAT	1000 g/ha	3	99.0	99.0	95.0
	3 WAT	150 g/ha (shielded)	Mean	98.7	99.0	95.7
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	99.0	99.0	97.0
	0 DAT	2000 mL/ha	2	97.0	100.0	98.0
	3 DAT	1000 g/ha	3	99.0	100.0	100.0
	3 WAT	250 g/ha (shielded)	Mean	98.3	99.7	98.3
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	99.0	99.0	99.0
	0 DAT	2000 mL/ha	2	100.0	100.0	99.0
	3 DAT	1000 g/ha	3	100.0	100.0	99.0
	3 WAT	500 g/ha (shielded)	Mean	99.7	99.7	99.0
11. Cultivation BARON WP	Pre-plant		1	100.0	100.0	80.0
	3 DAT	500 g/ha	2	60.0	90.0	90.0
			3	70.0	99.0	75.0
			Mean	76.7	96.3	81.7
12. Cultivation BARON WP	Pre-plant		1	100.0	100.0	95.0
	3 DAT	1000 g/ha	2	99.0	100.0	99.0
			3	99.0	100.0	99.0
			Mean	99.3	100.0	97.7

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.13 Trial 2, Mangrove Mountain, NSW, Broccoli - Crop Vigour Scale (0-100)

Treatment	Application Timing	Rate Prod/ha	Rep	35 DAT 01-Jun-10	50 DAT 16-Jun-10	73 DAT 09-Jul-10
1. Cultivation	Pre-plant		1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
2. Cultivation Hand Weeding	Pre-plant		1	100.0	100.0	100.0
			2	100.0	100.0	100.0
	Post-plant		3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant	2000 mL/ha 1000 g/ha	1	90.0	100.0	100.0
			2	95.0	95.0	100.0
			3	90.0	100.0	100.0
			Mean	91.7	98.3	100.0
4. Cultivation DUAL GOLD BARON WP	Pre-plant	2000 mL/ha 1000 g/ha	1	90.0	100.0	95.0
			2	95.0	100.0	95.0
			3	100.0	100.0	100.0
			Mean	95.0	100.0	96.7
5. Cultivation DUAL GOLD BARON WP	Pre-plant	2000 mL/ha 500 g/ha	1	90.0	100.0	95.0
			2	90.0	95.0	85.0
			3	90.0	95.0	90.0
			Mean	90.0	96.7	90.0
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 150 g/ha	1	80.0	95.0	95.0
			2	90.0	95.0	90.0
			3	100.0	95.0	97.0
			Mean	90.0	95.0	94.0
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 250 g/ha	1	80.0	95.0	100.0
			2	90.0	90.0	90.0
			3	95.0	98.0	100.0
			Mean	88.3	94.3	96.7
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 150 g/ha (shielded)	1	85.0	100.0	95.0
			2	100.0	100.0	100.0
			3	95.0	100.0	100.0
			Mean	93.3	100.0	98.3
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 250 g/ha (shielded)	1	85.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	98.0	100.0
			Mean	95.0	99.3	100.0
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 500 g/ha (shielded)	1	95.0	98.0	90.0
			2	80.0	95.0	90.0
			3	95.0	95.0	97.0
			Mean	90.0	96.0	92.3
11. Cultivation BARON WP	Pre-plant	500 g/ha	1	100.0	100.0	95.0
			2	100.0	100.0	95.0
			3	100.0	95.0	100.0
			Mean	100.0	98.3	96.7
12. Cultivation BARON WP	Pre-plant	1000 g/ha	1	95.0	95.0	90.0
			2	90.0	100.0	97.0
			3	100.0	100.0	95.0
			Mean	95.0	98.3	94.0

DAT - days after transplanting; WAT - weeks after transplanting



### 11.1.14 Trial 2, Mangrove Mountain, NSW, Broccoli - Percentage Phytotoxicity

Treatment	Application Timing	Rate Prod/ha	Rep	35 DAT 01-Jun-10	50 DAT 16-Jun-10	73 DAT 09-Jul-10	
1. Cultivation	Pre-plant		1	0.0	0.0	0.0	
			2	0.0	0.0	0.0	
			3	0.0	0.0	0.0	
			Mean	0.0	0.0	0.0	
2. Cultivation Hand Weeding	Pre-plant		1	0.0	0.0	0.0	
	Post-plant		2	0.0	0.0	0.0	
			3	0.0	0.0	0.0	
			Mean	0.0	0.0	0.0	
3. Cultivation	Pre-plant	2000 mL/ha 1000 g/ha	1	0.0	0.0	0.0	
			DUAL GOLD 0 DAT	2	0.0	0.0	0.0
			BARON WP 3 DAT	3	0.0	0.0	0.0
			Inter-row cultivation	Mean	0.0	0.0	0.0
4. Cultivation	Pre-plant	2000 mL/ha 1000 g/ha	1	0.0	0.0	0.0	
			DUAL GOLD 0 DAT	2	0.0	0.0	0.0
			BARON WP 3 DAT	3	0.0	0.0	0.0
				Mean	0.0	0.0	0.0
5. Cultivation	Pre-plant	2000 mL/ha 500 g/ha	1	0.0	0.0	0.0	
			DUAL GOLD 0 DAT	2	0.0	0.0	0.0
			BARON WP 3 WAT	3	0.0	0.0	0.0
				Mean	0.0	0.0	0.0
6. Cultivation	Pre-plant	2000 mL/ha 1000 g/ha 150 g/ha	1	0.0	0.0	0.0	
			DUAL GOLD 0 DAT	2	0.0	0.0	0.0
			BARON WP 3 DAT	3	0.0	0.0	0.0
			BARON WP 3 WAT	Mean	0.0	0.0	0.0
7. Cultivation	Pre-plant	2000 mL/ha 1000 g/ha 250 g/ha	1	0.0	0.0	0.0	
			DUAL GOLD 0 DAT	2	0.0	0.0	0.0
			BARON WP 3 DAT	3	0.0	0.0	0.0
			BARON WP 3 WAT	Mean	0.0	0.0	0.0
8. Cultivation	Pre-plant	2000 mL/ha 1000 g/ha 150 g/ha (shielded)	1	0.0	0.0	0.0	
			DUAL GOLD 0 DAT	2	0.0	0.0	0.0
			BARON WP 3 DAT	3	0.0	0.0	0.0
			BARON WP 3 WAT	Mean	0.0	0.0	0.0
9. Cultivation	Pre-plant	2000 mL/ha 1000 g/ha 250 g/ha (shielded)	1	0.0	0.0	0.0	
			DUAL GOLD 0 DAT	2	0.0	0.0	0.0
			BARON WP 3 DAT	3	0.0	0.0	0.0
			BARON WP 3 WAT	Mean	0.0	0.0	0.0
10. Cultivation	Pre-plant	2000 mL/ha 1000 g/ha 500 g/ha (shielded)	1	0.0	0.0	0.0	
			DUAL GOLD 0 DAT	2	0.0	0.0	0.0
			BARON WP 3 DAT	3	0.0	0.0	0.0
			BARON WP 3 WAT	Mean	0.0	0.0	0.0
11. Cultivation	Pre-plant	500 g/ha	1	0.0	0.0	0.0	
			BARON WP 3 DAT	2	0.0	0.0	0.0
				3	0.0	0.0	0.0
				Mean	0.0	0.0	0.0
12. Cultivation	Pre-plant	1000 g/ha	1	0.0	0.0	0.0	
			BARON WP 3 DAT	2	0.0	0.0	0.0
				3	0.0	0.0	0.0
				Mean	0.0	0.0	0.0

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.15 Trial 3, Bathurst, NSW, Cauliflower - Shepherd's Purse (*Capsella bursa-pastoris*) Percentage Weed Control

Treatment	Application Timing	Rate Prod/ha	Rep	23 DAT 19-Mar-10	36 DAT 01-Apr-10	54 DAT 19-Apr-10	71 DAT 06-May-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0	0.0
			2	0.0	0.0	0.0	0.0
			3	0.0	0.0	0.0	0.0
			Mean	0.0	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	0.0	60.0	40.0	0.0
	Post-plant		2	0.0	50.0	30.0	0.0
			3	0.0	50.0	20.0	0.0
	Mean		0.0	53.3	30.0	0.0	
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant		1	95.0	95.0	90.0	90.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	90.0	90.0	100.0	100.0
	Mean		95.0	95.0	96.7	96.7	
4. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	Mean		100.0	100.0	100.0	100.0	
5. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	3 WAT	500 g/ha	3	100.0	100.0	90.0	90.0
	Mean		100.0	100.0	96.7	96.7	
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	95.0
	2 DAT	1000 g/ha	3	95.0	90.0	95.0	95.0
	3 WAT	150 g/ha	Mean	98.3	96.7	98.3	96.7
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	95.0	90.0	100.0	100.0
	3 WAT	250 g/ha	Mean	98.3	96.7	100.0	100.0
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	150 g/ha (shielded)	Mean	100.0	100.0	100.0	100.0
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	95.0
	2 DAT	1000 g/ha	3	100.0	100.0	90.0	90.0
	3 WAT	250 g/ha (shielded)	Mean	100.0	100.0	96.7	95.0
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	95.0	90.0	100.0	100.0
	3 WAT	500 g/ha (shielded)	Mean	98.3	96.7	100.0	100.0
11. Cultivation FRONTIER-P	Pre-plant		1	90.0	90.0	70.0	60.0
	0 DAT	700 mL/ha	2	100.0	100.0	90.0	80.0
			3	80.0	60.0	60.0	50.0
	Mean		90.0	83.3	73.3	63.3	
12. Cultivation FRONTIER-P	Pre-plant		1	90.0	90.0	70.0	60.0
	0 DAT	1000 mL/ha	2	90.0	80.0	90.0	90.0
			3	60.0	50.0	50.0	50.0
	Mean		80.0	73.3	70.0	66.7	
13. Cultivation FRONTIER-P BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	700 mL/ha	2	95.0	90.0	100.0	100.0
	3 DAT	1000 g/ha	3	90.0	80.0	100.0	100.0
	Mean		95.0	90.0	100.0	100.0	

DAT - days after transplanting; WAT - weeks after transplanting

**11.1.16 Trial 3, Bathurst, NSW, Cauliflower - Saffron Thistle (*Carthamus lanatus*)  
Percentage Weed Control**

Treatment	Application Timing	Rate Prod/ha	Rep	23 DAT 19-Mar-10	36 DAT 01-Apr-10	54 DAT 19-Apr-10	71 DAT 06-May-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0	0.0
			2	0.0	0.0	0.0	0.0
			3	0.0	0.0	0.0	0.0
			Mean	0.0	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	0.0	50.0	30.0	0.0
	Post-plant		2	0.0	50.0	30.0	0.0
			3	0.0	0.0	20.0	0.0
	Mean			0.0	33.3	26.7	0.0
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant		1	95.0	95.0	90.0	90.0
	0 DAT	1500 mL/ha	2	100.0	100.0	90.0	90.0
	2 DAT	1000 g/ha	3	90.0	90.0	50.0	50.0
	Mean			95.0	95.0	76.7	76.7
4. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	95.0	90.0	90.0	80.0
	Mean			98.3	96.7	96.7	93.3
5. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	3 WAT	500 g/ha	3	100.0	100.0	60.0	60.0
	Mean			100.0	100.0	86.7	86.7
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	95.0	95.0
	2 DAT	1000 g/ha	3	95.0	90.0	50.0	20.0
	3 WAT	150 g/ha	Mean	98.3	96.7	81.7	71.7
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	95.0	90.0
	2 DAT	1000 g/ha	3	95.0	90.0	10.0	0.0
	3 WAT	250 g/ha	Mean	98.3	96.7	68.3	63.3
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	95.0	95.0	60.0	50.0
	2 DAT	1000 g/ha	3	100.0	100.0	50.0	20.0
	3 WAT	150 g/ha (shielded)	Mean	98.3	98.3	70.0	56.7
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	90.0	90.0
	0 DAT	1500 mL/ha	2	100.0	100.0	90.0	90.0
	2 DAT	1000 g/ha	3	100.0	100.0	60.0	40.0
	3 WAT	250 g/ha (shielded)	Mean	100.0	100.0	80.0	73.3
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	90.0	80.0
	2 DAT	1000 g/ha	3	95.0	90.0	50.0	20.0
	3 WAT	500 g/ha (shielded)	Mean	98.3	96.7	80.0	66.7
11. Cultivation FRONTIER-P	Pre-plant		1	90.0	90.0	70.0	60.0
	0 DAT	700 mL/ha	2	0.0	0.0	0.0	0.0
			3	80.0	60.0	50.0	20.0
	Mean			56.7	50.0	40.0	26.7
12. Cultivation FRONTIER-P	Pre-plant		1	90.0	90.0	70.0	60.0
	0 DAT	1000 mL/ha	2	85.0	80.0	80.0	70.0
			3	60.0	50.0	50.0	20.0
	Mean			78.3	73.3	66.7	50.0
13. Cultivation FRONTIER-P BARON WP	Pre-plant		1	100.0	100.0	90.0	90.0
	0 DAT	700 mL/ha	2	95.0	90.0	70.0	70.0
	3 DAT	1000 g/ha	3	90.0	80.0	10.0	0.0
	Mean			95.0	90.0	56.7	53.3

DAT - days after transplanting; WAT - weeks after transplanting

**11.1.17 Trial 3, Bathurst, NSW, Cauliflower - Chickweed (*Stellaria media*)  
Percentage Weed Control**

Treatment	Application Timing	Rate Prod/ha	Rep	23 DAT 19-Mar-10	36 DAT 01-Apr-10	54 DAT 19-Apr-10	71 DAT 06-May-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0	0.0
			2	0.0	0.0	0.0	0.0
			3	0.0	0.0	0.0	0.0
			Mean	0.0	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	0.0	40.0	20.0	0.0
	Post-plant		2	0.0	50.0	20.0	0.0
			3	0.0	50.0	20.0	0.0
	Mean			0.0	46.7	20.0	0.0
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant		1	95.0	95.0	80.0	80.0
	0 DAT	1500 mL/ha	2	100.0	100.0	90.0	90.0
	2 DAT	1000 g/ha	3	90.0	90.0	90.0	90.0
	Mean			95.0	95.0	86.7	86.7
4. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	100.0	100.0	95.0
	0 DAT	1500 mL/ha	2	100.0	100.0	95.0	95.0
	2 DAT	1000 g/ha	3	100.0	100.0	90.0	80.0
	Mean			100.0	100.0	95.0	90.0
5. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	100.0	90.0	90.0
	0 DAT	1500 mL/ha	2	90.0	80.0	70.0	60.0
	3 WAT	500 g/ha	3	100.0	100.0	80.0	80.0
	Mean			96.7	93.3	80.0	76.7
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	95.0
	0 DAT	1500 mL/ha	2	100.0	100.0	95.0	90.0
	2 DAT	1000 g/ha	3	95.0	95.0	95.0	90.0
	3 WAT	150 g/ha	Mean	98.3	98.3	96.7	91.7
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	95.0
	0 DAT	1500 mL/ha	2	100.0	100.0	95.0	95.0
	2 DAT	1000 g/ha	3	100.0	100.0	90.0	90.0
	3 WAT	250 g/ha	Mean	100.0	100.0	95.0	93.3
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	95.0
	0 DAT	1500 mL/ha	2	95.0	90.0	80.0	80.0
	2 DAT	1000 g/ha	3	100.0	100.0	95.0	95.0
	3 WAT	150 g/ha (shielded)	Mean	98.3	96.7	91.7	90.0
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	90.0	90.0
	0 DAT	1500 mL/ha	2	100.0	100.0	95.0	95.0
	2 DAT	1000 g/ha	3	100.0	100.0	90.0	90.0
	3 WAT	250 g/ha (shielded)	Mean	100.0	100.0	91.7	91.7
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	95.0
	0 DAT	1500 mL/ha	2	100.0	100.0	95.0	95.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0	95.0
	3 WAT	500 g/ha (shielded)	Mean	100.0	100.0	98.3	95.0
11. Cultivation FRONTIER-P	Pre-plant		1	85.0	80.0	60.0	50.0
	0 DAT	700 mL/ha	2	20.0	10.0	0.0	0.0
			3	60.0	50.0	40.0	20.0
	Mean			55.0	46.7	33.3	23.3
12. Cultivation FRONTIER-P	Pre-plant		1	85.0	80.0	70.0	50.0
	0 DAT	1000 mL/ha	2	20.0	10.0	10.0	0.0
			3	80.0	60.0	60.0	50.0
	Mean			61.7	50.0	46.7	33.3
13. Cultivation FRONTIER-P BARON WP	Pre-plant		1	100.0	95.0	80.0	80.0
	0 DAT	700 mL/ha	2	95.0	90.0	70.0	70.0
	3 DAT	1000 g/ha	3	80.0	80.0	30.0	30.0
	Mean			91.7	88.3	60.0	60.0

DAT - days after transplanting; WAT - weeks after transplanting

**11.1.18 Trial 3, Bathurst, NSW, Cauliflower - Pigweed (*Portulaca oleraceus*)  
Percentage Weed Control**

Treatment	Application Timing	Rate Prod/ha	Rep	23 DAT 19-Mar-10	36 DAT 01-Apr-10	54 DAT 19-Apr-10	71 DAT 06-May-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0	0.0
			2	0.0	0.0	0.0	0.0
			3	0.0	0.0	0.0	0.0
			Mean	0.0	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	0.0	50.0	20.0	0.0
	Post-plant		2	0.0	50.0	30.0	0.0
			3	0.0	50.0	20.0	0.0
	Mean		Mean	0.0	50.0	23.3	0.0
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant		1	100.0	95.0	90.0	90.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	Mean		Mean	100.0	98.3	96.7	96.7
4. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	Mean		Mean	100.0	100.0	100.0	100.0
5. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	70.0	70.0
	3 WAT	500 g/ha	3	100.0	100.0	100.0	100.0
	Mean		Mean	100.0	100.0	90.0	90.0
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	150 g/ha	Mean	100.0	100.0	100.0	100.0
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	250 g/ha	Mean	100.0	100.0	100.0	100.0
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	80.0	80.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	150 g/ha (shielded)	Mean	100.0	100.0	93.3	93.3
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	90.0	90.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	250 g/ha (shielded)	Mean	100.0	100.0	96.7	96.7
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	10.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	500 g/ha (shielded)	Mean	70.0	100.0	100.0	100.0
11. Cultivation FRONTIER-P	Pre-plant		1	90.0	90.0	90.0	60.0
	0 DAT	700 mL/ha	2	0.0	0.0	0.0	0.0
			3	70.0	50.0	80.0	80.0
	Mean		Mean	53.3	46.7	56.7	46.7
12. Cultivation FRONTIER-P	Pre-plant		1	90.0	90.0	80.0	80.0
	0 DAT	1000 mL/ha	2	90.0	80.0	50.0	50.0
			3	90.0	80.0	90.0	90.0
	Mean		Mean	90.0	83.3	73.3	73.3
13. Cultivation FRONTIER-P BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	700 mL/ha	2	95.0	90.0	90.0	90.0
	3 DAT	1000 g/ha	3	90.0	80.0	90.0	90.0
	Mean		Mean	95.0	90.0	93.3	93.3

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.19 Trial 3, Bathurst, NSW, Cauliflower - Deadnettle (*Lamium amplexicaule*) Percentage Weed Control

Treatment	Application Timing	Rate Prod/ha	Rep	23 DAT 19-Mar-10	36 DAT 01-Apr-10	54 DAT 19-Apr-10	71 DAT 06-May-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0	0.0
			2	0.0	0.0	0.0	0.0
			3	0.0	0.0	0.0	0.0
			Mean	0.0	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	0.0	50.0	50.0	0.0
	Post-plant		2	0.0	50.0	30.0	0.0
			3	0.0	50.0	20.0	0.0
	Mean		0.0	50.0	33.3	0.0	
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant		1	95.0	95.0	90.0	90.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	95.0	90.0	100.0	100.0
	Mean		96.7	95.0	96.7	96.7	
4. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	Mean		100.0	100.0	100.0	100.0	
5. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	3 WAT	500 g/ha	3	100.0	100.0	100.0	100.0
	Mean		100.0	100.0	100.0	100.0	
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	150 g/ha	Mean	100.0	100.0	100.0	100.0
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	95.0	90.0	100.0	100.0
	3 WAT	250 g/ha	Mean	98.3	96.7	100.0	100.0
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	150 g/ha (shielded)	Mean	100.0	100.0	100.0	100.0
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	90.0	90.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	250 g/ha (shielded)	Mean	100.0	100.0	96.7	96.7
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	500 g/ha (shielded)	Mean	100.0	100.0	100.0	100.0
11. Cultivation FRONTIER-P	Pre-plant		1	90.0	90.0	90.0	60.0
	0 DAT	700 mL/ha	2	100.0	100.0	0.0	0.0
			3	70.0	50.0	80.0	80.0
	Mean		86.7	80.0	56.7	46.7	
12. Cultivation FRONTIER-P	Pre-plant		1	90.0	90.0	90.0	80.0
	0 DAT	1000 mL/ha	2	80.0	80.0	50.0	50.0
			3	95.0	90.0	100.0	100.0
	Mean		88.3	86.7	80.0	76.7	
13. Cultivation FRONTIER-P BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	700 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	90.0	80.0	100.0	100.0
	Mean		96.7	93.3	100.0	100.0	

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.20 Trial 3, Bathurst, NSW, Cauliflower - Paterson's Curse (*Echium plantagineum*) Percentage Weed Control

Treatment	Application Timing	Rate Prod/ha	Rep	23 DAT 19-Mar-10	36 DAT 01-Apr-10	54 DAT 19-Apr-10	71 DAT 06-May-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0	0.0
			2	0.0	0.0	0.0	0.0
			3	0.0	0.0	0.0	0.0
			Mean	0.0	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	0.0	50.0	40.0	0.0
	Post-plant		2	0.0	50.0	30.0	0.0
			3	0.0	50.0	20.0	0.0
	Mean			0.0	50.0	30.0	0.0
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant		1	100.0	95.0	90.0	90.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	95.0	90.0	100.0	100.0
	Mean			98.3	95.0	96.7	96.7
4. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	Mean			100.0	100.0	100.0	100.0
5. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	3 WAT	500 g/ha	3	100.0	100.0	100.0	95.0
	Mean			100.0	100.0	100.0	98.3
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	95.0
	2 DAT	1000 g/ha	3	95.0	90.0	100.0	100.0
	3 WAT	150 g/ha	Mean	98.3	96.7	100.0	98.3
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	95.0	90.0	100.0	100.0
	3 WAT	250 g/ha	Mean	98.3	96.7	100.0	100.0
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	150 g/ha (shielded)	Mean	100.0	100.0	100.0	100.0
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	250 g/ha (shielded)	Mean	100.0	100.0	100.0	100.0
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	1500 mL/ha	2	100.0	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	95.0	90.0	100.0	100.0
	3 WAT	500 g/ha (shielded)	Mean	98.3	96.7	100.0	100.0
11. Cultivation FRONTIER-P	Pre-plant		1	90.0	90.0	100.0	60.0
	0 DAT	700 mL/ha	2	100.0	100.0	100.0	100.0
			3	70.0	60.0	90.0	80.0
	Mean			86.7	83.3	96.7	80.0
12. Cultivation FRONTIER-P	Pre-plant		1	90.0	90.0	100.0	90.0
	0 DAT	1000 mL/ha	2	90.0	80.0	100.0	90.0
			3	60.0	50.0	90.0	90.0
	Mean			80.0	73.3	96.7	90.0
13. Cultivation FRONTIER-P BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	700 mL/ha	2	90.0	90.0	100.0	100.0
	3 DAT	1000 g/ha	3	90.0	80.0	100.0	90.0
	Mean			93.3	90.0	100.0	96.7

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.21 Trial 3, Bathurst, NSW, Cauliflower - Weed Counts at 54 DAT per 1 m<sup>2</sup>

Treatment	Application Timing	Rate Prod/ha	Rep	Shepherd's Pursue 19-Apr-10	Saffron Thistle 19-Apr-10	Chickweed 19-Apr-10	Pigweed 19-Apr-10	Dead Nettle 19-Apr-10	Paterson's Curse 19-Apr-10	Couch 19-Apr-10
1. Cultivation	Pre-plant		1	18.3	0.7	46.7	0.0	2.0	0.0	0.0
			2	11.7	5.3	17.7	0.3	1.0	1.3	2.3
			3	12.3	3.3	50.0	1.3	1.7	2.7	3.3
			Mean	14.1	3.1	38.1	0.6	1.6	1.3	1.9
2. Cultivation Hand Weeding	Pre-plant		1	8.3	3.3	27.0	0.7	1.3	0.7	1.3
			2	6.0	1.7	4.3	0.0	0.7	0.3	0.7
	Post-plant		3	8.7	4.3	15.0	0.0	0.3	0.7	2.3
			Mean	7.7	3.1	15.4	0.2	0.8	0.6	1.4
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant 0 DAT 2 DAT	1500 mL/ha 1000 g/ha	1	0.7	0.3	7.3	0.0	0.0	0.3	0.0
			2	0.0	0.3	3.7	0.0	0.0	0.0	0.0
			3	0.0	3.7	2.7	0.0	0.0	0.0	2.3
			Mean	0.2	1.4	4.6	0.0	0.0	0.1	0.8
4. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 2 DAT	1500 mL/ha 1000 g/ha	1	0.0	0.0	0.0	0.0	0.0	0.0	1.3
			2	0.0	0.0	5.0	0.0	0.0	0.0	0.0
			3	0.0	1.7	3.7	0.0	0.0	0.0	0.0
			Mean	0.0	0.6	2.9	0.0	0.0	0.0	0.4
5. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 WAT	1500 mL/ha 500 g/ha	1	0.0	0.0	3.7	0.0	0.0	0.0	4.3
			2	0.0	0.0	6.0	0.0	0.0	0.0	0.7
			3	0.3	3.3	4.0	0.3	0.0	0.0	0.7
			Mean	0.1	1.1	4.6	0.1	0.0	0.0	1.9
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	1500 mL/ha 1000 g/ha 150 g/ha	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
			2	0.0	0.7	2.7	0.0	0.0	0.0	1.3
			3	0.3	8.0	6.7	0.0	0.0	0.0	2.0
			Mean	0.1	2.9	3.1	0.0	0.0	0.0	1.1
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	1500 mL/ha 1000 g/ha 250 g/ha	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
			2	0.0	0.7	2.3	0.0	0.0	0.0	0.0
			3	0.0	8.3	2.0	0.0	0.0	0.0	0.7
			Mean	0.0	3.0	1.4	0.0	0.0	0.0	0.2
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	1500 mL/ha 1000 g/ha 150 g/ha (shielded)	1	0.0	0.0	0.0	0.0	0.0	0.0	0.3
			2	0.0	5.7	5.0	0.0	0.0	0.0	0.0
			3	0.0	2.0	3.7	0.0	0.0	0.0	0.7
			Mean	0.0	2.6	2.9	0.0	0.0	0.0	0.3
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	1500 mL/ha 1000 g/ha 250 g/ha (shielded)	1	0.0	0.7	10.3	0.0	0.0	0.0	0.0
			2	0.0	0.3	3.7	0.0	0.0	0.0	4.0
			3	0.7	5.3	6.3	0.0	0.0	0.0	1.3
			Mean	0.2	2.1	6.8	0.0	0.0	0.0	1.8
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	1500 mL/ha 1000 g/ha 500 g/ha (shielded)	1	0.0	0.0	0.0	0.0	0.0	0.0	0.7
			2	0.0	3.7	2.0	0.0	0.0	0.0	0.0
			3	0.0	4.7	0.0	0.0	0.0	0.0	0.3
			Mean	0.0	2.8	0.7	0.0	0.0	0.0	0.3
11. Cultivation FRONTIER-P	Pre-plant 0 DAT	700 mL/ha	1	3.3	0.7	13.0	0.0	0.3	0.0	0.3
			2	3.3	1.0	21.7	0.0	0.3	0.0	0.3
			3	4.7	4.0	14.7	0.0	0.3	1.7	0.3
			Mean	3.8	1.9	16.4	0.0	0.3	0.6	0.3
12. Cultivation FRONTIER-P	Pre-plant 0 DAT	1000 mL/ha	1	3.0	0.7	14.7	0.0	0.3	0.0	0.0
			2	2.3	1.0	28.3	0.0	0.7	0.0	2.3
			3	3.7	1.0	6.0	4.0	0.0	1.3	1.0
			Mean	3.0	0.9	16.3	1.3	0.3	0.4	1.1
13. Cultivation FRONTIER-P BARON WP	Pre-plant 0 DAT 3 DAT	700 mL/ha 1000 g/ha	1	0.0	0.3	2.3	0.0	0.0	0.0	0.0
			2	0.0	1.3	4.3	0.0	0.0	0.0	1.0
			3	0.0	5.0	6.0	0.0	0.0	0.0	0.0
			Mean	0.0	2.2	4.2	0.0	0.0	0.0	0.3

DAT - days after transplanting; WAT - weeks after transplanting



### 11.1.22 Trial 3, Bathurst, NSW, Cauliflower – Percentage Phytotoxicity

Treatment	Application Timing	Rate Prod/ha	Rep	11 DAT 09-Mar-10	3 WAT 19-Mar-10	5 WAT 01-Apr-10	8 WAT 19-Apr-10	12 WAT 06-May-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0	0.0	0.0
			2	0.0	0.0	0.0	0.0	0.0
			3	0.0	0.0	0.0	0.0	0.0
			Mean	0.0	0.0	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	0.0	0.0	0.0	0.0	0.0
			2	0.0	0.0	0.0	0.0	0.0
	Post-plant		3	0.0	0.0	0.0	0.0	0.0
			Mean	0.0	0.0	0.0	0.0	0.0
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant	1500 mL/ha 1000 g/ha	1	0.0	0.0	0.0	0.0	0.0
			2	0.0	0.0	0.0	0.0	0.0
			3	0.0	0.0	0.0	0.0	0.0
			Mean	0.0	0.0	0.0	0.0	0.0
4. Cultivation DUAL GOLD BARON WP	Pre-plant	1500 mL/ha 1000 g/ha	1	3.0	0.0	0.0	0.0	0.0
			2	4.0	0.0	0.0	0.0	0.0
			3	2.0	0.0	0.0	0.0	0.0
			Mean	3.0	0.0	0.0	0.0	0.0
5. Cultivation DUAL GOLD BARON WP	Pre-plant	1500 mL/ha 500 g/ha	1	0.0	0.0	0.0	0.0	0.0
			2	0.0	0.0	0.0	0.0	0.0
			3	0.0	0.0	0.0	0.0	0.0
			Mean	0.0	0.0	0.0	0.0	0.0
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	1500 mL/ha 1000 g/ha 150 g/ha	1	3.0	0.0	0.0	0.0	0.0
			2	2.0	0.0	0.0	0.0	0.0
			3	2.0	0.0	0.0	0.0	0.0
			Mean	2.3	0.0	0.0	0.0	0.0
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	1500 mL/ha 1000 g/ha 250 g/ha	1	3.0	0.0	0.0	0.0	0.0
			2	3.0	0.0	0.0	0.0	0.0
			3	3.0	0.0	0.0	0.0	0.0
			Mean	3.0	0.0	0.0	0.0	0.0
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	1500 mL/ha 1000 g/ha 150 g/ha (shielded)	1	3.0	0.0	0.0	0.0	0.0
			2	3.0	0.0	0.0	0.0	0.0
			3	2.0	0.0	0.0	0.0	0.0
			Mean	2.7	0.0	0.0	0.0	0.0
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	1500 mL/ha 1000 g/ha 250 g/ha (shielded)	1	3.0	0.0	0.0	0.0	0.0
			2	3.0	0.0	0.0	0.0	0.0
			3	3.0	0.0	0.0	0.0	0.0
			Mean	3.0	0.0	0.0	0.0	0.0
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	1500 mL/ha 1000 g/ha 500 g/ha (shielded)	1	3.0	0.0	0.0	0.0	0.0
			2	3.0	0.0	0.0	0.0	0.0
			3	3.0	0.0	0.0	0.0	0.0
			Mean	3.0	0.0	0.0	0.0	0.0
11. Cultivation FRONTIER-P	Pre-plant	700 mL/ha	1	2.0	0.0	0.0	0.0	0.0
			2	4.0	0.0	0.0	0.0	0.0
			3	7.0	0.0	0.0	0.0	0.0
			Mean	4.3	0.0	0.0	0.0	0.0
12. Cultivation FRONTIER-P	Pre-plant	1000 mL/ha	1	3.0	0.0	0.0	0.0	0.0
			2	3.0	0.0	0.0	0.0	0.0
			3	2.0	0.0	0.0	0.0	0.0
			Mean	2.7	0.0	0.0	0.0	0.0
13. Cultivation FRONTIER-P BARON WP	Pre-plant	700 mL/ha 1000 g/ha	1	3.0	0.0	0.0	0.0	0.0
			2	7.0	0.0	0.0	0.0	0.0
			3	3.0	0.0	0.0	0.0	0.0
			Mean	4.3	0.0	0.0	0.0	0.0

DAT - days after transplanting; WAT - weeks after transplanting

**11.1.23 Trial 4, Coldstream, Vic, Brussels Sprouts - Fat Hen (*Chenopodium album*) Percentage Weed Control**

Treatment	Application Timing	Rate Prod/ha	Rep	21 DAT	36 DAT	51 DAT	58 DAT
				22-Feb-10	09-Mar-10	24-Mar-10	31-Mar-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0	0.0
			2	0.0	0.0	0.0	0.0
			3	0.0	0.0	0.0	0.0
			Mean	0.0	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	0.0	100.0	80.0	0.0
	Post-plant		2	0.0	60.0	50.0	0.0
			3	0.0	0.0	50.0	0.0
			Mean	0.0	53.3	60.0	0.0
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant		1	100.0	80.0	100.0	90.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	50.0
			Mean	100.0	93.3	100.0	80.0
4. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	100.0	80.0	95.0
	0 DAT	2000 mL/ha	2	90.0	100.0	50.0	55.0
	3 DAT	1000 g/ha	3	100.0	100.0	90.0	0.0
			Mean	96.7	100.0	73.3	50.0
5. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	100.0	100.0	55.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 WAT	500 g/ha	3	90.0	50.0	50.0	100.0
			Mean	96.7	83.3	83.3	85.0
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	0.0
	3 DAT	1000 g/ha	3	90.0	50.0	50.0	0.0
	3 WAT	150 g/ha	Mean	96.7	83.3	83.3	33.3
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	90.0	50.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	90.0	100.0	50.0	0.0
	3 WAT	250 g/ha	Mean	96.7	100.0	80.0	50.0
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	0.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	50.0
	3 WAT	150 g/ha (shielded)	Mean	100.0	100.0	100.0	50.0
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	0.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	50.0	100.0
	3 WAT	250 g/ha (shielded)	Mean	100.0	100.0	83.3	66.7
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	0.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	70.0	70.0	100.0
	3 WAT	500 g/ha (shielded)	Mean	100.0	90.0	90.0	66.7

DAT - days after transplanting; WAT - weeks after transplanting

**11.1.24 Trial 4, Coldstream, Vic, Brussels Sprouts - Capeweed (*Arctotheca calendula*) Percentage Weed Control**

Treatment	Application Timing	Rate Prod/ha	Rep	21 DAT	36 DAT	51 DAT	58 DAT
				22-Feb-10	09-Mar-10	24-Mar-10	31-Mar-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0	0.0
			2	0.0	0.0	0.0	0.0
			3	0.0	0.0	0.0	0.0
			Mean	0.0	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	0.0	90.0	90.0	0.0
	Post-plant		2	0.0	0.0	100.0	100.0
			3	0.0	0.0	100.0	100.0
			Mean	0.0	30.0	96.7	66.7
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	70.0	100.0
			Mean	100.0	100.0	90.0	100.0
4. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	90.0	50.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
			Mean	100.0	96.7	83.3	100.0
5. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	100.0	90.0	90.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 WAT	500 g/ha	3	100.0	100.0	100.0	100.0
			Mean	100.0	100.0	96.7	96.7
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	150 g/ha	Mean	100.0	100.0	100.0	100.0
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	90.0
	0 DAT	2000 mL/ha	2	90.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	250 g/ha	Mean	96.7	100.0	100.0	96.7
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	150 g/ha (shielded)	Mean	100.0	100.0	100.0	100.0
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	250 g/ha (shielded)	Mean	100.0	100.0	100.0	100.0
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	500 g/ha (shielded)	Mean	100.0	100.0	100.0	100.0

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.25 Trial 4, Coldstream, Vic, Brussels Sprouts - Wireweed (*Polygonum aviculare*) Percentage Weed Control

Treatment	Application Timing	Rate Prod/ha	Rep	21 DAT	36 DAT	51 DAT	58 DAT
				22-Feb-10	09-Mar-10	24-Mar-10	31-Mar-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0	0.0
			2	0.0	0.0	0.0	0.0
			3	0.0	0.0	0.0	0.0
			Mean	0.0	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	100.0	100.0	80.0	80.0
	Post-plant		2	100.0	100.0	100.0	100.0
			3	100.0	100.0	100.0	100.0
		Mean	100.0	100.0	93.3	93.3	
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	Mean		100.0	100.0	100.0	100.0	
4. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	Mean		100.0	100.0	100.0	100.0	
5. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 WAT	500 g/ha	3	100.0	100.0	100.0	100.0
	Mean		100.0	100.0	100.0	100.0	
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	90.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	150 g/ha	Mean	96.7	100.0	100.0	100.0
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	250 g/ha	Mean	100.0	100.0	100.0	100.0
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	150 g/ha (shielded)	Mean	100.0	100.0	100.0	100.0
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	250 g/ha (shielded)	Mean	100.0	100.0	100.0	100.0
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	500 g/ha (shielded)	Mean	100.0	100.0	100.0	100.0

DAT - days after transplanting; WAT - weeks after transplanting

**11.1.26 Trial 4, Coldstream, Vic, Brussels Sprouts - Marshmallow (*Malva parviflora*) Percentage Weed Control**

Treatment	Application Timing	Rate Prod/ha	Rep	21 DAT	36 DAT	51 DAT	58 DAT
				22-Feb-10	09-Mar-10	24-Mar-10	31-Mar-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0	0.0
			2	0.0	0.0	0.0	0.0
			3	0.0	0.0	0.0	0.0
			Mean	0.0	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	100.0	100.0	100.0	100.0
	Post-plant		2	100.0	100.0	100.0	100.0
			3	100.0	100.0	100.0	100.0
		Mean	100.0	100.0	100.0	100.0	
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	Mean		100.0	100.0	100.0	100.0	
4. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	90.0	90.0	90.0	90.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	Mean		96.7	96.7	96.7	96.7	
5. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 WAT	500 g/ha	3	100.0	100.0	100.0	100.0
	Mean		100.0	100.0	100.0	100.0	
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	150 g/ha	Mean	100.0	100.0	100.0	100.0
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	250 g/ha	Mean	100.0	100.0	100.0	100.0
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	150 g/ha (shielded)	Mean	100.0	100.0	100.0	100.0
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	250 g/ha (shielded)	Mean	100.0	100.0	100.0	100.0
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	500 g/ha (shielded)	Mean	100.0	100.0	100.0	100.0

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.27 Trial 4, Coldstream, Vic, Brussels Sprouts - Annual Ryegrass (*Lolium rigidum*) Percentage Weed Control

Treatment	Application Timing	Rate Prod/ha	Rep	21 DAT	36 DAT	51 DAT	58 DAT
				22-Feb-10	09-Mar-10	24-Mar-10	31-Mar-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0	0.0
			2	0.0	0.0	0.0	0.0
			3	0.0	0.0	0.0	0.0
			Mean	0.0	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	100.0	100.0	100.0	100.0
	Post-plant		2	0.0	100.0	0.0	100.0
			3	100.0	100.0	0.0	0.0
		Mean	66.7	100.0	33.3	66.7	
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	Mean	100.0	100.0	100.0	100.0		
4. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	Mean	100.0	100.0	100.0	100.0		
5. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 WAT	500 g/ha	3	100.0	100.0	100.0	100.0
	Mean	100.0	100.0	100.0	100.0		
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	150 g/ha	Mean	100.0	100.0	100.0	100.0
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	250 g/ha	Mean	100.0	100.0	100.0	100.0
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	150 g/ha (shielded)	Mean	100.0	100.0	100.0	100.0
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	250 g/ha (shielded)	Mean	100.0	100.0	100.0	100.0
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0	100.0
	3 WAT	500 g/ha (shielded)	Mean	100.0	100.0	100.0	100.0

DAT - days after transplanting; WAT - weeks after transplanting

**11.1.28 Trial 4, Coldstream, Vic, Brussels Sprouts - Number of Weeds by Species at 36 DAT per 0.1m<sup>2</sup>**

Treatment	Application Timing	Rate Prod/ha	Rep	Capeweed	Marshmallow	Ryegrass	Wireweed	Fat Hen
				09-Mar-10	09-Mar-10	09-Mar-10	09-Mar-10	09-Mar-10
1. Cultivation	Pre-plant		1	18.0	28.0	29.0	18.0	30.0
			2	6.0	9.0	9.0	6.0	9.0
			3	17.0	27.0	28.0	17.0	53.0
			Mean	13.7	21.3	22.0	13.7	30.7
2. Cultivation Hand Weeding	Pre-plant		1	21.0	2.0	5.0	21.0	6.0
			2	6.0	2.0	2.0	6.0	8.0
	Post-plant		3	18.0	7.0	4.0	18.0	6.0
			Mean	15.0	3.7	3.7	15.0	6.7
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant 0 DAT 3 DAT	2000 mL/ha 1000 g/ha	1	0.0	1.0	0.0	0.0	3.0
			2	0.0	0.0	0.0	0.0	0.0
			3	0.0	0.0	1.0	0.0	2.0
			Mean	0.0	0.3	0.3	0.0	1.7
4. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 DAT	2000 mL/ha 1000 g/ha	1	0.0	1.0	3.0	0.0	2.0
			2	2.0	1.0	2.0	2.0	6.0
			3	0.0	0.0	1.0	0.0	12.0
			Mean	0.7	0.7	2.0	0.7	6.7
5. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 WAT	2000 mL/ha 500 g/ha	1	0.0	0.0	1.0	0.0	4.0
			2	0.0	0.0	0.0	0.0	0.0
			3	1.0	2.0	2.0	1.0	0.0
			Mean	0.3	0.7	1.0	0.3	1.3
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	2000 mL/ha 1000 g/ha 150 g/ha	1	1.0	0.0	0.0	1.0	0.0
			2	0.0	0.0	0.0	0.0	0.0
			3	2.0	1.0	1.0	2.0	4.0
			Mean	1.0	0.3	0.3	1.0	1.3
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	2000 mL/ha 1000 g/ha 250 g/ha	1	1.0	0.0	1.0	1.0	3.0
			2	1.0	0.0	0.0	1.0	0.0
			3	3.0	0.0	1.0	3.0	3.0
			Mean	1.7	0.0	0.7	1.7	2.0
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	2000 mL/ha 1000 g/ha 150 g/ha (shielded)	1	0.0	0.0	0.0	0.0	0.0
			2	0.0	0.0	0.0	0.0	0.0
			3	0.0	0.0	0.0	0.0	4.0
			Mean	0.0	0.0	0.0	0.0	1.3
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	2000 mL/ha 1000 g/ha 250 g/ha (shielded)	1	0.0	0.0	0.0	0.0	0.0
			2	1.0	0.0	0.0	1.0	0.0
			3	0.0	0.0	1.0	0.0	0.0
			Mean	0.3	0.0	0.3	0.3	0.0
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	2000 mL/ha 1000 g/ha 500 g/ha (shielded)	1	0.0	0.0	0.0	0.0	0.0
			2	0.0	0.0	0.0	0.0	0.0
			3	0.0	3.0	1.0	0.0	0.0
			Mean	0.0	1.0	0.3	0.0	0.0

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.29 Trial 4, Coldstream, Vic, Brussels Sprouts - Percentage Crop Phytotoxicity

Treatment	Application Timing	Rate Prod/ha	Rep	7 DAT	36 DAT
				08-Feb-10	09-Mar-10
1. Cultivation	Pre-plant		1	0.0	0.0
			2	0.0	0.0
			3	0.0	0.0
			Mean	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	2.0	0.0
	Post-plant		2	0.0	0.0
			3	0.0	0.0
			Mean	0.6	0.0
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant		1	3.0	0.0
	0 DAT	2000 mL/ha	2	2.0	0.0
	3 DAT	1000 g/ha	3	3.0	0.0
			Mean	2.7	0.0
4. Cultivation DUAL GOLD BARON WP	Pre-plant		1	3.0	0.0
	0 DAT	2000 mL/ha	2	3.0	0.0
	3 DAT	1000 g/ha	3	2.0	0.0
			Mean	2.7	0.0
5. Cultivation DUAL GOLD BARON WP	Pre-plant		1	2.0	0.0
	0 DAT	2000 mL/ha	2	2.0	0.0
	3 WAT	500 g/ha	3	2.0	0.0
			Mean	2.0	0.0
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	2.0	0.0
	0 DAT	2000 mL/ha	2	3.0	0.0
	3 DAT	1000 g/ha	3	2.0	0.0
			Mean	2.3	0.0
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	3.0	0.0
	0 DAT	2000 mL/ha	2	3.0	0.0
	3 DAT	1000 g/ha	3	3.0	0.0
			Mean	3.0	0.0
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	3.0	0.0
	0 DAT	2000 mL/ha	2	3.0	0.0
	3 DAT	1000 g/ha	3	3.0	0.0
			Mean	3.0	0.0
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	3.0	0.0
	0 DAT	2000 mL/ha	2	3.0	0.0
	3 DAT	1000 g/ha	3	2.0	0.0
			Mean	2.7	0.0
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	3.0	0.0
	0 DAT	2000 mL/ha	2	2.0	0.0
	3 DAT	1000 g/ha	3	3.0	0.0
			Mean	2.7	0.0

DAT - days after transplanting; WAT - weeks after transplanting



### 11.1.30 Trial 4, Coldstream, Vic, Brussels Sprouts - Crop Vigour (Scale 0 to 100)

Treatment	Application Timing	Rate Prod/ha	Rep	58 DAT 31-Mar-10	70 DAT 12-Apr-10
1. Cultivation	Pre-plant		1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
2. Cultivation Hand Weeding	Pre-plant		1	100.0	100.0
	Post-plant		2	100.0	80.0
			3	100.0	100.0
			Mean	100.0	93.3
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant		1	90.0	90.0
	0 DAT	2000 mL/ha	2	100.0	90.0
	3 DAT	1000 g/ha	3	90.0	90.0
			Mean	93.3	90.0
4. Cultivation DUAL GOLD BARON WP	Pre-plant		1	90.0	90.0
	0 DAT	2000 mL/ha	2	90.0	90.0
	3 DAT	1000 g/ha	3	90.0	80.0
			Mean	90.0	86.7
5. Cultivation DUAL GOLD BARON WP	Pre-plant		1	80.0	90.0
	0 DAT	2000 mL/ha	2	90.0	90.0
	3 WAT	500 g/ha	3	100.0	90.0
			Mean	90.0	90.0
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	80.0	80.0
	0 DAT	2000 mL/ha	2	80.0	70.0
	3 DAT	1000 g/ha	3	90.0	90.0
		150 g/ha	Mean	83.3	80.0
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	80.0	80.0
	0 DAT	2000 mL/ha	2	90.0	90.0
	3 DAT	1000 g/ha	3	80.0	90.0
		250 g/ha	Mean	83.3	86.7
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	90.0	80.0
	0 DAT	2000 mL/ha	2	90.0	90.0
	3 DAT	1000 g/ha	3	80.0	80.0
		150 g/ha (shielded)	Mean	86.7	83.3
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	90.0	90.0
	0 DAT	2000 mL/ha	2	90.0	70.0
	3 DAT	1000 g/ha	3	90.0	90.0
		250 g/ha (shielded)	Mean	90.0	83.3
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	90.0
	0 DAT	2000 mL/ha	2	90.0	100.0
	3 DAT	1000 g/ha	3	100.0	90.0
		500 g/ha (shielded)	Mean	96.7	93.3

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.31 Trial 5, Werribee, Vic, Cauliflower - Marshmallow (*Malva parviflora*) Percentage Weed Control

Treatment	Application Timing	Rate Product per ha	Rep.	26 DAT 22-Mar-10	35 DAT 31-Mar-10	56 DAT 21-Apr-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0
			2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	0.0	0.0	0.0
	Post-plant		2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
3. Cultivation RIFLE 330 BARON WP Inter-row cultivation	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2500 mL/ha	2	100.0	100.0	70.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
			Mean	100.0	100.0	90.0
4. Cultivation RIFLE 330 BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2500 mL/ha	2	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
5. Cultivation RIFLE 330 BARON WP	Pre-plant		1	80.0	100.0	100.0
	0 DAT	2500 mL/ha	2	10.0	95.0	100.0
	3 WAT	500 g/ha	3	20.0	100.0	100.0
			Mean	36.7	98.3	100.0
6. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2500 mL/ha	2	100.0	100.0	80.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
	3 WAT	150 g/ha	Mean	100.0	100.0	93.3
7. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2500 mL/ha	2	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
	3 WAT	250 g/ha	Mean	100.0	100.0	100.0
8. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2500 mL/ha	2	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
	3 WAT	150 g/ha (shielded)	Mean	100.0	100.0	100.0
9. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2500 mL/ha	2	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
	3 WAT	250 g/ha (shielded)	Mean	100.0	100.0	100.0
10. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant		1	0.0	100.0	100.0
	0 DAT	2500 mL/ha	2	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
	3 WAT	500 g/ha (shielded)	Mean	66.7	100.0	100.0
11. Cultivation FRONTIER P	Pre-plant		1	80.0	20.0	80.0
	0 DAT	700 mL/ha	2	50.0	70.0	100.0
			3	30.0	0.0	90.0
			Mean	53.3	30.0	90.0
12. Cultivation FRONTIER-P	Pre-plant		1	40.0	80.0	80.0
	0 DAT	1000 mL/ha	2	100.0	100.0	85.0
			3	100.0	100.0	90.0
			Mean	80.0	93.3	85.0
13. Cultivation FRONTIER-P BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	700 mL/ha	2	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
14. Cultivation RIFLE 330 RAMROD	Pre-plant		1	80.0	10.0	100.0
	Pre-plant/ or 0 DAT	2500 mL/ha	2	80.0	10.0	100.0
	0 DAT	9000 mL/ha	3	50.0	10.0	0.0
			Mean	70.0	10.0	66.7

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.32 Trial 5, Werribee, Vic, Cauliflower - Stinging Nettle (*Urtica urens*) Percentage Weed Control

Treatment	Application Timing	Rate Product per ha	Rep.	26 DAT 22-Mar-10	35 DAT 31-Mar-10	56 DAT 21-Apr-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0
			2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	0.0	0.0	0.0
	Post-plant		2	0.0	0.0	0.0
			3	0.0	0.0	0.0
	Mean			0.0	0.0	0.0
3. Cultivation RIFLE 330 BARON WP Inter-row cultivation	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2500 mL/ha	2	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
	Mean			100.0	100.0	100.0
4. Cultivation RIFLE 330 BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2500 mL/ha	2	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
	Mean			100.0	100.0	100.0
5. Cultivation RIFLE 330 BARON WP	Pre-plant		1	80.0	100.0	100.0
	0 DAT	2500 mL/ha	2	0.0	100.0	100.0
	3 WAT	500 g/ha	3	100.0	100.0	100.0
	Mean			60.0	100.0	100.0
6. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2500 mL/ha	2	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
	3 WAT	150 g/ha	Mean	100.0	100.0	100.0
7. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2500 mL/ha	2	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
	3 WAT	250 g/ha	Mean	100.0	100.0	100.0
8. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2500 mL/ha	2	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
	3 WAT	150 g/ha (shielded)	Mean	100.0	100.0	100.0
9. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2500 mL/ha	2	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
	3 WAT	250 g/ha (shielded)	Mean	100.0	100.0	100.0
10. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2500 mL/ha	2	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
	3 WAT	500 g/ha (shielded)	Mean	100.0	100.0	100.0
11. Cultivation FRONTIER P	Pre-plant		1	100.0	100.0	20.0
	0 DAT	700 mL/ha	2	100.0	100.0	100.0
			3	100.0	100.0	90.0
	Mean			100.0	100.0	70.0
12. Cultivation FRONTIER-P	Pre-plant		1	100.0	100.0	100.0
	0 DAT	1000 mL/ha	2	100.0	100.0	100.0
			3	100.0	100.0	100.0
	Mean			100.0	100.0	100.0
13. Cultivation FRONTIER-P BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	700 mL/ha	2	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0
	Mean			100.0	100.0	100.0
14. Cultivation RIFLE 330 RAMROD	Pre-plant		1	100.0	100.0	80.0
	Pre-plant/ or 0 DAT	2500 mL/ha	2	100.0	100.0	100.0
	0 DAT	9000 mL/ha	3	100.0	100.0	0.0
	Mean			100.0	100.0	60.0

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.33 Trial 5, Werribee, Vic, Cauliflower - Shepherd's Purse (*Capsella bursa-pastoris*) Percentage Weed Control

Treatment	Application Timing	Rate Product per ha	Rep.	26 DAT 22-Mar-10	35 DAT 31-Mar-10	56 DAT 21-Apr-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0
			2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	0.0	0.0	0.0
			2	0.0	0.0	0.0
	Post-plant		3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
3. Cultivation RIFLE 330 BARON WP Inter-row cultivation	Pre-plant	2500 mL/ha	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
		1000 g/ha	3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
4. Cultivation RIFLE 330 BARON WP	Pre-plant	2500 mL/ha	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
		1000 g/ha	3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
5. Cultivation RIFLE 330 BARON WP	Pre-plant	2500 mL/ha	1	80.0	100.0	100.0
			2	10.0	100.0	100.0
		500 g/ha	3	10.0	100.0	100.0
			Mean	33.3	100.0	100.0
6. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant	2500 mL/ha	1	90.0	100.0	100.0
			2	100.0	100.0	100.0
		1000 g/ha	3	100.0	100.0	100.0
			Mean	96.7	100.0	100.0
7. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant	2500 mL/ha	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
		1000 g/ha	3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
8. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant	2500 mL/ha	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
		1000 g/ha	3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
9. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant	2500 mL/ha	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
		1000 g/ha	3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
10. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant	2500 mL/ha	1	0.0	100.0	100.0
			2	100.0	100.0	100.0
		1000 g/ha	3	100.0	100.0	100.0
			Mean	66.7	100.0	100.0
11. Cultivation FRONTIER P	Pre-plant	700 mL/ha	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
		1000 g/ha	3	100.0	100.0	90.0
			Mean	100.0	100.0	96.7
12. Cultivation FRONTIER-P	Pre-plant	1000 mL/ha	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
13. Cultivation FRONTIER-P BARON WP	Pre-plant	700 mL/ha	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
		1000 g/ha	3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
14. Cultivation RIFLE 330 RAMROD	Pre-plant	2500 mL/ha	1	0.0	10.0	80.0
			2	50.0	10.0	70.0
	Pre-plant/ or 0 DAT	9000 mL/ha	3	100.0	10.0	0.0
			Mean	50.0	10.0	50.0

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.34 Trial 5, Werribee, Vic, Cauliflower - Sowthistle (*Sonchus oleraceus*) Percentage Weed Control

Treatment	Application Timing	Rate Product per ha	Rep.	26 DAT 22-Mar-10	35 DAT 31-Mar-10	56 DAT 21-Apr-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0
			2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	0.0	0.0	0.0
	Post-plant		2	0.0	0.0	0.0
			3	0.0	0.0	0.0
	Mean			0.0	0.0	0.0
3. Cultivation RIFLE 330 BARON WP Inter-row cultivation	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2500 mL/ha	2	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
	Mean			100.0	100.0	100.0
4. Cultivation RIFLE 330 BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2500 mL/ha	2	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
	Mean			100.0	100.0	100.0
5. Cultivation RIFLE 330 BARON WP	Pre-plant		1	80.0	100.0	100.0
	0 DAT	2500 mL/ha	2	100.0	100.0	100.0
	3 WAT	500 g/ha	3	100.0	100.0	100.0
	Mean			93.3	100.0	100.0
6. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2500 mL/ha	2	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
	3 WAT	150 g/ha	Mean	100.0	100.0	100.0
7. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2500 mL/ha	2	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
	3 WAT	250 g/ha	Mean	100.0	100.0	100.0
8. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2500 mL/ha	2	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
	3 WAT	150 g/ha (shielded)	Mean	100.0	100.0	100.0
9. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2500 mL/ha	2	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
	3 WAT	250 g/ha (shielded)	Mean	100.0	100.0	100.0
10. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant		1	100.0	100.0	80.0
	0 DAT	2500 mL/ha	2	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
	3 WAT	500 g/ha (shielded)	Mean	100.0	100.0	93.3
11. Cultivation FRONTIER P	Pre-plant		1	100.0	100.0	80.0
	0 DAT	700 mL/ha	2	100.0	100.0	100.0
			3	100.0	100.0	90.0
	Mean			100.0	100.0	90.0
12. Cultivation FRONTIER-P	Pre-plant		1	100.0	100.0	100.0
	0 DAT	1000 mL/ha	2	100.0	100.0	100.0
			3	100.0	100.0	100.0
	Mean			100.0	100.0	100.0
13. Cultivation FRONTIER-P BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	700 mL/ha	2	100.0	100.0	100.0
	3 DAT	1000 g/ha	3	100.0	100.0	100.0
	Mean			100.0	100.0	100.0
14. Cultivation RIFLE 330 RAMROD	Pre-plant		1	100.0	100.0	100.0
	Pre-plant/ or 0 DAT	2500 mL/ha	2	100.0	100.0	100.0
	0 DAT	9000 mL/ha	3	100.0	100.0	100.0
	Mean			100.0	100.0	100.0

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.35 Trial 5, Werribee, Vic, Cauliflower - Groundsel (*Senecio* sp) Percentage Weed Control

Treatment	Application Timing	Rate Product per ha	Rep.	26 DAT 22-Mar-10	35 DAT 31-Mar-10	56 DAT 21-Apr-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0
			2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	0.0	0.0	0.0
			2	0.0	0.0	0.0
	Post-plant		3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
3. Cultivation RIFLE 330 BARON WP Inter-row cultivation	Pre-plant	2500 mL/ha	1	100.0	100.0	100.0
			2	100.0	100.0	70.0
		1000 g/ha	3	100.0	100.0	100.0
			Mean	100.0	100.0	90.0
4. Cultivation RIFLE 330 BARON WP	Pre-plant	2500 mL/ha	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
		1000 g/ha	3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
5. Cultivation RIFLE 330 BARON WP	Pre-plant	2500 mL/ha	1	80.0	100.0	100.0
			2	10.0	100.0	100.0
		500 g/ha	3	10.0	100.0	100.0
			Mean	33.3	100.0	100.0
6. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant	2500 mL/ha	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
		1000 g/ha	3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
7. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant	2500 mL/ha	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
		1000 g/ha	3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
8. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant	2500 mL/ha	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
		1000 g/ha	3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
9. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant	2500 mL/ha	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
		1000 g/ha	3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
10. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant	2500 mL/ha	1	0.0	90.0	100.0
			2	100.0	100.0	100.0
		1000 g/ha	3	100.0	100.0	100.0
			Mean	66.7	96.7	100.0
11. Cultivation FRONTIER P	Pre-plant	700 mL/ha	1	10.0	100.0	80.0
			2	90.0	90.0	100.0
		1000 g/ha	3	80.0	100.0	90.0
			Mean	60.0	96.7	90.0
12. Cultivation FRONTIER-P	Pre-plant	1000 mL/ha	1	100.0	100.0	80.0
			2	100.0	100.0	100.0
		1000 g/ha	3	100.0	100.0	100.0
			Mean	100.0	100.0	93.3
13. Cultivation FRONTIER-P BARON WP	Pre-plant	700 mL/ha	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
		1000 g/ha	3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
14. Cultivation RIFLE 330 RAMROD	Pre-plant	2500 mL/ha	1	20.0	80.0	80.0
			2	20.0	90.0	100.0
	Pre-plant/ or 0 DAT	9000 mL/ha	3	20.0	90.0	0.0
			Mean	20.0	86.7	60.0

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.36 Trial 5, Werribee, Vic, Cauliflower - Percentage Crop Phytotoxicity

Treatment	Application Timing	Rate Product per ha	Rep.	26 DAT 22-Mar-10	35 DAT 31-Mar-10	56 DAT 21-Apr-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0
			2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	0.0	0.0	0.0
			2	0.0	0.0	0.0
	Post-plant		3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
3. Cultivation RIFLE 330 BARON WP Inter-row cultivation	Pre-plant	2500 mL/ha 1000 g/ha	1	5.0	0.0	0.0
			2	5.0	0.0	0.0
			3	5.0	0.0	0.0
			Mean	5.0	0.0	0.0
4. Cultivation RIFLE 330 BARON WP	Pre-plant	2500 mL/ha 1000 g/ha	1	10.0	0.0	0.0
			2	10.0	0.0	0.0
			3	10.0	0.0	0.0
			Mean	10.0	0.0	0.0
5. Cultivation RIFLE 330 BARON WP	Pre-plant	2500 mL/ha 500 g/ha	1	5.0	0.0	0.0
			2	2.5	0.0	0.0
			3	2.5	0.0	0.0
			Mean	3.3	0.0	0.0
6. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant	2500 mL/ha 1000 g/ha 150 g/ha	1	10.0	0.0	0.0
			2	5.0	0.0	0.0
			3	10.0	0.0	0.0
			Mean	8.3	0.0	0.0
7. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant	2500 mL/ha 1000 g/ha 250 g/ha	1	10.0	0.0	0.0
			2	10.0	0.0	0.0
			3	10.0	0.0	0.0
			Mean	10.0	0.0	0.0
8. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant	2500 mL/ha 1000 g/ha 150 g/ha (shielded)	1	5.0	0.0	0.0
			2	10.0	0.0	0.0
			3	5.0	0.0	0.0
			Mean	6.7	0.0	0.0
9. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant	2500 mL/ha 1000 g/ha 250 g/ha (shielded)	1	10.0	0.0	0.0
			2	10.0	0.0	0.0
			3	10.0	0.0	0.0
			Mean	10.0	0.0	0.0
10. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant	2500 mL/ha 1000 g/ha 500 g/ha (shielded)	1	2.5	0.0	0.0
			2	10.0	0.0	0.0
			3	5.0	0.0	0.0
			Mean	5.8	0.0	0.0
11. Cultivation FRONTIER P	Pre-plant	700 mL/ha	1	2.5	0.0	0.0
			2	2.5	0.0	0.0
			3	2.5	0.0	0.0
			Mean	2.5	0.0	0.0
12. Cultivation FRONTIER-P	Pre-plant	1000 mL/ha	1	2.5	0.0	0.0
			2	2.5	0.0	0.0
			3	5.0	0.0	0.0
			Mean	3.3	0.0	0.0
13. Cultivation FRONTIER-P BARON WP	Pre-plant	700 mL/ha 1000 g/ha	1	5.0	0.0	0.0
			2	10.0	0.0	0.0
			3	5.0	0.0	0.0
			Mean	6.7	0.0	0.0
14. Cultivation RIFLE 330 RAMROD	Pre-plant	2500 mL/ha 9000 mL/ha	1	2.5	0.0	0.0
			2	2.5	0.0	0.0
			3	2.5	0.0	0.0
			Mean	2.5	0.0	0.0

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.37 Trial 5, Werribee, Vic, Cauliflower - Crop Vigour (Scale 0-100)

Treatment	Application Timing	Rate Product per ha	Rep.	26 DAT 22-Mar-10	35 DAT 31-Mar-10	56 DAT 21-Apr-10
1. Cultivation	Pre-plant		1	100.0	100.0	100.0
			2	100.0	80.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	93.3	100.0
2. Cultivation Hand Weeding	Pre-plant		1	100.0	100.0	100.0
			2	100.0	80.0	100.0
	Post-plant		3	100.0	100.0	100.0
			Mean	100.0	93.3	100.0
3. Cultivation RIFLE 330 BARON WP Inter-row cultivation	Pre-plant	2500 mL/ha	1	100.0	80.0	90.0
			2	100.0	80.0	90.0
		1000 g/ha	3	100.0	80.0	80.0
			Mean	100.0	80.0	86.7
4. Cultivation RIFLE 330 BARON WP	Pre-plant	2500 mL/ha	1	100.0	80.0	100.0
			2	100.0	60.0	80.0
		1000 g/ha	3	100.0	80.0	90.0
			Mean	100.0	73.3	90.0
5. Cultivation RIFLE 330 BARON WP	Pre-plant	2500 mL/ha	1	100.0	90.0	100.0
			2	100.0	90.0	90.0
		500 g/ha	3	100.0	90.0	90.0
			Mean	100.0	90.0	93.3
6. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant	2500 mL/ha	1	100.0	60.0	90.0
			2	100.0	80.0	90.0
		1000 g/ha	3	100.0	40.0	90.0
			Mean	100.0	60.0	90.0
7. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant	2500 mL/ha	1	100.0	70.0	100.0
			2	100.0	60.0	90.0
		1000 g/ha	3	100.0	80.0	100.0
			Mean	100.0	70.0	96.7
8. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant	2500 mL/ha	1	100.0	80.0	90.0
			2	100.0	70.0	90.0
		1000 g/ha	3	100.0	80.0	90.0
			Mean	100.0	76.7	90.0
9. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant	2500 mL/ha	1	100.0	60.0	90.0
			2	100.0	60.0	90.0
		1000 g/ha	3	100.0	70.0	80.0
			Mean	100.0	63.3	86.7
10. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant	2500 mL/ha	1	100.0	70.0	100.0
			2	100.0	50.0	90.0
		1000 g/ha	3	100.0	80.0	90.0
			Mean	100.0	66.7	93.3
11. Cultivation FRONTIER P	Pre-plant	700 mL/ha	1	100.0	50.0	80.0
			2	100.0	60.0	90.0
			3	100.0	50.0	80.0
			Mean	100.0	53.3	83.3
12. Cultivation FRONTIER-P	Pre-plant	1000 mL/ha	1	100.0	40.0	80.0
			2	100.0	40.0	80.0
			3	100.0	40.0	80.0
			Mean	100.0	40.0	80.0
13. Cultivation FRONTIER-P BARON WP	Pre-plant	700 mL/ha	1	100.0	40.0	80.0
			2	100.0	40.0	90.0
		1000 g/ha	3	100.0	40.0	80.0
			Mean	100.0	40.0	83.3
14. Cultivation RIFLE 330 RAMROD	Pre-plant	2500 mL/ha	1	100.0	90.0	100.0
			2	100.0	70.0	90.0
		9000 mL/ha	3	100.0	90.0	100.0
			Mean	100.0	83.3	96.7

DAT - days after transplanting; WAT - weeks after transplanting



### 11.1.38 Trial 5, Werribee, Vic, Cauliflower - Weed by Species at 35 DAT per 0.1m<sup>2</sup> Plot

Treatment	Application Timing	Rate Product per ha	Rep.	Marshmallow 31-Mar-10	Stinging Nettle 31-Mar-10	Shepherd purse 31-Mar-10	Groundsel 31-Mar-10	Sowthistle 31-Mar-10
1. Cultivation	Pre-plant		1	0.5	0.1	0.4	0.06	0.12
			2	0.2	0.0	0.1	0.02	0.26
			3	0.5	0.0	0.2	0.00	0.44
			Mean	0.4	0.0	0.2	0.03	0.27
2. Cultivation Hand Weeding	Pre-plant		1	0.4	0.2	0.6	0.00	0.26
			2	0.2	0.0	0.0	0.02	0.10
	Post-plant		3	0.4	0.0	0.4	0.00	0.38
			Mean	0.3	0.1	0.3	0.01	0.25
3. Cultivation RIFLE 330 BARON WP Inter-row cultivation	Pre-plant 0 DAT 2 DAT	2500 mL/ha 1000 g/ha	1	0.0	0.0	0.0	0.00	0.00
			2	0.0	0.0	0.0	0.00	0.00
			3	0.0	0.0	0.0	0.00	0.00
			Mean	0.0	0.0	0.0	0.00	0.00
4. Cultivation RIFLE 330 BARON WP	Pre-plant 0 DAT 2 DAT	2500 mL/ha 1000 g/ha	1	0.0	0.0	0.0	0.00	0.00
			2	0.0	0.0	0.0	0.00	0.00
			3	0.0	0.0	0.0	0.00	0.00
			Mean	0.0	0.0	0.0	0.00	0.00
5. Cultivation RIFLE 330 BARON WP	Pre-plant 0 DAT 3 WAT	2500 mL/ha 500 g/ha	1	0.0	0.0	0.0	0.00	0.06
			2	0.0	0.0	0.0	0.00	0.04
			3	0.0	0.0	0.0	0.00	0.00
			Mean	0.0	0.0	0.0	0.00	0.03
6. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2500 mL/ha 1000 g/ha 150 g/ha	1	0.0	0.0	0.0	0.00	0.00
			2	0.0	0.0	0.0	0.00	0.00
			3	0.0	0.0	0.0	0.00	0.00
			Mean	0.0	0.0	0.0	0.00	0.00
7. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2500 mL/ha 1000 g/ha 250 g/ha	1	0.0	0.0	0.0	0.00	0.00
			2	0.0	0.0	0.0	0.00	0.00
			3	0.0	0.0	0.0	0.00	0.00
			Mean	0.0	0.0	0.0	0.00	0.00
8. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2500 mL/ha 1000 g/ha 150 g/ha (shielded)	1	0.0	0.0	0.0	0.00	0.00
			2	0.0	0.0	0.0	0.00	0.00
			3	0.0	0.0	0.0	0.00	0.00
			Mean	0.0	0.0	0.0	0.00	0.00
9. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2500 mL/ha 1000 g/ha 250 g/ha (shielded)	1	0.0	0.0	0.0	0.00	0.00
			2	0.0	0.0	0.0	0.00	0.00
			3	0.0	0.0	0.0	0.00	0.00
			Mean	0.0	0.0	0.0	0.00	0.00
10. Cultivation RIFLE 330 BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2500 mL/ha 1000 g/ha 500 g/ha (shielded)	1	0.0	0.0	0.0	0.00	0.14
			2	0.0	0.0	0.0	0.00	0.00
			3	0.0	0.0	0.0	0.00	0.00
			Mean	0.0	0.0	0.0	0.00	0.05
11. Cultivation FRONTIER P	Pre-plant 0 DAT	700 mL/ha	1	0.1	0.0	0.0	0.00	0.14
			2	0.1	0.0	0.0	0.00	0.02
			3	0.2	0.0	0.0	0.00	0.00
			Mean	0.1	0.0	0.0	0.00	0.05
12. Cultivation FRONTIER-P	Pre-plant 0 DAT	1000 mL/ha	1	0.1	0.0	0.0	0.00	0.02
			2	0.0	0.0	0.0	0.00	0.00
			3	0.0	0.0	0.0	0.00	0.00
			Mean	0.0	0.0	0.0	0.00	0.01
13. Cultivation FRONTIER-P BARON WP	Pre-plant 0 DAT 3 DAT	700 mL/ha 1000 g/ha	1	0.0	0.0	0.0	0.00	0.00
			2	0.0	0.0	0.0	0.00	0.00
			3	0.0	0.0	0.0	0.00	0.00
			Mean	0.0	0.0	0.0	0.00	0.00
14. Cultivation RIFLE 330 RAMROD	Pre-plant Pre-plant/ or 0 DAT 0 DAT	2500 mL/ha 9000 mL/ha	1	0.2	0.0	0.1	0.00	0.58
			2	0.2	0.0	0.1	0.00	0.08
			3	0.0	0.0	0.0	0.00	0.10
			Mean	0.1	0.0	0.1	0.00	0.25

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.39 Trial 6, Devonport, Tas, Broccoli - Shepherd's Purse (*Capsella bursa-pastoris*) Percentage Weed Control

Treatment	Application Timing	Rate Prod/ha	Rep	22 DAT 26-Mar-10	36 DAT 09-Apr-10	50 DAT 23-Apr-10	63 DAT 06-May-10
1. Cultivation	Pre-plant		1	0.00	0.00	0.00	0.00
			2	0.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
2. Cultivation Hand Weeding	Pre-plant		1	100.00	100.00	100.00	100.00
	Post-plant		2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00	99.00
			Mean	100.00	100.00	100.00	99.67
4. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	99.00	100.00	100.00
			Mean	100.00	99.67	100.00	100.00
5. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	80.00	100.00	100.00	100.00
	3 WAT	500 g/ha	3	100.00	100.00	100.00	100.00
			Mean	93.33	100.00	100.00	100.00
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00	100.00
	3 WAT	150 g/ha	Mean	100.00	100.00	100.00	100.00
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	-	-	-	-
	3 WAT	250 g/ha	Mean	100.00	100.00	100.00	100.00
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00	100.00
	3 WAT	150 g/ha (shielded)	Mean	100.00	100.00	100.00	100.00
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00	100.00
	3 WAT	250 g/ha (shielded)	Mean	100.00	100.00	100.00	100.00
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00	100.00
	3 WAT	500 g/ha (shielded)	Mean	100.00	100.00	100.00	100.00
11. Cultivation FRONTIER-P	Pre-plant		1	100.00	90.00	90.00	90.00
	0 DAT	700 mL/ha	2	80.00	100.00	80.00	50.00
			3	80.00	100.00	99.00	85.00
			Mean	86.67	96.67	89.67	75.00
12. Cultivation FRONTIER-P	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	1000 mL/ha	2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	99.00
			Mean	100.00	100.00	100.00	99.67
13. Cultivation FRONTIER-P BARON WP	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	700 mL/ha	2	100.00	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00	100.00
			Mean				

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.40 Trial 6, Devonport, Tas, Broccoli - Blackberry Nightshade (*Solanum nigrum*) Percentage Weed Control

Treatment	Application Timing	Rate Prod/ha	Rep	22 DAT 26-Mar-10	36 DAT 09-Apr-10	50 DAT 23-Apr-10	63 DAT 06-May-10
1. Cultivation	Pre-plant		1	0.00	0.00	0.00	0.00
			2	0.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
2. Cultivation Hand Weeding	Pre-plant		1	100.00	100.00	100.00	100.00
	Post-plant		2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00	99.00
			Mean	100.00	100.00	100.00	99.67
4. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	99.00	100.00	100.00
			Mean	100.00	99.67	100.00	100.00
5. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	80.00	100.00	100.00	100.00
	3 WAT	500 g/ha	3	100.00	100.00	100.00	100.00
			Mean	93.33	100.00	100.00	100.00
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00	100.00
	3 WAT	150 g/ha	Mean	100.00	100.00	100.00	100.00
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	-	-	-	-
	3 WAT	250 g/ha	Mean	100.00	100.00	100.00	100.00
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00	100.00
	3 WAT	150 g/ha (shielded)	Mean	100.00	100.00	100.00	100.00
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00	100.00
	3 WAT	250 g/ha (shielded)	Mean	100.00	100.00	100.00	100.00
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00	100.00
	3 WAT	500 g/ha (shielded)	Mean	100.00	100.00	100.00	100.00
11. Cultivation FRONTIER-P	Pre-plant		1	100.00	90.00	90.00	90.00
	0 DAT	700 mL/ha	2	80.00	100.00	80.00	50.00
			3	80.00	100.00	99.00	85.00
			Mean	86.67	96.67	89.67	75.00
12. Cultivation FRONTIER-P	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	1000 mL/ha	2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	99.00
			Mean	100.00	100.00	100.00	99.67
13. Cultivation FRONTIER-P BARON WP	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	700 mL/ha	2	100.00	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.41 Trial 6, Devonport, Tas, Broccoli - Fat Hen (*Chenopodium album*) Percentage Weed Control

Treatment	Application Timing	Rate Prod/ha	Rep	22 DAT 26-Mar-10	36 DAT 09-Apr-10	50 DAT 23-Apr-10	63 DAT 06-May-10
1. Cultivation	Pre-plant		1	0.00	0.00	0.00	0.00
			2	0.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
2. Cultivation Hand Weeding	Pre-plant		1	100.00	100.00	100.00	100.00
	Post-plant		2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant		1	100.00	99.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00	100.00
			Mean	100.00	99.67	100.00	100.00
4. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	95.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00	99.00
			Mean	100.00	100.00	98.33	99.67
5. Cultivation DUAL GOLD BARON WP	Pre-plant		1	70.00	95.00	98.00	99.00
	0 DAT	2000 mL/ha	2	60.00	75.00	100.00	70.00
	3 WAT	500 g/ha	3	70.00	60.00	95.00	90.00
			Mean	66.67	76.67	97.67	86.33
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00	100.00
	3 WAT	150 g/ha	Mean	100.00	100.00	100.00	100.00
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	-	-	-	-
	3 WAT	250 g/ha	Mean	100.00	100.00	100.00	100.00
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	99.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00	100.00
	3 WAT	150 g/ha (shielded)	Mean	100.00	99.67	100.00	100.00
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00	100.00
	3 WAT	250 g/ha (shielded)	Mean	100.00	100.00	100.00	100.00
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	2000 mL/ha	2	100.00	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00	100.00
	3 WAT	500 g/ha (shielded)	Mean	100.00	100.00	100.00	100.00
11. Cultivation FRONTIER-P	Pre-plant		1	70.00	60.00	80.00	70.00
	0 DAT	700 mL/ha	2	60.00	65.00	80.00	80.00
			3	60.00	70.00	75.00	75.00
			Mean	63.33	65.00	78.33	75.00
12. Cultivation FRONTIER-P	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	1000 mL/ha	2	100.00	100.00	100.00	100.00
			3	80.00	70.00	90.00	90.00
			Mean	93.33	90.00	96.67	96.67
13. Cultivation FRONTIER-P BARON WP	Pre-plant		1	100.00	100.00	100.00	100.00
	0 DAT	700 mL/ha	2	100.00	100.00	100.00	100.00
	3 DAT	1000 g/ha	3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.42 Trial 6, Devonport, Tas, Broccoli - Opium Poppy (*Papaver somniferum*) Percentage Weed Control

Treatment	Application Timing	Rate Prod/ha	Rep	22 DAT 26-Mar-10	36 DAT 09-Apr-10	50 DAT 23-Apr-10	63 DAT 06-May-10
1. Cultivation	Pre-plant		1	0.00	0.00	0.00	0.00
			2	0.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
2. Cultivation Hand Weeding	Pre-plant		1	0.00	0.00	0.00	100.00
	Post-plant		2	0.00	0.00	0.00	100.00
			3	0.00	0.00	0.00	100.00
			Mean	0.00	0.00	0.00	100.00
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant		1	0.00	0.00	0.00	100.00
	0 DAT	2000 mL/ha	2	0.00	0.00	0.00	100.00
	3 DAT	1000 g/ha	3	0.00	0.00	0.00	100.00
			Mean	0.00	0.00	0.00	100.00
4. Cultivation DUAL GOLD BARON WP	Pre-plant		1	0.00	0.00	0.00	100.00
	0 DAT	2000 mL/ha	2	0.00	0.00	0.00	100.00
	3 DAT	1000 g/ha	3	0.00	0.00	0.00	100.00
			Mean	0.00	0.00	0.00	100.00
5. Cultivation DUAL GOLD BARON WP	Pre-plant		1	0.00	0.00	0.00	100.00
	0 DAT	2000 mL/ha	2	0.00	0.00	0.00	100.00
	3 WAT	500 g/ha	3	0.00	0.00	0.00	100.00
			Mean	0.00	0.00	0.00	100.00
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	0.00	0.00	0.00	100.00
	0 DAT	2000 mL/ha	2	0.00	0.00	0.00	100.00
	3 DAT	1000 g/ha	3	0.00	0.00	0.00	100.00
	3 WAT	150 g/ha	Mean	0.00	0.00	0.00	100.00
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	0.00	0.00	0.00	100.00
	0 DAT	2000 mL/ha	2	0.00	0.00	0.00	100.00
	3 DAT	1000 g/ha	3	0.00	0.00	0.00	-
	3 WAT	250 g/ha	Mean	0.00	0.00	0.00	100.00
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	0.00	0.00	0.00	100.00
	0 DAT	2000 mL/ha	2	0.00	0.00	0.00	100.00
	3 DAT	1000 g/ha	3	0.00	0.00	0.00	100.00
	3 WAT	150 g/ha (shielded)	Mean	0.00	0.00	0.00	100.00
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	0.00	0.00	0.00	100.00
	0 DAT	2000 mL/ha	2	0.00	0.00	0.00	100.00
	3 DAT	1000 g/ha	3	0.00	0.00	0.00	100.00
	3 WAT	250 g/ha (shielded)	Mean	0.00	0.00	0.00	100.00
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	0.00	0.00	0.00	100.00
	0 DAT	2000 mL/ha	2	0.00	0.00	0.00	100.00
	3 DAT	1000 g/ha	3	0.00	0.00	0.00	100.00
	3 WAT	500 g/ha (shielded)	Mean	0.00	0.00	0.00	100.00
11. Cultivation FRONTIER-P	Pre-plant		1	0.00	0.00	0.00	50.00
	0 DAT	700 mL/ha	2	0.00	0.00	0.00	90.00
			3	0.00	0.00	0.00	100.00
			Mean	0.00	0.00	0.00	80.00
12. Cultivation FRONTIER-P	Pre-plant		1	0.00	0.00	0.00	100.00
	0 DAT	1000 mL/ha	2	0.00	0.00	0.00	100.00
			3	0.00	0.00	0.00	98.00
			Mean	0.00	0.00	0.00	99.33
13. Cultivation FRONTIER-P BARON WP	Pre-plant		1	0.00	0.00	0.00	100.00
	0 DAT	700 mL/ha	2	0.00	0.00	0.00	100.00
	3 DAT	1000 g/ha	3	0.00	0.00	0.00	100.00
			Mean	0.00	0.00	0.00	100.00

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.43 Trial 6, Devonport, Tas, Broccoli -Weed by Species at 36 DAT per 0.1m<sup>2</sup> Plot

Treatment	Application Timing	Rate Prod/ha	Rep	Fat Hen 09-Apr-10	Blackberry Nighthshade 09-Apr-10	Shepherd's Pursue 09-Apr-10	Opium Poppy 09-Apr-10
1. Cultivation	Pre-plant		1	6.00	14.00	2.00	6.00
			2	1.00	11.00	3.00	1.00
			3	7.00	8.00	1.00	0.00
			Mean	4.67	11.00	2.00	2.33
2. Cultivation Hand Weeding	Pre-plant		1	0.00	0.00	0.00	0.00
			2	0.00	0.00	0.00	0.00
	Post-plant		3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant	2000 mL/ha 1000 g/ha	1	0.00	0.00	0.00	0.00
			2	0.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
4. Cultivation DUAL GOLD BARON WP	Pre-plant	2000 mL/ha 1000 g/ha	1	0.00	0.00	0.00	0.00
			2	0.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
5. Cultivation DUAL GOLD BARON WP	Pre-plant	2000 mL/ha 500 g/ha	1	0.00	0.00	0.00	0.00
			2	2.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
			Mean	0.67	0.00	0.00	0.00
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 150 g/ha	1	0.00	0.00	0.00	0.00
			2	0.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 250 g/ha	1	0.00	0.00	0.00	0.00
			2	0.00	0.00	0.00	0.00
			3	-	-	-	-
			Mean	0.00	0.00	0.00	0.00
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 150 g/ha (shielded)	1	0.00	0.00	0.00	0.00
			2	0.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 250 g/ha (shielded)	1	0.00	0.00	0.00	0.00
			2	0.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 500 g/ha (shielded)	1	0.00	0.00	0.00	0.00
			2	0.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
11. Cultivation FRONTIER-P	Pre-plant	700 mL/ha	1	5.00	2.00	0.00	2.00
			2	3.00	3.00	0.00	1.00
			3	1.00	2.00	0.00	0.00
			Mean	3.00	2.33	0.00	1.00
12. Cultivation FRONTIER-P	Pre-plant	1000 mL/ha	1	0.00	0.00	0.00	0.00
			2	0.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
13. Cultivation FRONTIER-P BARON WP	Pre-plant	700 mL/ha 1000 g/ha	1	0.00	0.00	0.00	0.00
			2	0.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.44 Trial 7, Nairne, SA, Brussels Sprouts - Wireweed (*Polygonum aviculare*) Percentage Weed Control

Treatment	Application Timing	Rate Prod/ha	Rep	28 DAT 19-Feb-10	59 DAT 24-Mar-10	63 DAT 01-Apr-10	77 DAT 15-Apr-10
1. Cultivation	Pre-plant		1	0.00	0.00	0.00	0.00
			2	0.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
2. Cultivation Hand Weeding	Pre-plant Post-plant		1	100.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant 0 DAT 3 DAT	1500 mL/ha 1000 g/ha	1	95.00	97.00	96.00	96.00
			2	95.00	95.00	96.00	95.00
			3	96.00	94.00	95.00	94.00
			Mean	95.33	95.33	95.67	95.00
4. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 DAT	1500 mL/ha 1000 g/ha	1	96.00	95.00	95.00	94.00
			2	90.00	95.00	92.00	95.00
			3	92.00	95.00	94.00	93.00
			Mean	92.67	95.00	93.67	94.00
5. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 WAT	1500 mL/ha 500g/ha	1	90.00	95.00	100.00	100.00
			2	90.00	90.00	95.00	98.00
			3	88.00	90.00	95.00	100.00
			Mean	89.33	91.67	96.67	99.33
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 150 g/ha	1	95.00	98.00	100.00	100.00
			2	95.00	95.00	100.00	100.00
			3	94.00	98.00	99.00	99.00
			Mean	94.67	97.00	99.67	99.67
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 250 g/ha	1	95.00	99.00	100.00	100.00
			2	96.00	98.00	99.00	100.00
			3	93.00	95.00	98.00	100.00
			Mean	94.67	97.33	99.00	100.00
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 150 g/ha (shielded)	1	95.00	98.00	100.00	100.00
			2	96.00	98.00	98.00	100.00
			3	92.00	98.00	100.00	100.00
			Mean	94.33	98.00	99.33	100.00
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 250 g/ha (shielded)	1	94.00	99.00	100.00	100.00
			2	96.00	98.00	98.00	100.00
			3	98.00	100.00	100.00	100.00
			Mean	96.00	99.00	99.33	100.00
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 500 g/ha (shielded)	1	98.00	100.00	100.00	100.00
			2	96.00	98.00	100.00	100.00
			3	95.00	96.00	98.00	99.00
			Mean	96.33	98.00	99.33	99.67
11. Cultivation FRONTIER-P	Pre-plant 0 DAT	700 mL/ha	1	94.00	96.00	96.00	95.00
			2	95.00	95.00	96.00	94.00
			3	96.00	98.00	98.00	100.00
			Mean	95.00	96.33	96.67	96.33
12. Cultivation FRONTIER-P	Pre-plant 0 DAT	1000 mL/ha	1	96.00	98.00	98.00	96.00
			2	95.00	95.00	96.00	98.00
			3	98.00	96.00	98.00	100.00
			Mean	96.33	96.33	97.33	98.00
13. Cultivation FRONTIER-P BARON WP	Pre-plant 0 DAT 3 DAT	700 mL/ha 1000 g/ha	1	100.00	97.00	100.00	100.00
			2	100.00	96.00	98.00	100.00
			3	100.00	98.00	99.00	98.00
			Mean	100.00	97.00	99.00	99.33

DAT - days after transplanting; WAT - weeks after transplanting

**11.1.45 Trial 7, Nairne, SA, Brussels Sprouts - Fat Hen (*Chenopodium album*)  
Percentage Weed Control**

Treatment	Application Timing	Rate Prod/ha	Rep	28 DAT 19-Feb-10	59 DAT 24-Mar-10	63 DAT 01-Apr-10	77 DAT 15-Apr-10
1. Cultivation	Pre-plant		1	0.00	0.00	0.00	0.00
			2	0.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
2. Cultivation Hand Weeding	Pre-plant Post-plant		1	100.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant 0 DAT 3 DAT	1500 mL/ha 1000 g/ha	1	97.00	98.00	98.00	98.00
			2	96.00	96.00	97.00	97.00
			3	95.00	95.00	95.00	96.00
			Mean	96.00	96.33	96.67	97.00
4. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 DAT	1500 mL/ha 1000 g/ha	1	98.00	100.00	98.00	98.00
			2	95.00	94.00	94.00	95.00
			3	94.00	95.00	95.00	98.00
			Mean	95.67	96.33	95.67	97.00
5. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 WAT	1500 mL/ha 500g/ha	1	93.00	95.00	100.00	100.00
			2	95.00	96.00	96.00	98.00
			3	93.00	95.00	98.00	100.00
			Mean	93.67	95.33	98.00	99.33
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 150 g/ha	1	98.00	100.00	100.00	100.00
			2	98.00	98.00	100.00	100.00
			3	96.00	98.00	100.00	100.00
			Mean	97.33	98.67	100.00	100.00
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 250 g/ha	1	95.00	100.00	100.00	100.00
			2	98.00	98.00	100.00	100.00
			3	95.00	95.00	100.00	100.00
			Mean	96.00	97.67	100.00	100.00
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 150 g/ha (shielded)	1	95.00	100.00	100.00	100.00
			2	98.00	100.00	100.00	100.00
			3	95.00	100.00	100.00	100.00
			Mean	96.00	100.00	100.00	100.00
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 250 g/ha (shielded)	1	95.00	100.00	100.00	100.00
			2	98.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	97.67	100.00	100.00	100.00
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 500 g/ha (shielded)	1	100.00	100.00	100.00	100.00
			2	97.00	100.00	100.00	100.00
			3	96.00	98.00	98.00	100.00
			Mean	97.67	99.33	99.33	100.00
11. Cultivation FRONTIER-P	Pre-plant 0 DAT	700 mL/ha	1	98.00	98.00	98.00	97.00
			2	96.00	96.00	96.00	95.00
			3	98.00	100.00	99.00	100.00
			Mean	97.33	98.00	97.67	97.33
12. Cultivation FRONTIER-P	Pre-plant 0 DAT	1000 mL/ha	1	98.00	98.00	100.00	100.00
			2	96.00	96.00	98.00	100.00
			3	100.00	98.00	98.00	100.00
			Mean	98.00	97.33	98.67	100.00
13. Cultivation FRONTIER-P BARON WP	Pre-plant 0 DAT 3 DAT	700 mL/ha 1000 g/ha	1	100.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00

DAT - days after transplanting; WAT - weeks after transplanting



**11.1.46 Trial 7, Nairne, SA, Brussels Sprouts - Capeweed (*Arctotheca calendula*)  
Percentage Weed Control**

Treatment	Application Timing	Rate Prod/ha	Rep	28 DAT 19-Feb-10	59 DAT 24-Mar-10	63 DAT 01-Apr-10	77 DAT 15-Apr-10
1. Cultivation	Pre-plant		1	0.00	0.00	0.00	0.00
			2	0.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
2. Cultivation Hand Weeding	Pre-plant Post-plant		1	100.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant 0 DAT 3 DAT	1500 mL/ha 1000 g/ha	1	98.00	96.00	96.00	97.00
			2	100.00	98.00	97.00	98.00
			3	98.00	95.00	95.00	95.00
			Mean	98.67	96.33	96.00	96.67
4. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 DAT	1500 mL/ha 1000 g/ha	1	98.00	97.00	95.00	96.00
			2	99.00	98.00	98.00	95.00
			3	96.00	98.00	95.00	95.00
			Mean	97.67	97.67	96.00	95.33
5. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 WAT	1500 mL/ha 500g/ha	1	95.00	100.00	100.00	100.00
			2	92.00	100.00	100.00	100.00
			3	96.00	98.00	100.00	100.00
			Mean	94.33	99.33	100.00	100.00
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 150 g/ha	1	100.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 250 g/ha	1	100.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 150 g/ha (shielded)	1	100.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 250 g/ha (shielded)	1	100.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 500 g/ha (shielded)	1	100.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00
11. Cultivation FRONTIER-P	Pre-plant 0 DAT	700 mL/ha	1	98.00	96.00	98.00	95.00
			2	98.00	98.00	96.00	96.00
			3	95.00	98.00	98.00	100.00
			Mean	97.00	97.33	97.33	97.00
12. Cultivation FRONTIER-P	Pre-plant 0 DAT	1000 mL/ha	1	98.00	98.00	100.00	100.00
			2	96.00	96.00	99.00	100.00
			3	98.00	99.00	100.00	100.00
			Mean	97.33	97.67	99.67	100.00
13. Cultivation FRONTIER-P BARON WP	Pre-plant 0 DAT 3 DAT	700 mL/ha 1000 g/ha	1	100.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00

DAT - days after transplanting; WAT - weeks after transplanting

**11.1.47 Trial 7, Nairne, SA, Brussels Sprouts -Weed by Species at 63 DAT per 1m<sup>2</sup>**

Treatment	Application Timing	Rate Prod/ha	Rep	Wireweed 01-Apr-10	Fat Hen 01-Apr-10	Capweed 01-Apr-10
1. Cultivation	Pre-plant		1	12.00	5.40	8.80
			2	9.40	3.90	6.50
			3	21.60	8.90	13.30
			Mean	14.33	6.07	9.53
2. Cultivation Hand Weeding	Pre-plant Post-plant		1	0.00	0.00	0.00
			2	0.00	0.00	0.00
			3	0.00	0.00	0.00
			Mean	0.00	0.00	0.00
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant 0 DAT 3 DAT	1500 mL/ha 1000 g/ha	1	1.90	0.40	0.90
			2	2.10	1.20	1.30
			3	2.90	1.40	1.70
			Mean	2.30	1.00	1.30
4. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 DAT	1500 mL/ha 1000 g/ha	1	2.30	0.60	1.40
			2	3.40	1.80	1.10
			3	2.40	1.50	1.60
			Mean	2.70	1.30	1.37
5. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 WAT	1500 mL/ha 500g/ha	1	0.00	0.00	0.00
			2	2.70	1.20	0.00
			3	2.80	0.20	0.00
			Mean	1.83	0.47	0.00
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 150 g/ha	1	0.00	0.00	0.00
			2	0.00	0.00	0.00
			3	0.70	0.00	0.00
			Mean	0.23	0.00	0.00
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 250 g/ha	1	0.00	0.00	0.00
			2	0.40	0.00	0.00
			3	0.68	0.00	0.00
			Mean	0.36	0.00	0.00
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 150 g/ha (shielded)	1	0.00	0.00	0.00
			2	1.20	0.00	0.00
			3	0.00	0.00	0.00
			Mean	0.40	0.00	0.00
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 250 g/ha (shielded)	1	0.00	0.00	0.00
			2	1.10	0.00	0.00
			3	0.00	0.00	0.00
			Mean	0.37	0.00	0.00
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 500 g/ha (shielded)	1	0.00	0.00	0.00
			2	0.00	0.00	0.00
			3	1.30	0.50	0.00
			Mean	0.43	0.17	0.00
11. Cultivation FRONTIER-P	Pre-plant 0 DAT	700 mL/ha	1	1.60	0.90	0.70
			2	2.30	1.10	1.20
			3	0.60	0.30	0.90
			Mean	1.50	0.77	0.93
12. Cultivation FRONTIER-P	Pre-plant 0 DAT	1000 mL/ha	1	0.90	0.00	0.00
			2	1.30	0.90	0.30
			3	1.40	0.30	0.00
			Mean	1.20	0.40	0.10
13. Cultivation FRONTIER-P BARON WP	Pre-plant 0 DAT 3 DAT	700 mL/ha 1000 g/ha	1	0.00	0.00	0.00
			2	0.80	0.00	0.00
			3	0.60	0.00	0.00
			Mean	0.47	0.00	0.00

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.48 Trial 7, Nairne, SA, Brussels Sprouts - Percentage Phytotoxicity

Treatment	Application Timing	Rate Prod/ha	Rep	28 DAT 19-Feb-10	59 DAT 24-Mar-10	63 DAT 01-Apr-10	77 DAT 15-Apr-10
			1	0.00	0.00	0.00	0.00
			2	0.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
1. Cultivation	Pre-plant		Mean	0.00	0.00	0.00	0.00
2. Cultivation	Pre-plant		1	0.00	0.00	0.00	0.00
Hand Weeding	Post-plant		2	0.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
3. Cultivation	Pre-plant		1	0.00	0.00	0.00	0.00
DUAL GOLD	0 DAT	1500 mL/ha	2	0.00	0.00	0.00	0.00
BARON WP	3 DAT	1000 g/ha	3	0.00	0.00	0.00	0.00
Inter-row cultivation			Mean	0.00	0.00	0.00	0.00
4. Cultivation	Pre-plant		1	0.00	0.00	0.00	0.00
DUAL GOLD	0 DAT	1500 mL/ha	2	0.00	0.00	0.00	0.00
BARON WP	3 DAT	1000 g/ha	3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
5. Cultivation	Pre-plant		1	0.00	0.00	0.00	0.00
DUAL GOLD	0 DAT	1500 mL/ha	2	0.00	0.00	0.00	0.00
BARON WP	3 WAT	500g/ha	3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
6. Cultivation	Pre-plant		1	0.00	0.00	0.00	0.00
DUAL GOLD	0 DAT	1500 mL/ha	2	0.00	0.00	0.00	0.00
BARON WP	3 DAT	1000 g/ha	3	0.00	0.00	0.00	0.00
BARON WP	3 WAT	150 g/ha	Mean	0.00	0.00	0.00	0.00
7. Cultivation	Pre-plant		1	0.00	0.00	0.00	0.00
DUAL GOLD	0 DAT	1500 mL/ha	2	0.00	0.00	0.00	0.00
BARON WP	3 DAT	1000 g/ha	3	0.00	0.00	0.00	0.00
BARON WP	3 WAT	250 g/ha	Mean	0.00	0.00	0.00	0.00
8. Cultivation	Pre-plant		1	0.00	0.00	0.00	0.00
DUAL GOLD	0 DAT	1500 mL/ha	2	0.00	0.00	0.00	0.00
BARON WP	3 DAT	1000 g/ha	3	0.00	0.00	0.00	0.00
BARON WP	3 WAT	150 g/ha (shielded)	Mean	0.00	0.00	0.00	0.00
9. Cultivation	Pre-plant		1	0.00	0.00	0.00	0.00
DUAL GOLD	0 DAT	1500 mL/ha	2	0.00	0.00	0.00	0.00
BARON WP	3 DAT	1000 g/ha	3	0.00	0.00	0.00	0.00
BARON WP	3 WAT	250 g/ha (shielded)	Mean	0.00	0.00	0.00	0.00
10. Cultivation	Pre-plant		1	0.00	0.00	0.00	0.00
DUAL GOLD	0 DAT	1500 mL/ha	2	0.00	0.00	0.00	0.00
BARON WP	3 DAT	1000 g/ha	3	0.00	0.00	0.00	0.00
BARON WP	3 WAT	500 g/ha (shielded)	Mean	0.00	0.00	0.00	0.00
11. Cultivation	Pre-plant		1	0.00	0.00	0.00	0.00
FRONTIER-P	0 DAT	700 mL/ha	2	0.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
12. Cultivation	Pre-plant		1	0.00	0.00	0.00	0.00
FRONTIER-P	0 DAT	1000 mL/ha	2	0.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
13. Cultivation	Pre-plant		1	0.00	0.00	0.00	0.00
FRONTIER-P	0 DAT	700 mL/ha	2	0.00	0.00	0.00	0.00
BARON WP	3 DAT	1000 g/ha	3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.49 Trial 7, Nairne, SA, Brussels Sprouts - Crop Vigour (0-100 Scale)

Treatment	Application Timing	Rate Prod/ha	Rep	72 DAT 04-May-10
1. Cultivation	Pre-plant		1	100.00
			2	100.00
			3	100.00
			Mean	100.00
2. Cultivation Hand Weeding	Pre-plant Post-plant		1	100.00
			2	100.00
			3	100.00
			Mean	100.00
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant 0 DAT 3 DAT	1500 mL/ha 1000 g/ha	1	100.00
			2	100.00
			3	100.00
			Mean	100.00
4. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 DAT	1500 mL/ha 1000 g/ha	1	100.00
			2	100.00
			3	100.00
			Mean	100.00
5. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 WAT	1500 mL/ha 500g/ha	1	100.00
			2	100.00
			3	100.00
			Mean	100.00
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 150 g/ha	1	100.00
			2	100.00
			3	100.00
			Mean	100.00
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 250 g/ha	1	100.00
			2	100.00
			3	100.00
			Mean	100.00
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 150 g/ha (shielded)	1	100.00
			2	100.00
			3	100.00
			Mean	100.00
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 250 g/ha (shielded)	1	100.00
			2	100.00
			3	100.00
			Mean	100.00
10. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 3 DAT 3 WAT	1500 mL/ha 1000 g/ha 500 g/ha (shielded)	1	100.00
			2	100.00
			3	100.00
			Mean	100.00
11. Cultivation FRONTIER-P	Pre-plant 0 DAT	700 mL/ha	1	100.00
			2	100.00
			3	100.00
			Mean	100.00
12. Cultivation FRONTIER-P	Pre-plant 0 DAT	1000 mL/ha	1	100.00
			2	100.00
			3	100.00
			Mean	100.00
13. Cultivation FRONTIER-P BARON WP	Pre-plant 0 DAT 3 DAT	700 mL/ha 1000 g/ha	1	100.00
			2	100.00
			3	100.00
			Mean	100.00

DAT - days after transplanting; WAT - weeks after transplanting

**11.1.50 Trial 8, Manjimup, WA, Cauliflower - Fat Hen (*Chenopodium album*)  
Percentage Weed Control**

Treatment	Application Timing	Rate Prod/ha	Rep	14 DAT 24-Mar-10	22 DAT 01-Apr-10	46 DAT 15-Apr-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0
			2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	0.0	100.0	100.0
	Post-plant		2	0.0	80.0	100.0
			3	0.0	100.0	100.0
			Mean	0.0	93.3	100.0
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant		1	100.0	100.0	95.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
			Mean	100.0	100.0	98.3
4. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
5. Cultivation DUAL GOLD BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0
	3 WAT	500 g/ha	3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
	3 WAT	150 g/ha	Mean	100.0	100.0	100.0
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
	3 WAT	250 g/ha	Mean	100.0	100.0	100.0
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
	3 WAT	150 g/ha (shielded)	Mean	100.0	100.0	100.0
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant		1	100.0	100.0	100.0
	0 DAT	2000 mL/ha	2	100.0	100.0	100.0
	2 DAT	1000 g/ha	3	100.0	100.0	100.0
	3 WAT	250 g/ha (shielded)	Mean	100.0	100.0	100.0

DAT - days after transplanting; WAT - weeks after transplanting

**11.1.51 Trial 8, Manjimup, WA, Cauliflower - Ryegrass (*Lolium rigidum*)  
Percentage Weed Control**

Treatment	Application Timing	Rate Prod/ha	Rep	14 DAT 24-Mar-10	22 DAT 01-Apr-10	46 DAT 15-Apr-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0
			2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	0.0	90.0	50.0
			2	0.0	90.0	80.0
	Post-plant		3	0.0	90.0	70.0
			Mean	0.0	90.0	66.7
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant 0 DAT 2 DAT	2000 mL/ha	1	90.0	90.0	70.0
			2	90.0	95.0	95.0
		1000 g/ha	3	90.0	85.0	80.0
			Mean	90.0	90.0	81.7
4. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 2 DAT	2000 mL/ha	1	90.0	90.0	80.0
			2	80.0	90.0	70.0
		1000 g/ha	3	90.0	90.0	70.0
			Mean	86.7	90.0	73.3
5. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 WAT	2000 mL/ha	1	9.0	95.0	95.0
			2	85.0	95.0	90.0
		500 g/ha	3	80.0	85.0	85.0
			Mean	58.0	91.7	90.0
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2000 mL/ha	1	85.0	80.0	70.0
			2	90.0	90.0	85.0
		1000 g/ha	3	90.0	90.0	95.0
			Mean	88.3	86.7	83.3
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2000 mL/ha	1	90.0	95.0	80.0
			2	90.0	95.0	95.0
		1000 g/ha	3	90.0	95.0	95.0
			Mean	90.0	95.0	90.0
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2000 mL/ha	1	80.0	85.0	70.0
			2	90.0	90.0	90.0
		1000 g/ha	3	90.0	95.0	95.0
			Mean	86.7	90.0	85.0
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2000 mL/ha	1	85.0	85.0	80.0
			2	90.0	95.0	75.0
		1000 g/ha	3	90.0	90.0	9.0
			Mean	88.3	90.0	54.7

DAT - days after transplanting; WAT - weeks after transplanting

**11.1.52 Trial 8, Manjimup, WA, Cauliflower - Arrow Leaf Clover (*Trifolium vesiculosum*) Percentage Weed Control**

Treatment	Application Timing	Rate Prod/ha	Rep	14 DAT 24-Mar-10	22 DAT 01-Apr-10	46 DAT 15-Apr-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0
			2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	0.0	85.0	50.0
	Post-plant		2	0.0	95.0	80.0
			3	0.0	85.0	80.0
	Mean		0.0	88.3	70.0	
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant	2000 mL/ha 1000 g/ha	1	95.0	95.0	70.0
	0 DAT		2	85.0	95.0	85.0
	2 DAT		3	85.0	85.0	90.0
	Mean		88.3	91.7	81.7	
4. Cultivation DUAL GOLD BARON WP	Pre-plant	2000 mL/ha 1000 g/ha	1	100.0	100.0	100.0
	0 DAT		2	80.0	80.0	60.0
	2 DAT		3	90.0	90.0	90.0
	Mean		90.0	90.0	83.3	
5. Cultivation DUAL GOLD BARON WP	Pre-plant	2000 mL/ha 500 g/ha	1	100.0	100.0	100.0
	0 DAT		2	85.0	85.0	85.0
	3 WAT		3	80.0	80.0	60.0
	Mean		88.3	88.3	81.7	
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 150 g/ha	1	90.0	85.0	80.0
	0 DAT		2	90.0	90.0	80.0
	2 DAT		3	90.0	95.0	95.0
	Mean		90.0	90.0	85.0	
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 250 g/ha	1	90.0	95.0	75.0
	0 DAT		2	90.0	95.0	95.0
	2 DAT		3	95.0	95.0	95.0
	Mean		91.7	95.0	88.3	
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 150 g/ha (shielded)	1	90.0	90.0	90.0
	0 DAT		2	85.0	85.0	80.0
	2 DAT		3	80.0	90.0	90.0
	Mean		85.0	88.3	86.7	
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 250 g/ha (shielded)	1	95.0	100.0	100.0
	0 DAT		2	85.0	85.0	70.0
	2 DAT		3	90.0	95.0	90.0
	Mean		90.0	93.3	86.7	

DAT - days after transplanting; WAT - weeks after transplanting

**11.1.53 Trial 8, Manjimup, WA, Cauliflower - Cape Weed (*Arctotheca calendula*)  
Percentage Weed Control**

Treatment	Application Timing	Rate Prod/ha	Rep	14 DAT 24-Mar-10	22 DAT 01-Apr-10	46 DAT 15-Apr-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0
			2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	0.0	90.0	60.0
			2	0.0	80.0	100.0
	Post-plant		3	0.0	90.0	100.0
			Mean	0.0	86.7	86.7
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant 0 DAT 2 DAT	2000 mL/ha	1	100.0	100.0	95.0
			2	100.0	100.0	100.0
		1000 g/ha	3	100.0	100.0	100.0
		Mean	100.0	100.0	98.3	
4. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 2 DAT	2000 mL/ha	1	100.0	100.0	100.0
			2	90.0	90.0	80.0
		1000 g/ha	3	95.0	90.0	100.0
		Mean	95.0	93.3	93.3	
5. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 WAT	2000 mL/ha	1	100.0	100.0	100.0
			2	100.0	100.0	95.0
		500 g/ha	3	100.0	100.0	100.0
		Mean	100.0	100.0	98.3	
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2000 mL/ha	1	90.0	100.0	95.0
			2	95.0	100.0	100.0
		1000 g/ha	3	100.0	100.0	100.0
		150 g/ha	Mean	95.0	100.0	98.3
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2000 mL/ha	1	95.0	100.0	100.0
			2	100.0	100.0	100.0
		1000 g/ha	3	100.0	100.0	100.0
		250 g/ha	Mean	98.3	100.0	100.0
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2000 mL/ha	1	95.0	100.0	100.0
			2	100.0	100.0	95.0
		1000 g/ha	3	100.0	100.0	100.0
		150 g/ha (shielded)	Mean	98.3	100.0	98.3
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2000 mL/ha	1	95.0	100.0	95.0
			2	100.0	100.0	90.0
		1000 g/ha	3	100.0	100.0	100.0
		250 g/ha (shielded)	Mean	98.3	100.0	95.0

DAT - days after transplanting; WAT - weeks after transplanting



### 11.1.54 Trial 8, Manjimup, WA, Cauliflower - Docks (*Rumex* sp.) Percentage Weed Control

Treatment	Application Timing	Rate Prod/ha	Rep	14 DAT 24-Mar-10	22 DAT 01-Apr-10	46 DAT 15-Apr-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0
			2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant Post-plant		1	0.0	100.0	100.0
			2	0.0	100.0	100.0
			3	0.0	100.0	100.0
			Mean	0.0	100.0	100.0
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant 0 DAT 2 DAT	2000 mL/ha 1000 g/ha	1	95.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	98.3	100.0	100.0
4. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 2 DAT	2000 mL/ha 1000 g/ha	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
5. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 WAT	2000 mL/ha 500 g/ha	1	95.0	100.0	95.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	98.3	100.0	98.3
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2000 mL/ha 1000 g/ha 150 g/ha	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	95.0	100.0	100.0
			Mean	98.3	100.0	100.0
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2000 mL/ha 1000 g/ha 250 g/ha	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2000 mL/ha 1000 g/ha 150 g/ha (shielded)	1	100.0	100.0	100.0
			2	95.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	98.3	100.0	100.0
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2000 mL/ha 1000 g/ha 250 g/ha (shielded)	1	100.0	100.0	100.0
			2	95.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	98.3	100.0	100.0

DAT - days after transplanting; WAT - weeks after transplanting

**11.1.55 Trial 8, Manjimup, WA, Cauliflower - Wild Radish (*Raphanus raphanistrum*) Percentage Weed Control**

Treatment	Application Timing	Rate Prod/ha	Rep	14 DAT 24-Mar-10	22 DAT 01-Apr-10	46 DAT 15-Apr-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0
			2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	0.0	90.0	30.0
			2	0.0	100.0	80.0
	Post-plant		3	0.0	100.0	95.0
			Mean	0.0	96.7	68.3
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant	2000 mL/ha 1000 g/ha	1	95.0	90.0	100.0
			2	100.0	100.0	100.0
	0 DAT 2 DAT		3	100.0	100.0	100.0
			Mean	98.3	96.7	100.0
4. Cultivation DUAL GOLD BARON WP	Pre-plant	2000 mL/ha 1000 g/ha	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
	0 DAT 2 DAT		3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
5. Cultivation DUAL GOLD BARON WP	Pre-plant	2000 mL/ha 500 g/ha	1	100.0	100.0	100.0
			2	95.0	100.0	95.0
	0 DAT 3 WAT		3	100.0	100.0	100.0
			Mean	98.3	100.0	98.3
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 150 g/ha	1	90.0	95.0	95.0
			2	100.0	100.0	95.0
	0 DAT 2 DAT 3 WAT		3	100.0	100.0	100.0
			Mean	96.7	98.3	96.7
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 250 g/ha	1	95.0	100.0	95.0
			2	95.0	100.0	100.0
	0 DAT 2 DAT 3 WAT		3	100.0	100.0	100.0
			Mean	96.7	100.0	98.3
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 150 g/ha (shielded)	1	100.0	100.0	95.0
			2	100.0	95.0	100.0
	0 DAT 2 DAT 3 WAT		3	100.0	100.0	100.0
			Mean	100.0	98.3	98.3
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 250 g/ha (shielded)	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
	0 DAT 2 DAT 3 WAT		3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.56 Trial 8, Manjimup, WA, Cauliflower - Crop Vigour Loss

Treatment	Application Timing	Rate Prod/ha	Rep	14 DAT 24-Mar-10	22 DAT 01-Apr-10	46 DAT 15-Apr-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0
			2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	0.0	0.0	0.0
			2	0.0	0.0	0.0
	Post-plant		3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant	2000 mL/ha 1000 g/ha	1	0.0	0.0	0.0
			0 DAT	2	0.0	0.0
	2 DAT		3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
4. Cultivation DUAL GOLD BARON WP	Pre-plant	2000 mL/ha 1000 g/ha	1	0.0	0.0	0.0
			0 DAT	2	0.0	0.0
	2 DAT		3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
5. Cultivation DUAL GOLD BARON WP	Pre-plant	2000 mL/ha 500 g/ha	1	0.0	0.0	0.0
			0 DAT	2	0.0	0.0
	3 WAT		3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 150 g/ha	1	0.0	0.0	0.0
			0 DAT	2	0.0	0.0
	2 DAT		3	0.0	0.0	0.0
			3 WAT	Mean	0.0	0.0
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 250 g/ha	1	0.0	0.0	0.0
			0 DAT	2	0.0	0.0
	2 DAT		3	0.0	0.0	0.0
			3 WAT	Mean	0.0	0.0
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 150 g/ha (shielded)	1	0.0	0.0	0.0
			0 DAT	2	0.0	0.0
	2 DAT		3	0.0	0.0	0.0
			3 WAT	Mean	0.0	0.0
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant	2000 mL/ha 1000 g/ha 250 g/ha (shielded)	1	0.0	0.0	0.0
			0 DAT	2	0.0	0.0
	2 DAT		3	0.0	0.0	0.0
			3 WAT	Mean	0.0	0.0

DAT - days after transplanting; WAT - weeks after transplanting

### 11.1.57 Trial 8, Manjimup, WA, Cauliflower - Percentage Phytotoxicity

Treatment	Application Timing	Rate Prod/ha	Rep	14 DAT 24-Mar-10	22 DAT 01-Apr-10	46 DAT 15-Apr-10
1. Cultivation	Pre-plant		1	0.0	0.0	0.0
			2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
2. Cultivation Hand Weeding	Pre-plant		1	0.0	0.0	0.0
			2	0.0	0.0	0.0
	Post-plant		3	0.0	0.0	3.0
			Mean	0.0	0.0	1.0
3. Cultivation DUAL GOLD BARON WP Inter-row cultivation	Pre-plant 0 DAT 2 DAT	2000 mL/ha 1000 g/ha	1	0.0	0.0	2.0
			2	0.0	0.0	6.0
			3	0.0	0.0	2.0
			Mean	0.0	0.0	3.3
4. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 2 DAT	2000 mL/ha 1000 g/ha	1	0.0	0.0	3.0
			2	0.0	0.0	4.0
			3	0.0	0.0	1.0
			Mean	0.0	0.0	2.7
5. Cultivation DUAL GOLD BARON WP	Pre-plant 0 DAT 3 WAT	2000 mL/ha 500 g/ha	1	0.0	0.0	1.0
			2	0.0	0.0	1.0
			3	0.0	0.0	3.0
			Mean	0.0	0.0	1.7
6. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2000 mL/ha 1000 g/ha 150 g/ha	1	0.0	0.0	1.0
			2	0.0	0.0	2.0
			3	0.0	0.0	7.0
			Mean	0.0	0.0	3.3
7. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2000 mL/ha 1000 g/ha 250 g/ha	1	0.0	0.0	2.0
			2	0.0	0.0	3.0
			3	0.0	0.0	6.0
			Mean	0.0	0.0	3.7
8. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2000 mL/ha 1000 g/ha 150 g/ha (shielded)	1	0.0	0.0	1.0
			2	0.0	0.0	2.0
			3	0.0	0.0	5.0
			Mean	0.0	0.0	2.7
9. Cultivation DUAL GOLD BARON WP BARON WP	Pre-plant 0 DAT 2 DAT 3 WAT	2000 mL/ha 1000 g/ha 250 g/ha (shielded)	1	0.0	0.0	2.0
			2	0.0	0.0	1.0
			3	0.0	0.0	6.0
			Mean	0.0	0.0	3.0

DAT - days after transplanting; WAT - weeks after transplanting

## 11.2 Project Component 2 – Knockdown Shielded Herbicide Program

### 11.2.1 Trial 1, Gatton, Qld, Broccoli - Black Pigweed (*Trianthema portulacastrum*) Percentage Weed Control

Treatment	Rate of Product/ha	Application Timing	Rep.	29 DAT 11-Mar-10	37 DAT 19-Mar-10	50 DAT 01-Apr-10
1. Control	2000 mL	Pre-plant	1	0.0	0.0	0.0
			2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
2. DUAL GOLD	2000 mL	0 DAT	1	80.0	50.0	90.0
			2	80.0	50.0	50.0
			3	80.0	70.0	80.0
			Mean	80.0	56.7	73.3
3. BARON WP*	250 g	3 WAT	1	90.0	95.0	100.0
			2	90.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	93.3	98.3	100.0
4. BARON WP*	500 g	3 WAT	1	100.0	100.0	100.0
			2	90.0	100.0	100.0
			3	95.0	100.0	100.0
			Mean	95.0	100.0	100.0
5. SPOTLIGHT PLUS*	300 mL	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	95.0
			3	90.0	80.0	90.0
			Mean	96.7	93.3	95.0
6. BASTA*	2.5 L	3 WAT	1	100.0	100.0	100.0
			2	95.0	100.0	100.0
			3	90.0	100.0	100.0
			Mean	95.0	100.0	100.0
7. GRAMOXONE 250*	800 mL	3 WAT	1	60.0	40.0	40.0
			2	60.0	50.0	60.0
			3	90.0	75.0	95.0
			Mean	70.0	55.0	65.0
8. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	95.0	100.0	90.0
			Mean	98.3	100.0	96.7
9. BASTA + BARON WP*	2.5 L + 500 g	3 WAT	1	100.0	100.0	100.0
			2	90.0	100.0	100.0
			3	95.0	98.0	95.0
			Mean	95.0	99.3	98.3
10. BASTA + SPOTLIGHT PLUS*	2.5 L + 300 mL	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	95.0	100.0	100.0
			Mean	98.3	100.0	100.0
11. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	95.0	100.0	100.0
			2	95.0	100.0	100.0
			3	90.0	95.0	95.0
			Mean	93.3	98.3	98.3
12. GRAMOXONE 250 + BARON WP*	800 mL + 500 g	3 WAT	1	95.0	100.0	100.0
			2	95.0	90.0	90.0
			3	100.0	100.0	100.0
			Mean	96.7	96.7	96.7
13. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 300 mL	3 WAT	1	80.0	100.0	100.0
			2	100.0	100.0	100.0
			3	95.0	100.0	90.0
			Mean	91.7	100.0	96.7

DAT - days after transplanting; WAT - weeks after transplanting

\*DUAL GOLD applied at 0 DAT at 2000 mL/ha

## 11.2.2 Trial 1, Gatton, Qld, Broccoli - Sowthistle (*Sonchus oleraceus*) Percentage Weed Control

Treatment	Rate of Product/ha	Application Timing	Rep.	29 DAT 11-Mar-10	37 DAT 19-Mar-10	50 DAT 01-Apr-10
1. Control	2000 mL	Pre-plant	1	0.0	0.0	0.0
			2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
2. DUAL GOLD	2000 mL	0 DAT	1	70.0	80.0	90.0
			2	80.0	100.0	100.0
			3	70.0	98.0	100.0
			Mean	73.3	92.7	96.7
3. BARON WP*	250 g	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
4. BARON WP*	500 g	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
5. SPOTLIGHT PLUS*	300 mL	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
6. BASTA*	2.5 L	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
7. GRAMOXONE 250*	800 mL	3 WAT	1	80.0	90.0	80.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	93.3	96.7	93.3
8. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
9. BASTA + BARON WP*	2.5 L + 500 g	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
10. BASTA + SPOTLIGHT PLUS*	2.5 L + 300 mL	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
11. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
12. GRAMOXONE 250 + BARON WP*	800 mL + 500 g	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
13. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 300 mL	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	90.0
			Mean	100.0	100.0	96.7

DAT - days after transplanting; WAT - weeks after transplanting

\*DUAL GOLD applied at 0 DAT at 2000 mL/ha

### 11.2.3 Trial 1, Gatton, Qld, Broccoli - Dwarf Amaranth (*Amaranthus macrocarpus*) Percentage Weed Control

Treatment	Rate of Product/ha	Application Timing	Rep.	29 DAT 11-Mar-10	37 DAT 19-Mar-10	50 DAT 01-Apr-10
1. Control	2000 mL	Pre-plant	1	0.0	0.0	0.0
			2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
2. DUAL GOLD	2000 mL	0 DAT	1	80.0	60.0	60.0
			2	80.0	50.0	60.0
			3	80.0	90.0	60.0
			Mean	80.0	66.7	60.0
3. BARON WP*	250 g	3 WAT	1	100.0	90.0	100.0
			2	85.0	60.0	100.0
			3	95.0	100.0	100.0
			Mean	93.3	83.3	100.0
4. BARON WP*	500 g	3 WAT	1	100.0	100.0	100.0
			2	90.0	90.0	90.0
			3	95.0	95.0	100.0
			Mean	95.0	95.0	96.7
5. SPOTLIGHT PLUS*	300 mL	3 WAT	1	100.0	100.0	100.0
			2	90.0	100.0	100.0
			3	90.0	100.0	100.0
			Mean	93.3	100.0	100.0
6. BASTA*	2.5 L	3 WAT	1	100.0	100.0	100.0
			2	90.0	100.0	100.0
			3	95.0	100.0	100.0
			Mean	95.0	100.0	100.0
7. GRAMOXONE 250*	800 mL	3 WAT	1	100.0	60.0	80.0
			2	100.0	70.0	100.0
			3	90.0	90.0	95.0
			Mean	96.7	73.3	91.7
8. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	100.0	100.0	100.0
			2	95.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	98.3	100.0	100.0
9. BASTA + BARON WP*	2.5 L + 500 g	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
10. BASTA + SPOTLIGHT PLUS*	2.5 L + 300 mL	3 WAT	1	100.0	100.0	100.0
			2	95.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	98.3	100.0	100.0
11. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	95.0	100.0	85.0
			2	95.0	85.0	100.0
			3	100.0	100.0	100.0
			Mean	96.7	95.0	95.0
12. GRAMOXONE 250 + BARON WP*	800 mL + 500 g	3 WAT	1	95.0	98.0	100.0
			2	95.0	60.0	100.0
			3	95.0	100.0	100.0
			Mean	95.0	86.0	100.0
13. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 300 mL	3 WAT	1	100.0	100.0	100.0
			2	95.0	100.0	100.0
			3	95.0	100.0	100.0
			Mean	96.7	100.0	100.0

DAT - days after transplanting; WAT - weeks after transplanting

\*DUAL GOLD applied at 0 DAT at 2000 mL/ha

### 11.2.4 Trial 1, Gatton, Qld, Broccoli - Awnless Barnyard Grass (*Echinochloa crus-galli*) Percentage Weed Control

Treatment	Rate of Product/ha	Application Timing	Rep.	29 DAT 11-Mar-10	37 DAT 19-Mar-10	50 DAT 01-Apr-10
1. Control	2000 mL	Pre-plant	1	0.0	0.0	0.0
			2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
2. DUAL GOLD	2000 mL	0 DAT	1	100.0	90.0	100.0
			2	100.0	90.0	100.0
			3	70.0	90.0	80.0
			Mean	90.0	90.0	93.3
3. BARON WP*	250 g	3 WAT	1	100.0	80.0	100.0
			2	100.0	90.0	100.0
			3	100.0	90.0	100.0
			Mean	100.0	86.7	100.0
4. BARON WP*	500 g	3 WAT	1	100.0	80.0	100.0
			2	95.0	90.0	100.0
			3	100.0	80.0	100.0
			Mean	98.3	83.3	100.0
5. SPOTLIGHT PLUS*	300 mL	3 WAT	1	100.0	80.0	100.0
			2	100.0	90.0	100.0
			3	100.0	80.0	100.0
			Mean	100.0	83.3	100.0
6. BASTA*	2.5 L	3 WAT	1	100.0	80.0	100.0
			2	100.0	90.0	100.0
			3	100.0	90.0	100.0
			Mean	100.0	86.7	100.0
7. GRAMOXONE 250*	800 mL	3 WAT	1	100.0	80.0	100.0
			2	100.0	80.0	80.0
			3	90.0	90.0	95.0
			Mean	96.7	83.3	91.7
8. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	100.0	80.0	100.0
			2	100.0	80.0	100.0
			3	100.0	80.0	100.0
			Mean	100.0	80.0	100.0
9. BASTA + BARON WP*	2.5 L + 500 g	3 WAT	1	100.0	80.0	100.0
			2	100.0	80.0	100.0
			3	100.0	90.0	100.0
			Mean	100.0	83.3	100.0
10. BASTA + SPOTLIGHT PLUS*	2.5 L + 300 mL	3 WAT	1	100.0	80.0	100.0
			2	100.0	90.0	100.0
			3	100.0	80.0	100.0
			Mean	100.0	83.3	100.0
11. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	100.0	90.0	100.0
			2	100.0	90.0	100.0
			3	100.0	80.0	100.0
			Mean	100.0	86.7	100.0
12. GRAMOXONE 250 + BARON WP*	800 mL + 500 g	3 WAT	1	100.0	90.0	100.0
			2	100.0	90.0	100.0
			3	100.0	90.0	100.0
			Mean	100.0	90.0	100.0
13. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 300 mL	3 WAT	1	100.0	80.0	100.0
			2	100.0	80.0	100.0
			3	100.0	70.0	95.0
			Mean	100.0	76.7	98.3

DAT - days after transplanting; WAT - weeks after transplanting

\*DUAL GOLD applied at 0 DAT at 2000 mL/ha



## 11.2.5 Trial 1, Gatton, Qld, Broccoli - Crop Vigour

Treatment	Rate of Product/ha	Application Timing	Rep.	29 DAT 11-Mar-10	37 DAT 19-Mar-10	50 DAT 01-Apr-10
1. Control	2000 mL	Pre-plant	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
2. DUAL GOLD	2000 mL	0 DAT	1	80.0	90.0	80.0
			2	85.0	50.0	90.0
			3	75.0	80.0	80.0
			Mean	80.0	73.3	83.3
3. BARON WP*	250 g	3 WAT	1	80.0	100.0	90.0
			2	90.0	70.0	90.0
			3	80.0	100.0	90.0
			Mean	83.3	90.0	90.0
4. BARON WP*	500 g	3 WAT	1	75.0	100.0	80.0
			2	80.0	90.0	95.0
			3	75.0	100.0	80.0
			Mean	76.7	96.7	85.0
5. SPOTLIGHT PLUS*	300 mL	3 WAT	1	65.0	100.0	70.0
			2	90.0	100.0	90.0
			3	65.0	100.0	80.0
			Mean	73.3	100.0	80.0
6. BASTA*	2.5 L	3 WAT	1	70.0	100.0	70.0
			2	85.0	70.0	90.0
			3	70.0	100.0	80.0
			Mean	75.0	90.0	80.0
7. GRAMOXONE 250*	800 mL	3 WAT	1	70.0	70.0	70.0
			2	75.0	100.0	80.0
			3	75.0	95.0	80.0
			Mean	73.3	88.3	76.7
8. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	85.0	100.0	80.0
			2	80.0	100.0	90.0
			3	75.0	100.0	80.0
			Mean	80.0	100.0	83.3
9. BASTA + BARON WP*	2.5 L + 500 g	3 WAT	1	85.0	100.0	80.0
			2	90.0	100.0	80.0
			3	80.0	100.0	90.0
			Mean	85.0	100.0	83.3
10. BASTA + SPOTLIGHT PLUS*	2.5 L + 300 mL	3 WAT	1	85.0	100.0	80.0
			2	80.0	100.0	90.0
			3	75.0	100.0	70.0
			Mean	80.0	100.0	80.0
11. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	90.0	100.0	80.0
			2	75.0	80.0	80.0
			3	70.0	100.0	80.0
			Mean	78.3	93.3	80.0
12. GRAMOXONE 250 + BARON WP*	800 mL + 500 g	3 WAT	1	75.0	100.0	80.0
			2	85.0	75.0	90.0
			3	70.0	100.0	80.0
			Mean	76.7	91.7	83.3
13. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 300 mL	3 WAT	1	75.0	100.0	70.0
			2	85.0	100.0	90.0
			3	65.0	100.0	70.0
			Mean	75.0	100.0	76.7

DAT - days after transplanting; WAT - weeks after transplanting

\*DUAL GOLD applied at 0 DAT at 2000 mL/ha

## 11.2.6 Trial 2, Mangrove Mountain, NSW, Broccoli - Weed by Species at 50 DAT per 1m<sup>2</sup>

Treatment	Rate of Product/ha	Application Timing	Rep.	Potato weed 16-Jun-10	Chickweed 16-Jun-10	shepherd's purse 16-Jun-10	winter grass 16-Jun-10
1. Control		Pre-plant	1	2.0	23.0	1.0	2.0
			2	2.0	9.0	0.0	15.0
			3	0.0	15.0	0.0	2.0
			Mean	1.3	15.7	0.3	6.3
2. BARON WP*	250 g	0 DAT	1	1.0	3.0	0.0	0.0
			2	0.0	5.0	0.0	16.0
			3	0.0	9.0	0.0	2.0
			Mean	0.3	5.7	0.0	6.0
3. BARON WP*	500 g	3 WAT	1	0.0	5.0	0.0	1.0
			2	0.0	2.0	0.0	0.0
			3	0.0	3.0	0.0	0.0
			Mean	0.0	3.3	0.0	0.3
4. SPOTLIGHT PLUS*	300 mL	3 WAT	1	0.0	5.0	0.0	0.0
			2	0.0	4.0	0.0	3.0
			3	0.0	2.0	0.0	0.0
			Mean	0.0	3.7	0.0	1.0
5. BASTA*	2.5 L	3 WAT	1	0.0	1.0	0.0	1.0
			2	0.0	4.0	0.0	4.0
			3	0.0	4.0	0.0	1.0
			Mean	0.0	3.0	0.0	2.0
6. GRAMOXONE 250*	800 mL	3 WAT	1	0.0	8.0	0.0	0.0
			2	0.0	8.0	0.0	0.0
			3	0.0	3.0	0.0	0.0
			Mean	0.0	6.3	0.0	0.0
7. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	0.0	1.0	0.0	0.0
			2	0.0	0.0	0.0	0.0
			3	0.0	4.0	0.0	0.0
			Mean	0.0	1.7	0.0	0.0
8. BASTA + BARON WP*	2.5 L + 500 g	3 WAT	1	0.0	1.0	0.0	1.0
			2	0.0	3.0	0.0	0.0
			3	0.0	0.0	0.0	0.0
			Mean	0.0	1.3	0.0	0.3
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 300 mL	3 WAT	1	0.0	3.0	0.0	1.0
			2	0.0	1.0	0.0	3.0
			3	0.0	0.0	0.0	0.0
			Mean	0.0	1.3	0.0	1.3
10. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	0.0	0.0	0.0	0.0
			2	0.0	1.0	0.0	0.0
			3	0.0	2.0	0.0	0.0
			Mean	0.0	1.0	0.0	0.0
11. GRAMOXONE 250 + BARON WP*	800 mL + 500 g	3 WAT	1	0.0	0.0	0.0	0.0
			2	0.0	3.0	0.0	0.0
			3	0.0	2.0	0.0	0.0
			Mean	0.0	1.7	0.0	0.0
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 300 mL	3 WAT	1	0.0	3.0	0.0	0.0
			2	0.0	5.0	0.0	1.0
			3	0.0	4.0	0.0	0.0
			Mean	0.0	4.0	0.0	0.3

DAT - days after transplanting; WAT - weeks after transplanting

\*DUAL GOLD applied at 0 DAT at 2000 mL/ha

## 11.2.7 Trial 2, Mangrove Mountain, NSW, Broccoli - Potato Weed (*Galinsoga parviflora*) Percentage Weed Control

Treatment	Rate of Product/ha	Application Timing	Rep.	35 DAT 01-Jun-10	50 DAT 16-Jun-10	73 DAT 09-Jul-10
1. Control		Pre-plant	1	0.0	0.0	0.0
			2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
2. BARON WP*	250 g	0 DAT	1	90.0	80.0	100.0
			2	50.0	100.0	90.0
			3	100.0	100.0	100.0
			Mean	80.0	93.3	96.7
3. BARON WP*	500 g	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
4. SPOTLIGHT PLUS*	300 mL	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
5. BASTA*	2.5 L	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
6. GRAMOXONE 250*	800 mL	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
7. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
8. BASTA + BARON WP*	2.5 L + 500 g	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 300 mL	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
10. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	100.0	100.0	100.0
			2	90.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	96.7	100.0	100.0
11. GRAMOXONE 250 + BARON WP*	800 mL + 500 g	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 300 mL	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0

DAT - days after transplanting; WAT - weeks after transplanting

\*DUAL GOLD applied at 0 DAT at 2000 mL/ha

## 11.2.8 Trial 2, Mangrove Mountain, NSW, Broccoli - Chickweed (*Stellaria media*) Percentage Weed Control

Treatment	Rate of Product/ha	Application Timing	Rep.	35 DAT 01-Jun-10	50 DAT 16-Jun-10	73 DAT 09-Jul-10
1. Control		Pre-plant	1	0.0	0.0	0.0
			2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
2. BARON WP*	250 g	0 DAT	1	85.0	90.0	80.0
			2	20.0	50.0	80.0
			3	70.0	70.0	90.0
			Mean	58.3	70.0	83.3
3. BARON WP*	500 g	3 WAT	1	95.0	90.0	95.0
			2	95.0	95.0	80.0
			3	80.0	90.0	97.0
			Mean	90.0	91.7	90.7
4. SPOTLIGHT PLUS*	300 mL	3 WAT	1	95.0	90.0	75.0
			2	95.0	60.0	80.0
			3	99.0	95.0	80.0
			Mean	96.3	81.7	78.3
5. BASTA*	2.5 L	3 WAT	1	95.0	99.0	98.0
			2	90.0	90.0	85.0
			3	90.0	90.0	93.0
			Mean	91.7	93.0	92.0
6. GRAMOXONE 250*	800 mL	3 WAT	1	95.0	60.0	80.0
			2	90.0	20.0	90.0
			3	90.0	90.0	85.0
			Mean	91.7	56.7	85.0
7. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	98.0	99.0	95.0
			2	99.0	100.0	95.0
			3	80.0	95.0	95.0
			Mean	92.3	98.0	95.0
8. BASTA + BARON WP*	2.5 L + 500 g	3 WAT	1	98.0	99.0	97.0
			2	99.0	99.0	93.0
			3	95.0	100.0	98.0
			Mean	97.3	99.3	96.0
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 300 mL	3 WAT	1	99.0	95.0	90.0
			2	90.0	99.0	90.0
			3	95.0	99.0	90.0
			Mean	94.7	97.7	90.0
10. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	99.0	99.0	97.0
			2	80.0	99.0	93.0
			3	95.0	98.0	99.0
			Mean	91.3	98.7	96.3
11. GRAMOXONE 250 + BARON WP*	800 mL + 500 g	3 WAT	1	99.0	100.0	98.0
			2	97.0	99.0	90.0
			3	90.0	95.0	98.0
			Mean	95.3	98.0	95.3
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 300 mL	3 WAT	1	99.0	98.0	96.0
			2	98.0	80.0	85.0
			3	90.0	98.0	93.0
			Mean	95.7	92.0	91.3

DAT - days after transplanting; WAT - weeks after transplanting

\*DUAL GOLD applied at 0 DAT at 2000 mL/ha

**11.2.9 Trial 2, Mangrove Mountain, NSW, Broccoli - Shepherd's Purse (*Capsella bursa-pastoris*) Percentage Weed Control**

Treatment	Rate of Product/ha	Application Timing	Rep.	35 DAT 01-Jun-10	50 DAT 16-Jun-10	73 DAT 09-Jul-10
1. Control		Pre-plant	1	0.0	0.0	0.0
			2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
2. BARON WP*	250 g	0 DAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
3. BARON WP*	500 g	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
4. SPOTLIGHT PLUS*	300 mL	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
5. BASTA*	2.5 L	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	85.0
			3	100.0	100.0	90.0
			Mean	100.0	100.0	91.7
6. GRAMOXONE 250*	800 mL	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
7. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
8. BASTA + BARON WP*	2.5 L + 500 g	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 300 mL	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
10. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
11. GRAMOXONE 250 + BARON WP*	800 mL + 500 g	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 300 mL	3 WAT	1	100.0	100.0	100.0
			2	100.0	100.0	100.0
			3	100.0	100.0	100.0
			Mean	100.0	100.0	100.0

DAT - days after transplanting; WAT - weeks after transplanting

\*DUAL GOLD applied at 0 DAT at 2000 mL/ha

**11.2.10 Trial 2, Mangrove Mountain, NSW, Broccoli - Winter Grass (*Poa annua*)  
Percentage Weed Control**

Treatment	Rate of Product/ha	Application Timing	Rep.	35 DAT 01-Jun-10	50 DAT 16-Jun-10	73 DAT 09-Jul-10
1. Control		Pre-plant	1	0.0	0.0	0.0
			2	0.0	0.0	0.0
			3	0.0	0.0	0.0
			Mean	0.0	0.0	0.0
2. BARON WP*	250 g	0 DAT	1	85.0	90.0	95.0
			2	0.0	10.0	10.0
			3	20.0	90.0	98.0
			Mean	35.0	63.3	67.7
3. BARON WP*	500 g	3 WAT	1	80.0	80.0	98.0
			2	100.0	100.0	98.0
			3	95.0	100.0	100.0
			Mean	91.7	93.3	98.7
4. SPOTLIGHT PLUS*	300 mL	3 WAT	1	95.0	100.0	10.0
			2	95.0	70.0	50.0
			3	100.0	100.0	100.0
			Mean	96.7	90.0	53.3
5. BASTA*	2.5 L	3 WAT	1	90.0	99.0	99.0
			2	90.0	90.0	90.0
			3	80.0	99.0	90.0
			Mean	86.7	96.0	93.0
6. GRAMOXONE 250*	800 mL	3 WAT	1	95.0	100.0	70.0
			2	95.0	100.0	99.0
			3	100.0	100.0	100.0
			Mean	96.7	100.0	89.7
7. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	99.0	100.0	95.0
			2	99.0	100.0	100.0
			3	95.0	99.0	100.0
			Mean	97.7	99.7	98.3
8. BASTA + BARON WP*	2.5 L + 500 g	3 WAT	1	98.0	99.0	98.0
			2	100.0	100.0	100.0
			3	95.0	100.0	100.0
			Mean	97.7	99.7	99.3
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 300 mL	3 WAT	1	99.0	99.0	98.0
			2	80.0	90.0	85.0
			3	100.0	99.0	100.0
			Mean	93.0	96.0	94.3
10. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	100.0	100.0	99.0
			2	90.0	100.0	93.0
			3	100.0	100.0	100.0
			Mean	96.7	100.0	97.3
11. GRAMOXONE 250 + BARON WP*	800 mL + 500 g	3 WAT	1	100.0	100.0	100.0
			2	99.0	99.0	90.0
			3	100.0	100.0	100.0
			Mean	99.7	99.7	96.7
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 300 mL	3 WAT	1	100.0	100.0	100.0
			2	100.0	95.0	99.0
			3	100.0	100.0	100.0
			Mean	100.0	98.3	99.7

DAT - days after transplanting; WAT - weeks after transplanting

\*DUAL GOLD applied at 0 DAT at 2000 mL/ha

### 11.2.11 Trial 2, Mangrove Mountain, NSW, Broccoli - Biomass Reduction Scale (0-100)

Treatment	Rate of Product/ha	Application Timing	Rep.	35 DAT 01-Jun-10	50 DAT 16-Jun-10
1. Control	2000 mL	Pre-plant	1	0.0	0.0
			2	0.0	0.0
			3	0.0	0.0
			Mean	0.0	0.0
2. BARON WP*	250 g	0 DAT	1	0.0	0.0
			2	0.0	0.0
			3	0.0	0.0
			Mean	0.0	0.0
3. BARON WP*	500 g	3 WAT	1	0.0	0.0
			2	0.0	5.0
			3	0.0	5.0
			Mean	0.0	3.3
4. SPOTLIGHT PLUS*	300 mL	3 WAT	1	9.0	9.0
			2	5.0	7.0
			3	8.0	6.0
			Mean	7.3	7.3
5. BASTA*	2.5 L	3 WAT	1	2.0	0.5
			2	1.0	2.0
			3	5.0	2.0
			Mean	2.7	1.5
6. GRAMOXONE 250*	800 mL	3 WAT	1	7.0	7.0
			2	8.0	7.0
			3	2.0	1.0
			Mean	5.7	5.0
7. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	0.0	0.0
			2	6.0	3.0
			3	1.0	0.0
			Mean	2.3	1.0
8. BASTA + BARON WP*	2.5 L + 500 g	3 WAT	1	2.0	2.0
			2	4.0	1.0
			3	0.0	0.0
			Mean	2.0	1.0
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 300 mL	3 WAT	1	8.0	8.0
			2	7.0	5.0
			3	7.0	5.0
			Mean	7.3	6.0
10. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	8.0	7.0
			2	7.0	7.0
			3	1.0	2.0
			Mean	5.3	5.3
11. GRAMOXONE 250 + BARON WP*	800 mL + 500 g	3 WAT	1	3.0	2.0
			2	3.0	3.0
			3	1.0	1.0
			Mean	2.3	2.0
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 300 mL	3 WAT	1	6.0	7.0
			2	3.0	2.0
			3	2.0	1.0
			Mean	3.7	3.3

DAT - days after transplanting; WAT - weeks after transplanting

\*DUAL GOLD applied at 0 DAT at 2000 mL/ha

## 11.2.12 Trial 2, Mangrove Mountain, NSW, Broccoli - Percentage Phytotoxicity

Treatment	Rate of Product/ha	Application Timing	Rep.	35 DAT 01-Jun-10	50 DAT 16-Jun-10
1. Control	2000 mL	Pre-plant	1	0.0	0.0
			2	0.0	0.0
			3	0.0	0.0
			Mean	0.0	0.0
2. BARON WP*	250 g	0 DAT	1	0.0	0.0
			2	0.0	0.0
			3	0.0	0.0
			Mean	0.0	0.0
3. BARON WP*	500 g	3 WAT	1	0.0	0.0
			2	0.0	0.0
			3	0.0	0.0
			Mean	0.0	0.0
4. SPOTLIGHT PLUS*	300 mL	3 WAT	1	90.0	80.0
			2	50.0	70.0
			3	80.0	60.0
			Mean	73.3	70.0
5. BASTA*	2.5 L	3 WAT	1	20.0	0.0
			2	10.0	20.0
			3	50.0	30.0
			Mean	26.7	16.7
6. GRAMOXONE 250*	800 mL	3 WAT	1	70.0	70.0
			2	80.0	80.0
			3	30.0	20.0
			Mean	60.0	56.7
7. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	0.0	0.0
			2	60.0	30.0
			3	10.0	0.0
			Mean	23.3	10.0
8. BASTA + BARON WP*	2.5 L + 500 g	3 WAT	1	20.0	10.0
			2	30.0	10.0
			3	0.0	0.0
			Mean	16.7	6.7
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 300 mL	3 WAT	1	80.0	80.0
			2	70.0	50.0
			3	70.0	60.0
			Mean	73.3	63.3
10. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	80.0	30.0
			2	80.0	80.0
			3	10.0	20.0
			Mean	56.7	43.3
11. GRAMOXONE 250 + BARON WP*	800 mL + 500 g	3 WAT	1	20.0	30.0
			2	30.0	30.0
			3	10.0	20.0
			Mean	20.0	26.7
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 300 mL	3 WAT	1	70.0	70.0
			2	30.0	20.0
			3	20.0	10.0
			Mean	40.0	33.3

DAT - days after transplanting; WAT - weeks after transplanting

\*DUAL GOLD applied at 0 DAT at 2000 mL/ha



### 11.2.13 Trial 2, Mangrove Mountain, NSW, Broccoli - Yield - kg/ha

Treatment	Rate of Product/ha	Application Timing	Rep.	97 DAT 02-Aug-10	101 DAT 06-Aug-10
1. Control	2000 mL	Pre-plant	1	4.740	2.050
			2	5.350	1.580
			3	5.970	3.140
			Mean	5.350	2.260
2. BARON WP*	250 g	0 DAT	1	1.130	0.330
			2	4.310	1.580
			3	3.520	1.740
			Mean	2.990	1.220
3. BARON WP*	500 g	3 WAT	1	4.120	2.390
			2	4.340	2.290
			3	0.740	0.660
			Mean	3.070	1.780
4. SPOTLIGHT PLUS*	300 mL	3 WAT	1	3.460	1.770
			2	4.050	1.910
			3	2.330	0.680
			Mean	3.280	1.450
5. BASTA*	2.5 L	3 WAT	1	2.660	2.040
			2	3.070	0.610
			3	7.750	1.990
			Mean	4.490	1.540
6. GRAMOXONE 250*	800 mL	3 WAT	1	4.700	1.180
			2	4.120	3.330
			3	7.770	1.690
			Mean	5.530	2.070
7. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	4.180	1.590
			2	3.360	1.360
			3	2.240	1.040
			Mean	3.260	1.330
8. BASTA + BARON WP*	2.5 L + 500 g	3 WAT	1	3.730	4.020
			2	4.030	2.800
			3	1.980	2.260
			Mean	3.250	3.030
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 300 mL	3 WAT	1	4.340	2.420
			2	6.330	1.730
			3	4.130	4.090
			Mean	4.930	2.750
10. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	6.840	2.170
			2	4.110	3.050
			3	4.500	2.410
			Mean	5.150	2.540
11. GRAMOXONE 250 + BARON WP*	800 mL + 500 g	3 WAT	1	5.570	1.840
			2	5.550	2.120
			3	7.240	1.330
			Mean	6.120	1.760
12. GRAMOXONE 250 + SPOTLIGHT PLUS* 800 mL + 300 mL	800 mL + 300 mL	3 WAT	1	6.410	2.340
			2	4.800	1.400
			3	2.510	2.530
			Mean	4.570	2.090

DAT - days after transplanting; WAT - weeks after transplanting

\*DUAL GOLD applied at 0 DAT at 2000 mL/ha

### 11.2.14 Trial 3, Werribee, Vic, Cauliflower - Marshmallow (*Malva parviflora*) Percentage Weed Control

Treatment	Rate of Product/ha	Application Timing	Rep.	35 DAT 31-Mar-10	56 DAT 21-Apr-10
1. Control		Pre-plant	1	0.0	0.0
			2	0.0	0.0
			3	0.0	0.0
			Mean	0.0	0.0
2. BARON WP*	2000 mL/ha	0 DAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
3. BARON WP*	250 g	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
4. SPOTLIGHT PLUS*	500 g	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
5. BASTA*	300 mL	3 WAT	1	100.0	100.0
			2	80.0	80.0
			3	100.0	100.0
			Mean	93.3	93.3
6. GRAMOXONE 250*	2.5 L	3 WAT	1	95.0	95.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	98.3	98.3
7. BASTA + BARON WP*	800 mL	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
8. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	100.0	100.0
			2	95.0	100.0
			3	100.0	95.0
			Mean	98.3	98.3
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 500 g	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	90.0
			Mean	100.0	96.7
10. GRAMOXONE 250 + BARON WP*	2.5 L + 300 mL	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	95.0
			Mean	100.0	98.3
11. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 500 g	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0

DAT - days after transplanting; WAT - weeks after transplanting

\*RIFLE 330 applied at 0 DAT 2500 mL/ha

**11.2.15 Trial 3, Werribee, Vic, Cauliflower - Stinging Nettle (*Urtica urens*)  
Percentage Weed Control**

Treatment	Rate of Product/ha	Application Timing	Rep.	35 DAT 31-Mar-10	56 DAT 21-Apr-10
1. Control		Pre-plant	1	0.0	0.0
			2	0.0	0.0
			3	0.0	0.0
			Mean	0.0	0.0
2. BARON WP*	2000 mL/ha	0 DAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
3. BARON WP*	250 g	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
4. SPOTLIGHT PLUS*	500 g	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
5. BASTA*	300 mL	3 WAT	1	100.0	100.0
			2	80.0	80.0
			3	100.0	100.0
			Mean	93.3	93.3
6. GRAMOXONE 250*	2.5 L	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
7. BASTA + BARON WP*	800 mL	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
8. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 500 g	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
10. GRAMOXONE 250 + BARON WP*	2.5 L + 300 mL	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
11. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 500 g	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	0.0
			Mean	100.0	66.7

DAT - days after transplanting; WAT - weeks after transplanting

\*RIFLE 330 applied at 0 DAT 2500 mL/ha

### 11.2.16 Trial 3, Werribee, Vic, Cauliflower - Shepherd's Purse (*Capsella bursa-pastoris*) Percentage Weed Control

Treatment	Rate of Product/ha	Application Timing	Rep.	35 DAT 31-Mar-10	56 DAT 21-Apr-10
1. Control		Pre-plant	1	0.0	0.0
			2	0.0	0.0
			3	0.0	0.0
			Mean	0.0	0.0
2. BARON WP*	2000 mL/ha	0 DAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
3. BARON WP*	250 g	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
4. SPOTLIGHT PLUS*	500 g	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
5. BASTA*	300 mL	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
6. GRAMOXONE 250*	2.5 L	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
7. BASTA + BARON WP*	800 mL	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
8. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 500 g	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
10. GRAMOXONE 250 + BARON WP*	2.5 L + 300 mL	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
11. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 500 g	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0

DAT - days after transplanting; WAT - weeks after transplanting

\*RIFLE 330 applied at 0 DAT 2500 mL/ha

### 11.2.17 Trial 3, Werribee, Vic, Cauliflower - Groundsel (*Senecio* sp) Percentage Weed Control

Treatment	Rate of Product/ha	Application Timing	Rep.	35 DAT 31-Mar-10	56 DAT 21-Apr-10
1. Control		Pre-plant	1	0.0	0.0
			2	0.0	0.0
			3	0.0	0.0
			Mean	0.0	0.0
2. BARON WP*	2000 mL/ha	0 DAT	1	100.0	100.0
			2	90.0	90.0
			3	90.0	90.0
			Mean	93.3	93.3
3. BARON WP*	250 g	3 WAT	1	100.0	100.0
			2	100.0	90.0
			3	98.0	90.0
			Mean	99.3	93.3
4. SPOTLIGHT PLUS*	500 g	3 WAT	1	90.0	90.0
			2	90.0	90.0
			3	90.0	90.0
			Mean	90.0	90.0
5. BASTA*	300 mL	3 WAT	1	95.0	95.0
			2	80.0	80.0
			3	100.0	90.0
			Mean	91.7	88.3
6. GRAMOXONE 250*	2.5 L	3 WAT	1	95.0	95.0
			2	90.0	90.0
			3	100.0	90.0
			Mean	95.0	91.7
7. BASTA + BARON WP*	800 mL	3 WAT	1	100.0	100.0
			2	100.0	95.0
			3	98.0	90.0
			Mean	99.3	95.0
8. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	100.0	100.0
			2	95.0	95.0
			3	100.0	90.0
			Mean	98.3	95.0
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 500 g	3 WAT	1	100.0	100.0
			2	90.0	90.0
			3	90.0	90.0
			Mean	93.3	93.3
10. GRAMOXONE 250 + BARON WP*	2.5 L + 300 mL	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	90.0
			Mean	100.0	96.7
11. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	90.0	90.0
			Mean	96.7	96.7
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 500 g	3 WAT	1	90.0	90.0
			2	100.0	100.0
			3	95.0	95.0
			Mean	95.0	95.0

DAT - days after transplanting; WAT - weeks after transplanting

\*RIFLE 330 applied at 0 DAT 2500 mL/ha

**11.2.18 Trial 3, Werribee, Vic, Cauliflower - Sowthistle (*Sonchus oleraceus*)  
Percentage Weed Control**

Treatment	Rate of Product/ha	Application Timing	Rep.	35 DAT 31-Mar-10	56 DAT 21-Apr-10
1. Control		Pre-plant	1	0.0	0.0
			2	0.0	0.0
			3	0.0	0.0
			Mean	0.0	0.0
2. BARON WP*	2000 mL/ha	0 DAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
3. BARON WP*	250 g	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
4. SPOTLIGHT PLUS*	500 g	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
5. BASTA*	300 mL	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
6. GRAMOXONE 250*	2.5 L	3 WAT	1	100.0	100.0
			2	90.0	90.0
			3	100.0	100.0
			Mean	96.7	96.7
7. BASTA + BARON WP*	800 mL	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
8. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 500 g	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
10. GRAMOXONE 250 + BARON WP*	2.5 L + 300 mL	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
11. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 500 g	3 WAT	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0

DAT - days after transplanting; WAT - weeks after transplanting

\*RIFLE 330 applied at 0 DAT 2500 mL/ha

### 11.2.19 Trial 3, Werribee, Vic, Cauliflower - Crop Vigour (Scale 0-100)

Treatment	Rate of Product/ha	Application Timing	Rep.	35 DAT 31-Mar-10	56 DAT 21-Apr-10
1. Control		Pre-plant	1	100.0	100.0
			2	100.0	100.0
			3	100.0	100.0
			Mean	100.0	100.0
2. BARON WP*	2000 mL/ha	0 DAT	1	90.0	100.0
			2	80.0	100.0
			3	90.0	100.0
			Mean	86.7	100.0
3. BARON WP*	250 g	3 WAT	1	90.0	100.0
			2	90.0	100.0
			3	80.0	90.0
			Mean	86.7	96.7
4. SPOTLIGHT PLUS*	500 g	3 WAT	1	90.0	100.0
			2	60.0	80.0
			3	90.0	100.0
			Mean	80.0	93.3
5. BASTA*	300 mL	3 WAT	1	80.0	80.0
			2	90.0	100.0
			3	90.0	100.0
			Mean	86.7	93.3
6. GRAMOXONE 250*	2.5 L	3 WAT	1	90.0	100.0
			2	80.0	90.0
			3	90.0	90.0
			Mean	86.7	93.3
7. BASTA + BARON WP*	800 mL	3 WAT	1	80.0	90.0
			2	80.0	100.0
			3	90.0	90.0
			Mean	83.3	93.3
8. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	70.0	80.0
			2	90.0	90.0
			3	80.0	100.0
			Mean	80.0	90.0
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 500 g	3 WAT	1	80.0	80.0
			2	90.0	100.0
			3	80.0	90.0
			Mean	83.3	90.0
10. GRAMOXONE 250 + BARON WP*	2.5 L + 300 mL	3 WAT	1	70.0	80.0
			2	70.0	90.0
			3	70.0	100.0
			Mean	70.0	90.0
11. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	80.0	80.0
			2	90.0	100.0
			3	90.0	90.0
			Mean	86.7	90.0
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 500 g	3 WAT	1	90.0	100.0
			2	90.0	90.0
			3	70.0	100.0
			Mean	83.3	96.7

DAT - days after transplanting; WAT - weeks after transplanting

\*RIFLE 330 applied at 0 DAT 2500 mL/ha

### 11.2.20 Trial 3, Werribee, Vic, Cauliflower - Percentage Crop Phytotoxicity

Treatment	Rate of Product/ha	Application Timing	Rep.	35 DAT 31-Mar-10	56 DAT 21-Apr-10
1. Control		Pre-plant	1	0.0	0.0
			2	0.0	0.0
			3	0.0	0.0
			Mean	0.0	0.0
2. BARON WP*	2000 mL/ha	0 DAT	1	10.0	0.0
			2	10.0	0.0
			3	5.0	0.0
			Mean	8.3	0.0
3. BARON WP*	250 g	3 WAT	1	5.0	0.0
			2	5.0	0.0
			3	15.0	0.0
			Mean	8.3	0.0
4. SPOTLIGHT PLUS*	500 g	3 WAT	1	15.0	0.0
			2	30.0	2.5
			3	10.0	0.0
			Mean	18.3	0.8
5. BASTA*	300 mL	3 WAT	1	20.0	5.0
			2	10.0	2.5
			3	10.0	0.0
			Mean	13.3	2.5
6. GRAMOXONE 250*	2.5 L	3 WAT	1	20.0	0.0
			2	10.0	0.0
			3	10.0	0.0
			Mean	13.3	0.0
7. BASTA + BARON WP*	800 mL	3 WAT	1	20.0	0.0
			2	20.0	0.0
			3	10.0	0.0
			Mean	16.7	0.0
8. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	15.0	5.0
			2	10.0	0.0
			3	5.0	0.0
			Mean	10.0	1.7
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 500 g	3 WAT	1	10.0	0.0
			2	10.0	0.0
			3	15.0	0.0
			Mean	11.7	0.0
10. GRAMOXONE 250 + BARON WP*	2.5 L + 300 mL	3 WAT	1	20.0	5.0
			2	20.0	0.0
			3	10.0	0.0
			Mean	16.7	1.7
11. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	15.0	0.0
			2	15.0	0.0
			3	10.0	0.0
			Mean	13.3	0.0
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 500 g	3 WAT	1	5.0	0.0
			2	20.0	0.0
			3	20.0	0.0
			Mean	15.0	0.0

DAT - days after transplanting; WAT - weeks after transplanting

\*RIFLE 330 applied at 0 DAT 2500 mL/ha



### 11.2.21 Trial 3, Werribee, Vic, Cauliflower - Weed Count per 0.1m<sup>2</sup>

Treatment	Rate of Product/ha	Application Timing	Rep.	Marshmallow 21-Apr-10	Stinging Nettle 21-Apr-10	Shepherd purse 21-Apr-10	Groundsel 21-Apr-10	Sowthistle 21-Apr-10
1. Control		Pre-plant	1	6.0	5.0	4.0	12.0	1.0
			2	3.0	0.0	2.0	5.0	3.0
			3	2.0	1.0	3.0	6.0	3.0
			Mean	3.7	2.0	3.0	7.7	2.3
2. BARON WP*	2000 mL/ha	0 DAT	1	0.0	0.0	0.0	0.0	0.0
			2	0.0	0.0	0.0	10.0	0.0
			3	0.0	0.0	0.0	4.0	0.0
			Mean	0.0	0.0	0.0	4.7	0.0
3. BARON WP*	250 g	3 WAT	1	0.0	0.0	0.0	0.0	0.0
			2	0.0	0.0	0.0	2.0	0.0
			3	0.0	0.0	0.0	1.0	0.0
			Mean	0.0	0.0	0.0	1.0	0.0
4. SPOTLIGHT PLUS*	500 g	3 WAT	1	0.0	0.0	0.0	4.0	0.0
			2	0.0	0.0	0.0	2.0	0.0
			3	0.0	0.0	0.0	1.0	0.0
			Mean	0.0	0.0	0.0	2.3	0.0
5. BASTA*	300 mL	3 WAT	1	0.0	0.0	0.0	1.0	0.0
			2	3.0	1.0	0.0	9.0	0.0
			3	0.0	0.0	0.0	1.0	0.0
			Mean	1.0	0.3	0.0	3.7	0.0
6. GRAMOXONE 250*	2.5 L	3 WAT	1	1.0	0.0	0.0	2.0	0.0
			2	0.0	0.0	0.0	3.0	1.0
			3	0.0	0.0	0.0	3.0	0.0
			Mean	0.3	0.0	0.0	2.7	0.3
7. BASTA + BARON WP*	800 mL	3 WAT	1	0.0	0.0	0.0	0.0	0.0
			2	0.0	0.0	0.0	1.0	0.0
			3	0.0	0.0	0.0	1.0	0.0
			Mean	0.0	0.0	0.0	0.7	0.0
8. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	0.0	0.0	0.0	0.0	0.0
			2	0.0	0.0	0.0	2.0	0.0
			3	1.0	0.0	0.0	1.0	0.0
			Mean	0.3	0.0	0.0	1.0	0.0
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 500 g	3 WAT	1	0.0	0.0	0.0	0.0	0.0
			2	0.0	0.0	0.0	2.0	0.0
			3	2.0	0.0	0.0	5.0	0.0
			Mean	0.7	0.0	0.0	2.3	0.0
10. GRAMOXONE 250 + BARON WP*	2.5 L + 300 mL	3 WAT	1	0.0	0.0	0.0	0.0	0.0
			2	0.0	0.0	0.0	0.0	0.0
			3	1.0	0.0	0.0	1.0	0.0
			Mean	0.3	0.0	0.0	0.3	0.0
11. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	0.0	0.0	0.0	0.0	0.0
			2	0.0	0.0	0.0	0.0	0.0
			3	0.0	0.0	0.0	1.0	0.0
			Mean	0.0	0.0	0.0	0.3	0.0
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 500 g	3 WAT	1	0.0	0.0	0.0	6.0	0.0
			2	0.0	0.0	0.0	0.0	0.0
			3	3.0	10.0	0.0	6.0	0.0
			Mean	1.0	3.3	0.0	4.0	0.0

DAT - days after transplanting; WAT - weeks after transplanting

\*RIFLE 330 applied at 0 DAT 2500 mL/ha

### 11.2.22 Trial 3, Werribee, Vic, Cauliflower - Yield kg/ha

Treatment	Rate of Product/ha	Application Timing	Rep.	89 DAT 24-May	93 DAT 28-May	99 DAT 3-Jun
1. Control		Pre-plant	1	2.180	2.027	1.450
			2	2.490	1.815	1.890
			3	2.094	1.818	1.720
			Mean	2.255	1.887	1.687
2. BARON WP*	2000 mL/ha	0 DAT	1	2.480	1.911	1.767
			2	2.770	1.660	1.660
			3	2.138	2.060	1.850
			Mean	2.463	1.877	1.759
3. BARON WP*	250 g	3 WAT	1	1.860	2.019	2.010
			2	2.366	1.940	1.920
			3	2.060	1.858	1.910
			Mean	2.095	1.939	1.947
4. SPOTLIGHT PLUS*	500 g	3 WAT	1	2.108	1.737	1.778
			2	1.887	1.736	1.740
			3	2.098	1.886	1.740
			Mean	2.031	1.786	1.753
5. BASTA*	300 mL	3 WAT	1	1.774	1.863	1.360
			2	1.998	1.850	2.010
			3	1.990	1.712	1.787
			Mean	1.921	1.808	1.719
6. GRAMOXONE 250*	2.5 L	3 WAT	1	1.961	1.900	1.660
			2	2.120	1.833	2.000
			3	2.035	1.700	1.940
			Mean	2.039	1.811	1.867
7. BASTA + BARON WP*	800 mL	3 WAT	1	2.240	2.083	1.640
			2	2.337	1.692	1.766
			3	2.000	1.729	1.760
			Mean	2.192	1.835	1.722
8. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	2.046	1.675	1.910
			2	2.057	1.585	1.977
			3	2.000	1.707	1.547
			Mean	2.034	1.656	1.811
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 500 g	3 WAT	1	2.090	1.750	1.680
			2	2.100	1.829	1.820
			3	2.132	1.783	2.310
			Mean	2.107	1.787	1.937
10. GRAMOXONE 250 + BARON WP*	2.5 L + 300 mL	3 WAT	1	1.938	1.734	1.712
			2	2.090	1.820	1.700
			3	1.783	1.850	2.010
			Mean	1.937	1.801	1.807
11. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	2.287	1.729	1.900
			2	1.990	1.729	1.548
			3	1.968	1.741	1.755
			Mean	2.081	1.733	1.734
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 500 g	3 WAT	1	2.920	1.840	1.880
			2	2.113	1.838	1.700
			3	2.325	1.633	2.050
			Mean	2.453	1.770	1.877

DAT - days after transplanting; WAT - weeks after transplanting

\*RIFLE 330 applied at 0 DAT 2500 mL/ha

### 11.2.23 Trial 4, Nairne, SA, Brussels Sprouts - Weed Count per 1m<sup>2</sup>

Treatment	Rate of Product/ha	Application Timing	Rep.	28 DAT 19-Feb-10	59 DAT 24-Mar-10	63 DAT 01-Apr-10	77 DAT 15-Apr-10
1. Control		Pre-plant	1	2.40	0.90	1.60	0.00
			2	3.70	1.40	1.30	0.00
			3	3.80	1.20	1.10	0.00
			Mean	3.30	1.17	1.33	0.00
2. BARON WP*	2000 mL/ha	0 DAT	1	0.00	0.00	0.00	100.00
			2	0.00	0.00	0.00	100.00
			3	0.00	0.00	0.00	100.00
			Mean	0.00	0.00	0.00	100.00
3. BARON WP*	250 g	3 WAT	1	0.00	0.00	0.00	100.00
			2	0.00	0.00	0.00	100.00
			3	0.00	0.00	0.00	100.00
			Mean	0.00	0.00	0.00	100.00
4. SPOTLIGHT PLUS*	500 g	3 WAT	1	0.00	0.00	0.00	100.00
			2	1.80	0.00	0.00	100.00
			3	0.00	0.00	1.20	98.00
			Mean	0.60	0.00	0.40	99.33
5. BASTA*	300 mL	3 WAT	1	0.00	0.00	0.00	100.00
			2	0.00	0.00	0.00	100.00
			3	0.00	0.00	0.00	100.00
			Mean	0.00	0.00	0.00	100.00
6. GRAMOXONE 250*	2.5 L	3 WAT	1	0.00	0.00	0.00	100.00
			2	0.00	0.00	0.00	100.00
			3	0.00	0.00	0.00	100.00
			Mean	0.00	0.00	0.00	100.00
7. BASTA + BARON WP*	800 mL	3 WAT	1	0.00	0.00	0.00	100.00
			2	0.00	0.00	0.00	100.00
			3	0.00	0.00	0.00	100.00
			Mean	0.00	0.00	0.00	100.00
8. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	0.00	0.00	0.00	100.00
			2	0.00	0.00	0.00	100.00
			3	0.00	0.00	0.00	100.00
			Mean	0.00	0.00	0.00	100.00
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 500 g	3 WAT	1	0.00	0.00	0.00	100.00
			2	0.00	0.00	0.00	100.00
			3	0.00	0.00	0.00	100.00
			Mean	0.00	0.00	0.00	100.00
10. GRAMOXONE 250 + BARON WP*	2.5 L + 300 mL	3 WAT	1	0.00	0.00	0.00	100.00
			2	0.00	0.00	0.00	100.00
			3	0.00	0.00	0.00	100.00
			Mean	0.00	0.00	0.00	100.00
11. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	0.00	0.00	0.00	100.00
			2	0.00	0.00	0.00	100.00
			3	0.00	0.00	0.00	100.00
			Mean	0.00	0.00	0.00	100.00
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 500 g	3 WAT	1	0.00	0.00	0.00	100.00
			2	0.00	0.00	0.00	100.00
			3	0.00	0.00	0.00	100.00
			Mean	0.00	0.00	0.00	100.00

DAT - days after transplanting; WAT - weeks after transplanting

\*DUAL GOLD applied at 0 DAT at 1500 mL/ha

**11.2.24 Trial 4, Nairne, SA, Brussels Sprouts - Wireweed (*Polygonum aviculare*)  
Percentage Weed Control**

Treatment	Rate of Product/ha	Application Timing	Rep.	28 DAT 19-Feb-10	59 DAT 24-Mar-10	63 DAT 01-Apr-10	77 DAT 15-Apr-10
1. Control		Pre-plant	1	0.00	0.00	0.00	0.00
			2	0.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
2. BARON WP*	2000 mL/ha	0 DAT	1	78.00	95.00	100.00	100.00
			2	80.00	90.00	100.00	100.00
			3	65.00	90.00	100.00	100.00
			Mean	74.33	91.67	100.00	100.00
3. BARON WP*	250 g	3 WAT	1	75.00	100.00	100.00	100.00
			2	85.00	90.00	100.00	100.00
			3	90.00	95.00	100.00	100.00
			Mean	83.33	95.00	100.00	100.00
4. SPOTLIGHT PLUS*	500 g	3 WAT	1	94.00	100.00	100.00	100.00
			2	95.00	100.00	100.00	100.00
			3	98.00	95.00	100.00	100.00
			Mean	95.67	98.33	100.00	100.00
5. BASTA*	300 mL	3 WAT	1	90.00	95.00	100.00	100.00
			2	100.00	85.00	95.00	100.00
			3	95.00	100.00	100.00	100.00
			Mean	95.00	93.33	98.33	100.00
6. GRAMOXONE 250*	2.5 L	3 WAT	1	97.00	100.00	100.00	100.00
			2	98.00	100.00	100.00	100.00
			3	98.00	100.00	100.00	95.00
			Mean	97.67	100.00	100.00	98.33
7. BASTA + BARON WP*	800 mL	3 WAT	1	98.00	100.00	100.00	100.00
			2	95.00	95.00	100.00	100.00
			3	90.00	95.00	100.00	100.00
			Mean	94.33	96.67	100.00	100.00
8. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	95.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	95.00	98.00	100.00	100.00
			Mean	96.67	99.33	100.00	100.00
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 500 g	3 WAT	1	95.00	100.00	100.00	100.00
			2	98.00	100.00	100.00	100.00
			3	95.00	100.00	100.00	100.00
			Mean	96.00	100.00	100.00	100.00
10. GRAMOXONE 250 + BARON WP*	2.5 L + 300 mL	3 WAT	1	100.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00
11. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	100.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 500 g	3 WAT	1	100.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00

DAT - days after transplanting; WAT - weeks after transplanting

\*DUAL GOLD applied at 0 DAT at 1500 mL/ha

**11.2.25 Trial 4, Nairne, SA, Brussels Sprouts - Fat Hen (*Chenopodium album*)  
Percentage Weed Control**

Treatment	Rate of Product/ha	Application Timing	Rep.	28 DAT 19-Feb-10	59 DAT 24-Mar-10	63 DAT 01-Apr-10	77 DAT 15-Apr-10
1. Control		Pre-plant	1	0.00	0.00	0.00	0.00
			2	0.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
2. BARON WP*	2000 mL/ha	0 DAT	1	90.00	100.00	100.00	100.00
			2	90.00	90.00	100.00	100.00
			3	90.00	90.00	100.00	100.00
			Mean	90.00	93.33	100.00	100.00
3. BARON WP*	250 g	3 WAT	1	92.00	100.00	100.00	100.00
			2	95.00	90.00	100.00	100.00
			3	95.00	98.00	100.00	100.00
			Mean	94.00	96.00	100.00	100.00
4. SPOTLIGHT PLUS*	500 g	3 WAT	1	95.00	100.00	100.00	100.00
			2	98.00	100.00	100.00	100.00
			3	100.00	98.00	100.00	100.00
			Mean	97.67	99.33	100.00	100.00
5. BASTA*	300 mL	3 WAT	1	95.00	100.00	100.00	100.00
			2	98.00	95.00	100.00	100.00
			3	95.00	100.00	100.00	100.00
			Mean	96.00	98.33	100.00	100.00
6. GRAMOXONE 250*	2.5 L	3 WAT	1	100.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	98.00
			Mean	100.00	100.00	100.00	99.33
7. BASTA + BARON WP*	800 mL	3 WAT	1	100.00	100.00	100.00	100.00
			2	95.00	95.00	100.00	100.00
			3	96.00	98.00	100.00	100.00
			Mean	97.00	97.67	100.00	100.00
8. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	95.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	95.00	98.00	100.00	100.00
			Mean	96.67	99.33	100.00	100.00
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 500 g	3 WAT	1	95.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	95.00	100.00	100.00	100.00
			Mean	96.67	100.00	100.00	100.00
10. GRAMOXONE 250 + BARON WP*	2.5 L + 300 mL	3 WAT	1	100.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00
11. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	100.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 500 g	3 WAT	1	100.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00

DAT - days after transplanting; WAT - weeks after transplanting

\*DUAL GOLD applied at 0 DAT at 1500 mL/ha

**11.2.26 Trial 4, Nairne, SA, Brussels Sprouts - Capeweed (*Arctotheca calendula*)  
Percentage Weed Control**

Treatment	Rate of Product/ha	Application Timing	Rep.	28 DAT 19-Feb-10	59 DAT 24-Mar-10	63 DAT 01-Apr-10	77 DAT 15-Apr-10
1. Control		Pre-plant	1	0.00	0.00	0.00	0.00
			2	0.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
2. BARON WP*	2000 mL/ha	0 DAT	1	95.00	100.00	100.00	100.00
			2	95.00	90.00	100.00	100.00
			3	95.00	95.00	100.00	100.00
			Mean	95.00	95.00	100.00	100.00
3. BARON WP*	250 g	3 WAT	1	90.00	100.00	100.00	100.00
			2	95.00	100.00	100.00	100.00
			3	95.00	100.00	100.00	100.00
			Mean	93.33	100.00	100.00	100.00
4. SPOTLIGHT PLUS*	500 g	3 WAT	1	100.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00
5. BASTA*	300 mL	3 WAT	1	98.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	95.00	100.00	100.00	100.00
			Mean	97.67	100.00	100.00	100.00
6. GRAMOXONE 250*	2.5 L	3 WAT	1	100.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	98.00
			Mean	100.00	100.00	100.00	99.33
7. BASTA + BARON WP*	800 mL	3 WAT	1	100.00	100.00	100.00	100.00
			2	98.00	100.00	100.00	100.00
			3	98.00	100.00	100.00	100.00
			Mean	98.67	100.00	100.00	100.00
8. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	95.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	98.00	100.00	100.00	100.00
			Mean	97.67	100.00	100.00	100.00
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 500 g	3 WAT	1	95.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	98.33	100.00	100.00	100.00
10. GRAMOXONE 250 + BARON WP*	2.5 L + 300 mL	3 WAT	1	100.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00
11. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	100.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 500 g	3 WAT	1	100.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00

DAT - days after transplanting; WAT - weeks after transplanting

\*DUAL GOLD applied at 0 DAT at 1500 mL/ha

### 11.2.27 Trial 4, Nairne, SA, Brussels Sprouts - Vigour (Scale 0-100)

Treatment	Rate of Product/ha	Application Timing	Rep.	28 DAT 19-Feb-10	59 DAT 24-Mar-10	63 DAT 01-Apr-10	77 DAT 15-Apr-10
1. Control		Pre-plant	1	100.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00
2. BARON WP*	2000 mL/ha	0 DAT	1	100.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	100.00	100.00	100.00	100.00
			Mean	100.00	100.00	100.00	100.00
3. BARON WP*	250 g	3 WAT	1	100.00	100.00	100.00	100.00
			2	100.00	100.00	100.00	100.00
			3	95.00	100.00	100.00	100.00
			Mean	98.33	100.00	100.00	100.00
4. SPOTLIGHT PLUS*	500 g	3 WAT	1	88.00	85.00	90.00	95.00
			2	84.00	80.00	85.00	90.00
			3	85.00	80.00	88.00	92.00
			Mean	85.67	81.67	87.67	92.33
5. BASTA*	300 mL	3 WAT	1	95.00	100.00	100.00	100.00
			2	90.00	92.00	95.00	96.00
			3	90.00	92.00	94.00	94.00
			Mean	91.67	94.67	96.33	96.67
6. GRAMOXONE 250*	2.5 L	3 WAT	1	90.00	85.00	82.00	90.00
			2	90.00	80.00	74.00	88.00
			3	86.00	75.00	76.00	88.00
			Mean	88.67	80.00	77.33	88.67
7. BASTA + BARON WP*	800 mL	3 WAT	1	92.00	97.00	100.00	100.00
			2	95.00	100.00	100.00	100.00
			3	93.00	100.00	100.00	100.00
			Mean	93.33	99.00	100.00	100.00
8. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	95.00	100.00	100.00	100.00
			2	92.00	100.00	100.00	100.00
			3	90.00	95.00	97.00	100.00
			Mean	92.33	98.33	99.00	100.00
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 500 g	3 WAT	1	88.00	82.00	90.00	94.00
			2	85.00	80.00	88.00	92.00
			3	82.00	76.00	84.00	90.00
			Mean	85.00	79.33	87.33	92.00
10. GRAMOXONE 250 + BARON WP*	2.5 L + 300 mL	3 WAT	1	88.00	74.00	80.00	85.00
			2	85.00	72.00	76.00	85.00
			3	84.00	65.00	72.00	82.00
			Mean	85.67	70.33	76.00	84.00
11. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	85.00	80.00	75.00	85.00
			2	82.00	65.00	72.00	82.00
			3	85.00	60.00	65.00	80.00
			Mean	84.00	68.33	70.67	82.33
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 500 g	3 WAT	1	85.00	75.00	80.00	88.00
			2	85.00	70.00	78.00	88.00
			3	88.00	70.00	75.00	85.00
			Mean	86.00	71.67	77.67	87.00

DAT - days after transplanting; WAT - weeks after transplanting

\*DUAL GOLD applied at 0 DAT at 1500 mL/ha

## 11.2.28 Trial 4, Nairne, SA, Brussels Sprouts - Percentage Crop Phytotoxicity

Treatment	Rate of Product/ha	Application Timing	Rep.	28 DAT 19-Feb-10	59 DAT 24-Mar-10	63 DAT 01-Apr-10	77 DAT 15-Apr-10
1. Control		Pre-plant	1	0.00	0.00	0.00	0.00
			2	0.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
2. BARON WP*	2000 mL/ha	0 DAT	1	0.00	0.00	0.00	0.00
			2	0.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
3. BARON WP*	250 g	3 WAT	1	0.00	0.00	0.00	0.00
			2	0.00	0.00	0.00	0.00
			3	0.00	0.00	0.00	0.00
			Mean	0.00	0.00	0.00	0.00
4. SPOTLIGHT PLUS*	500 g	3 WAT	1	5.00	0.00	0.00	0.00
			2	2.00	10.00	5.00	0.00
			3	12.00	10.00	5.00	0.00
			Mean	6.33	6.67	3.33	0.00
5. BASTA*	300 mL	3 WAT	1	8.00	5.00	0.00	0.00
			2	5.00	0.00	0.00	0.00
			3	10.00	8.00	5.00	0.00
			Mean	7.67	4.33	1.67	0.00
6. GRAMOXONE 250*	2.5 L	3 WAT	1	14.00	15.00	10.00	5.00
			2	20.00	20.00	10.00	5.00
			3	24.00	20.00	12.00	6.00
			Mean	19.33	18.33	10.67	5.33
7. BASTA + BARON WP*	800 mL	3 WAT	1	10.00	8.00	5.00	0.00
			2	12.00	12.00	8.00	3.00
			3	14.00	10.00	8.00	2.00
			Mean	12.00	10.00	7.00	1.67
8. BASTA + BARON WP*	2.5 L + 250 g	3 WAT	1	12.00	10.00	5.00	0.00
			2	18.00	15.00	10.00	3.00
			3	16.00	12.00	8.00	0.00
			Mean	15.33	12.33	7.67	1.00
9. BASTA + SPOTLIGHT PLUS*	2.5 L + 500 g	3 WAT	1	16.00	8.00	5.00	0.00
			2	15.00	10.00	5.00	2.00
			3	18.00	12.00	5.00	2.00
			Mean	16.33	10.00	5.00	1.33
10. GRAMOXONE 250 + BARON WP*	2.5 L + 300 mL	3 WAT	1	18.00	12.00	8.00	4.00
			2	25.00	16.00	10.00	6.00
			3	26.00	15.00	10.00	8.00
			Mean	23.00	14.33	9.33	6.00
11. GRAMOXONE 250 + BARON WP*	800 mL + 250 g	3 WAT	1	25.00	20.00	15.00	5.00
			2	28.00	32.00	25.00	12.00
			3	28.00	30.00	18.00	10.00
			Mean	27.00	27.33	19.33	9.00
12. GRAMOXONE 250 + SPOTLIGHT PLUS*	800 mL + 500 g	3 WAT	1	28.00	25.00	18.00	10.00
			2	30.00	28.00	20.00	12.00
			3	30.00	30.00	20.00	15.00
			Mean	29.33	27.67	19.33	12.33

DAT - days after transplanting; WAT - weeks after transplanting

\*DUAL GOLD applied at 0 DAT at 1500 mL/ha



Controlling Weeds  
in Broccoli, Cauliflower  
and Brussels Sprouts

# A Guide to Effective Weed Control in Australian Brassicas



## Background

Effective weed management is an essential requirement for reliably achieving high quality brassica produce. By taking a long term view of weed management and adopting an integrated weed management system, you can consistently control the weeds that compete with brassica crops.

In-crop weed management requires a long term integrated approach. Weed management commences prior to planting of the crop and does not stop until the crop has been harvested and residual produce/weeds are destroyed or cultivated.

This long term approach requires attention to both current and future brassica crops. There are several methods and herbicide options available.

Conducting all activities at the right time is the key to successful integrated weed control. Being too late reduces effectiveness and can lead to poor weed control.

## Key Points

- Reduce the seed bank prior to planting
- Transplant into weed free beds
- Apply appropriate pre-emergence herbicides before and/or immediately post transplanting
- Herbicides MUST be used correctly
- Inter-row cultivate OR use knockdown herbicide through protected sprayers to control weeds later in the crop as required
- Post-harvest clean up is essential

## Introduction

This brochure is a guide to integrated weed management in Australian broccoli, cauliflower and Brussels sprout crops. It provides an overview of weed management methods in these crops based on research conducted for Horticulture Australia Limited. There are 3 key steps to effective weed management. These are:

1. Planning your rotations
2. Identify your weeds
3. Develop your weed management strategy

If the person doing the work can reasonably answer these questions, then they will have greater directness about their work, its importance and impact for them. The person will feel more confident in contributing more of themselves to the doing of the work.



*"The Vegetable Industry Development Program is funded by HAL using the vegetable levy and matched funds from the Australian Government".*



# Vegetable Industry Development Program

## Step 1: Rotations and Planning

The first step in effective weed management is to plan your strategy. Adoption of a long term view of how you intend to combat weeds includes considering:

- Your crop rotation
- How you want to carry out each weed control stage, and
- Which herbicides or method you need.

The use of rotation crops in which problem weeds can be more easily controlled will help to reduce seed banks prior to planting. Good weed control between crops is easy to achieve and can be done using knockdown herbicides such as glyphosate or paraquat and through cultivation. The use of cover or green manure crops will also aid in reducing weed seed banks and are an essential part of a long term integrated weed management system.

## Key Points

- Use rotation crops to control weed seed banks between brassica crops
- Using herbicides at the right time is crucial

## Step 2: Identify Your Weeds

The key to getting the most from an integrated weed management system is to understand the weeds which will be a problem in your crop.

To most growers this will come from experience in individual blocks and from observation of the major weeds present in your district.

There are two main groups of weeds that cause problems in vegetable brassicas in Australia;

- broadleaf weeds, and
- grass weeds.

It is important to identify which weeds are present in your crops as herbicides and control methods will vary accordingly. With this knowledge a weed control plan can be developed which should give 'best possible' outcomes for that weed or weed spectrum.

11 key broadleaf weeds have been identified that cause problems to brassicas in Australia. Grass weeds are seldom a problem in brassica crops as they are controlled by the management strategies used for broadleaf weeds. A range of products are registered for their control.

## Key Points

- Identifying present weeds will determine which herbicide you can use
- Grass weeds do not need to be considered but can be a problem if knockdown herbicides are not used





# Vegetable Industry Development Program

## Step 3: Develop Your Weed Management Strategy

There are five possible stages in which weed control will be most effective. These are pre-planting, transplanting, early in-crop and late in-crop, post-harvest and when the paddock is fallow. There are several options per stage depending on your strategy and the density and diversity of the weed population.

### Pre-Planting

In-crop weed management is easier and more effective where longer rotations and suitable break crops to reduce weed seed bank are used.

However in intensive production systems where crop rotations times are tight this option can be difficult. Getting crop rotation correct and minimising weed populations in the previous crop will reduce weed pressure in the current crop.

Successful weed control commences with transplanting into a weed free seed bed. Best results are obtained using a combination of cultural and chemical controls. There are two main options:

#### Option 1

Form beds well before planting, irrigate to germinate an initial flush of weeds. These weeds can be controlled by spraying with a knockdown herbicide. Alternatively, weeds can be controlled with a very shallow cultivation.

#### Option 2

Form beds just before planting, with a final cultivation to prepare the seedbed and control any emerged weeds. This is discouraged in paddocks with substantial weed burdens, but does minimise pre-plant herbicide applications.

Herbicide options in the pre-plant management phase are all knockdown herbicides with no residual activity. The options at this time are glyphosate, paraquat or diquat. The choice of the correct herbicide will depend upon the weeds present, their size and the herbicide cost. It is best to apply these products when weeds are small as lower rates can be used and better coverage obtained leading to more effective control at lower cost.

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### Broadleaf Weeds

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- Wild Radish, *Raphanus raphanistrum*
- Redroot Amaranth / Prince-of-Wales Feather, *Amaranthus spp.*
- Hogweed / Wireweed, *Polygonum aviculare*
- Black Berry Nightshade, *Solanum nigrum*
- Pigweed, *Portulaca oleracea*
- Sowthistle / Milk Thistle, *Sonchus spp.*
- Fat Hen, *Chenopodium album*
- Wild Turnip, *Brassica spp.*
- Annual Nettle / Stinging Nettle, *Urtica urens*
- Chickweed, *Stellaria media (suppression)*
- Shepherd's purse, *Capsella bursa-pastoris*

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### Grass Weeds

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- Annual ryegrass, *Lolium rigidum*
  - Winter grass, *Poa annua*
  - Barnyard grass, *Echinochloa spp.*
  - Summer grass, *Digitaria spp.*
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## Key Points

- Forming beds well before planting then using a knockdown herbicide and cultivating any emerged weeds is the preferred method
- In beds with low weed populations cultivation can be carried out at time of bed formation to reduce herbicide applications





# Vegetable Industry Development Program

## Actions Around Planting (Transplanting)

Transplanting is the most critical time for obtaining good in-crop weed control. This is when most herbicides available for use in vegetable brassicas are applied. There are currently

six different actives which are registered for application just before or just after transplanting, and before weeds have emerged.

Herbicide	Trade Name	Application Timing	Key Weeds Controlled	Critical Comments
Chlorthal-dimethyl	Dacthal 900 WG	Immediately post transplant	Grasses, nettles, milk thistle, amaranth, pigweed, chickweed, wireweed	Does not control brassica weeds or marshmallow. Requires incorporation by irrigation immediately after transplanting. 8 month plant back for sensitive crops (i.e. lettuce).
Metolochlor S-metolochlor	Dual/Dual Gold Plus and other	Immediately post transplant	Grasses, nettles, milk thistle, nightshade, amaranth, pigweed, chickweed, wireweed	Does not control brassica weeds or marshmallow. Requires incorporation by irrigation within 24 hours after transplanting. Can reduce crop growth in soils with low organic matter or > 60% silt or fine sand.
Oxyfluorfen EC	Goal and others	Pre-plant	Grasses, brassica weeds, nettles, milk thistle, pigweed, chickweed, wireweed	Requires incorporation by irrigation within 7 days of application. Transplanting can break herbicide barrier. 6 month plant back for sensitive crops (i.e. onions).
Oxyfluorfen WP	Baron 400 WP	Immediately post transplant (within 3 days)	Grasses, brassica weeds, nettles, milk thistle, pigweed, chickweed (Suppression), wireweed	Requires incorporation by irrigation within 7 days of application. Can cause crop damage on sandy soils and when applied in cold weather.
Pendimethalin	Stomp and others	Pre-plant	Grasses, fat hen, milk thistle, pigweed, chickweed, wireweed	Requires incorporation by irrigation within 5 days of application. Transplanting can break herbicide barrier. Can cause crop damage when applied in cold weather. 12 month plant back for sensitive crops (i.e. silver beet).
Propachlor	Ramrod	Immediately post transplant	Grasses, nettles, fat hen, milk thistle, amaranth, chickweed, wireweed	Does not control brassica weeds or marshmallow Requires incorporation by irrigation within 24 hours after transplanting.
Trifluralin	Triflur and others	Pre-plant	Grasses, amaranth, pigweed, wireweed	Requires incorporation by irrigation within 6 hours of application. Transplanting can break herbicide barrier.

To effectively control the widest weed spectrum for an extended period a split application of metolochlor OR pendimethalin followed by Baron 400 WP provides the best result. However growers need to evaluate their individual situations with emphasis on environment, weeds present, time of the year, crop rotation, irrigation methods and herbicide cost before making a final decision.



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### Early In-Crop

Options for good control are limited if weeds develop in-crop. Grass weeds can be easily controlled using a number of group A herbicides which are registered in these crops.

These include fluazifop-p-butyl (Fusilade), sethoxydim (Sertin), quizalofop and clethodim (Select). Note these products may not be registered in all crops (check labels for registration rates and withholding periods).

Broadleaf weeds can only be killed by cultivation or by inter-row spraying with a shielded spray unit. There is an optimal time when cultural operations are most effective. If done too early the full benefits of the pre-emergence herbicide will be lost as there is time for further weeds to germinate before the canopy closes over. If done too late crops may just be transplanted and some damage can occur.

The actual timing depends upon the crop, the weeds and the time of the year, however this is generally around 4 weeks following transplanting. In many areas cultivation is also a necessary part of the production process and is needed to ensure good soil aeration and to optimise crop growth.

An alternative option is to control weeds through the use of directed inter-row spraying with non selective herbicides using shielded spraying equipment. This method is effective and very efficient, however it does come with some risk, as any herbicide escape can lead to severe injury or death to the crop. The shielded unit must be well made and maintained to ensure that herbicide does not escape when spraying on uneven surfaces. Currently the only product registered for this use is Gramoxone. Please consult the product label and consult your local agronomist prior to adopting this form of in-crop weed control.

## Key Points

- Grass weeds can be killed using group A herbicides, but options are limited for broadleaf weeds
- Cultivation and inter-row shielded spraying are the only options to control broadleaf weeds prior to canopy





### Late In-Crop and Post-Harvest Weed Control

Once a crop is established and canopy closure achieved it will suppress the growth of most weed species. However species such as Fat Hen, Radish and Potato Weed can grow rapidly and rise above the crop during the last few weeks and interfere with harvest. These weeds can also set seeds and reduce the effectiveness of your integrated weed control management. It is important to reduce their numbers and subsequent seed set.

Hand weeding is the only way to reduce weed numbers prior to harvest and whilst this may be expensive in the short term, the longer term benefits of reducing the weed seed bank, will be seen in future crops. Following harvest, effective weed clean up and maintenance of a clean fallow between crops is essential.

The use of cultivation or non selective herbicide sprays, or a combination of both will ensure clean fields and easier and more cost effective weed management in future crops.

### Key Points

- It is important to control weeds prior to harvest to reduce the opportunity for weeds to set viable seed.
- Hand weeding is an expensive option but will reduce the subsequent seed banks and costs in the long term.

Crop Stage	Fallow	Pre-transplant	Transplanting	In-crop	Post-harvest
<ul style="list-style-type: none"> <li>• Weed control options</li> </ul>	<ul style="list-style-type: none"> <li>• Green manure crop</li> <li>• Knockdown herbicides</li> <li>• Cultivation</li> </ul>	<ul style="list-style-type: none"> <li>• Cultivation</li> <li>• Bed forming</li> <li>• Knockdown herbicides</li> <li>• Some pre-emergence incorporated herbicides</li> </ul>	<ul style="list-style-type: none"> <li>• Post transplant pre-emergence herbicides</li> </ul>	<ul style="list-style-type: none"> <li>• Cultivation</li> <li>• Inter-row spraying</li> <li>• Hand weeding</li> </ul>	<ul style="list-style-type: none"> <li>• General knockdown herbicides</li> <li>• Cultivation</li> </ul>

### References

Dal Santo, P and Velthuis, R, (2007), "A scoping study to review the current herbicides available for weed control in brassica crops and possible future strategies" (Project VG06107) Final report conducted for Horticulture Australia Ltd

Henderson, C (2008) "Managing weeds in broccoli, cauliflower and cabbage", Department of Primary Industries and Fisheries, Queensland. <http://www2.dpi.qld.gov.au/horticulture/4743.html>, Updated 17 March 2008, Accessed 26-MAY-2011



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# Why Cleaning Spray Tanks Is Important?

- Crop protection products and associated adjuvants can leave sticky oily residues on all internal surfaces of spray equipment.
- Small amounts of herbicide residue if not properly removed can cause serious damage to sensitive crops.
- Small amounts of fungicide or insecticide residue can activate some herbicides causing greater levels of crop damage than would be expected.
- Small amounts of residue from some actives could lead to MRL's being exceeded.
- Pesticide residues can cause corrosion of sprayer parts and rubber seals reducing the effective life of the sprayer and increasing the likelihood of blowouts.

## What to Clean With

- All pesticide labels list the appropriate agent to use to effectively remove residues of that active from internal sprayer parts.
- **READ THE LABEL** and use the correct boom cleaner.



## How to Clean

- Always wear protective clothing when cleaning spray equipment, as recommended on the product label.
- Fill the tank with clean water and the recommended tank cleaner.
- Operate the pump and flush the cleaning solution through all hoses, strainers, screens, nozzles and the boom.
- Remove nozzles, screens and strainers and clean them separately in a bucket containing the recommended cleaner.
- Rinse the system with clean water.

## Disposal

- Dispose of rinseate onto bare soil or into collection pits away from streams and water ways.



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