



2022

WEED & PEST CONTROL GUIDE

SUNSHINE SUGAR AG SERVICES

Always read and check the label for full details of use

Prices are a guide only and can be used to compare likely costs of treatment options.

To view the full list of registered products for use in sugarcane in NSW refer to the Australian Pesticides & Veterinary Medicines Authority (APVMA), www.apvma.gov.au

KNOCKDOWN HERBICIDES – GRASS AND BROADLEAF WEEDS

Situation	Herbicide	Rate per ha	Cost (\$/ha)	Comments
Plant cane: up to 3 leaf stage Ratoon cane: less than 10 cm high <i>Small grass (not stooling) & broadleaf weeds</i>	Paraquat + Diuron 900 + 2,4-D	1.2 - 1.6L 0.50kg 1L	\$33	- Boom spray over the top is OK - Add 1.0 L/ha 2,4-D amine if broadleaves present. - This tank mix can be used all year round with NO restriction periods - Paraquat rates are based on a 250g/L product.
Larger Plant & Ratoon cane <i>Small grass (not stooling) & broadleaf weeds</i>	Paraquat + Diuron 900 + 2,4-D	1.6L 0.50kg 1L	\$37	- Apply as a directed spray with Irvin legs. - Add 1.0 L/ha 2,4-D amine if broadleaves present - Advanced weeds – Substitute Bobcat Combi at 0.9kg/ha for Diuron
Cane: all stages <i>Advanced grass growth</i>	Daconate 720 + Diuron 900	4.0 L 1.1 kg	\$79	- Apply as a directed spray under leaf canopy, before grass flowers to salvage cane from advanced grass growth. Contact with leaves will cause some crop damage. - Best results when applied in hot, dry conditions with temp above 25°C. - Reduce the rate of Diuron to 0.5 kg/ha in NSW between 1 November and 30 April
Cane: all stages <i>Advanced grass growth</i>	Asulox® / Rattler®400 (Asulam)	8.5 L	\$165	- Safe to apply over cane. Add wetter, not spraying oils to reduce crop damage. - Apply when weeds are actively growing before they exceed 250mm in height. - Add 2,4-D or Starane if broadleaves present. - Best results when humidity is high (above 80%) for and temp above 17°C.

KNOCKDOWN HERBICIDES – BROADLEAF WEEDS

Situation	Herbicide	Rate per ha	Cost (\$/ha)	Comments
General broadleaf control	2,4-D amine + Atrazine	1.1 – 3.5 L 1 – 2 kg	\$30 - \$54	- Boom spray, use wetter. - Use higher rates for larger weeds - Label requirement is that only nozzles that produce a Very coarse to Extremely coarse droplet, be used with 2,4-D.
Hard to kill Broadleaf weeds (to control species such as: blackberry nightshade, blue top, gooseberry, sida)	Starane™ Advanced (Fluroxypyr) + 2,4-D	0.8 L + 1.5 L	\$48	- Apply from 3 leaf stage to flowering - Apply in 100 - 400L water/ha. - Add Uptake Spraying Oil at 500mL/100L of spray mixture
	Atrazine + 2,4-D	1kg + 1.2 L	\$30	- Apply from 3 leaf stage to flowering - Apply in 100 - 400L water/ha. - Add wetter at 100mL/100L - Use (VC) to (XC) nozzles

Any product containing 2,4-D must be applied using nozzles with a spray quality of Very Coarse (VC) or Extremely Coarse (XC)

PRE-EMERGENT HERBICIDES

Information on herbicide properties is included in this guide. This helps with understanding how a product works and ways to maximise the effectiveness.

Herbicide properties:

Solubility – An indicator of how much rain is needed for incorporation

Volatility – Indicates if the herbicide can transition to the gaseous phase if left on the soil surface without incorporation

Photodegradation – Indicates if the herbicide breaks down in the presence of sunlight i.e. UV stability

Binding – A measure of how tightly the herbicide is bound to the soil particles & organic matter and how mobile the herbicide will be in the soil.

Situation	Herbicide	Rate per ha	Cost (\$/ha)	Comments
PLANT CANE Annual grasses & broadleaves	Atrazine + Diuron	2 kg 1 kg	\$51	- Low cost option for short-term grass and weed control in plant cane - Apply over 3 – 4 leaf plant cane with Paraquat and 2,4-D to knock down grass & weeds and provide residual control. - Atrazine & Diuron have low solubility so adequate (>10mm) rainfall is needed to move the herbicide into the soil. - Losses from volatilisation are low except where the soil stays dry for weeks after application and in this situation photodegradation can increase losses. - Reduce the rate of Diuron to 0.5 kg/ha in NSW between 1 November and 30 April
PLANT CANE Annual grasses & broadleaves	Dual Gold (<i>S-Metalachlor</i>) + Atrazine	1.4 L + 2 kg	\$58	- Dual Gold provides residual control of grasses & some broadleaves – Atrazine extends the broadleaf spectrum - Add Paraquat and 2,4-D if grasses & broadleaves present - Moderately soluble so requires rainfall (>10mm) for incorporation - Photodegradation and volatilisation losses can be high if no rainfall received in 10 days - Can incorporate mechanically if rain unlikely after 10 days - Safe to use over cane, can be applied just after planting or to extend the control period wait until the weeds emerge and apply with paraquat at the 3-4 leaf stage. - Refer to Label for rates for other metolachlor formulations (i.e. Clincher or Bouncer)
PLANT CANE & RATOONS Annual grasses & broadleaves	Dual Gold (<i>S-metalachlor</i>) + Mentor (<i>Metribuzin</i>)	1.4 L + 1.1 kg	\$77	- Dual Gold provides residual control of grasses & some broadleaves –Metribuzin extends the broadleaf spectrum - Add Paraquat and 2,4-D if grasses & broadleaves present - Moderately soluble so requires rainfall (>10mm) for incorporation - Photodegradation and volatilisation losses can be high if no rainfall received in 10 days - Safe to use over cane, can be applied just after planting or to extend the control period wait until the weeds emerge and apply with paraquat at the 3-4 leaf stage.

PRE-EMERGENT HERBICIDES

Situation	Herbicide	Rate per ha	Cost (\$/ha)	Comments
Plant cane: up to 3-4 leaf stage Ratoons: up to 2 leaf stage Grasses & some broadleaves	Balance Flow 480 g/litre <i>(Isoxaflutole)</i>	150 – 300ml	\$16 - \$32	12 weeks control - Add Paraquat if cane emerged at time of spraying or if weeds present - Requires 60mm cover on plant cane, do not apply at full rate on light or sandy soils - UV stable, needs rain to activate - Moderately mobile in soil, heavy rainfall can result in movement down the profile with potential effects on the crop in lighter soils. - Controls paspalum and blue top, poor on setaria
Plant cane & ratoons <i>Grasses & broadleaves</i>	Mentor + Balance Flow	1.1kg 150 ml	\$67	6 – 8 weeks control - Add Paraquat if cane emerged at time of spraying or if weeds present - Balance is UV stable, metribuzin is effective with minimum rainfall within 7 days. - Use 1.6 kg metribuzin if vines a problem
Plant cane & ratoons <i>Grasses & broadleaves</i>	Flame® <i>(Imazapic)</i>	300 - 400mL	\$15	12+ weeks control. - Add Paraquat if cane emerged at time of spraying or if grasses & broadleaves present when spraying - UV stable and non-volatile so little breakdown on the soil surface after application. Activated after rain. - Highly soluble and only moderate binding to soils allows imazapic to be readily washed off trash and incorporated with rainfall. - Effective against paspalum and wild sorghum; poor against crowfoot grass and thickhead. - For crowfoot grass control, add 2 kg/ha Atrazine - Provides good suppression of nut grass - Do not apply more than once per year - Care needed in wet years with the application rate to reduce crop damage.
Plant cane & ratoons <i>Grasses & broadleaves</i>	Bobcat®i-MAXX SG <i>(Imazapic + Hexazinone)</i>	550 g/ha	\$67	- Grass + broadleaf control - The two component products are UV stable and non-volatile so little breakdown on the soil surface after application. Activated after rain. - Soluble and moderate mobility in the soil for both components means Bobcat i-MAXX can be readily washed off trash and incorporated with rainfall. - Use after fill-in in plant cane and at all stages in ratoon cane - Add 1.6L/ha Paraquat if cane emerged at time of spraying or if weeds present

PRE-EMERGENT HERBICIDES

Situation	Herbicide	Rate per ha	Cost (\$/ha)	Comments
Ratoon Cane: straight after harvest <i>Broadleaves, grasses, and sedges</i>	Balance Flow + Flame/Spark /Impose	150 ml + 250-300 ml	\$27	- Provides control of broadleaves, and most grass species - UV stable and activated by minimum rainfall - Use Boom spray over the top before cane has emerged, or add Paraquat if cane has emerged. - Use as a directed spray with Irvin legs for later applications.
Plant Cane & Ratoons: straight after harvest <i>Broadleaves, grasses, and sedges</i>	AmiTron (Amicarbazone) + Balance Flow	0.8 kg 150 ml	\$72	- Provides control of broadleaves, vines & residual control of most grass species - UV stable and activated by minimum rainfall - Use Boom spray over the top before cane has emerged, or add Paraquat if cane has emerged. - Use as a directed spray with Irvin legs for later applications. DO NOT use on SANDY soils (>90% sand)
Ratoon & Plant Cane Out of hand Stage <i>Broadleaves, vines, grasses, and sedges</i>	AmiTtron + Balance + Basta	0.8 kg 150 ml 1 – 3L	\$96 - \$145	- Provides control of broadleaves, vines & residual control of most grass species - UV stable and activated by minimum rainfall - Apply as a directed spray DO NOT use on SANDY soils (>90% sand)
Ratoons only <i>Grasses & broadleaves</i>	/ Bobcat Combi (Hexazinone + Diuron)	3kg	\$91	8 – 12 weeks control of grasses and broadleaves. - Add Paraquat and 2,4-D if grasses & broadleaves present when spraying - Hexazinone is UV stable, diuron is not. - Best results when incorporated by rain into bare soil within 10-14 days. - Use directed spray with Irvin legs. Do not apply in NSW between 1 Nov - 31 March

SPOT SPRAY MIXTURES

Situation	Herbicide	Rate per 100L water	Cost per 100L of spray mixture	Comments
Wild sorghum/green panic/guinea grass/paspalum/setaria & general broadleaf weeds	Glyphosate	1L	\$15	- Spray so there is good coverage on the plants - Weeds should be actively growing
	Paraquat + Diuron + 2,4-D + Wetter	160 ml 400 grams + 100 ml + 100 ml	\$12	- Wet thoroughly to the point of runoff - Apply around 1L of spray mixture per stool depending on size.
	Daconate 720® + Diuron 900	1.1 L 0.5kg	\$27	- Use sufficient spray volume to thoroughly wet weeds - Best results in hot dry conditions with temperature above 25°C
	Asulox® / Rattler®400	2L	\$40	Needs temp above 17°C and humidity above 80% for best results

INTER-ROW WEED MANAGEMENT

Situation	Herbicide	Rate per ha	Cost (\$/ha)	Comments
Inter-row spraying with a hooded or shielded sprayer <i>Annual & perennial grasses and broadleaf weeds</i>	Roundup Ultra® Max Weedmaster® Argo® <i>(Glyphosate)</i>	1.1 – 4.7L	\$17 - \$71	- Only the Glyphosate potassium salts are registered for in-crop use through shields or hoods - Apply at early growth stage of crop - Do not allow spray or spray drift to contact any part of the crop as severe injury may result - Maximum of 3 applications to a maximum of 11.4L per crop - Addition of Terrain or Valor (500g/kg Flumioxazin) at 30g/ha will improve speed of brown out and may improve final control of broadleaf weeds & vines.
Grasses and broadleaf weeds Directed Application	Basta <i>(Glufosinate-ammonium)</i>	1L – 3L	\$24 - \$73	- Direct spray beneath leaves - Use coarse droplet nozzles - Avoid contact on non-target plants - Toxic to aquatic life, do not spray near drains. - Humidity > 50%

NUT GRASS CONTROL			
Herbicide	Rate per ha	Cost (\$/ha)	Comments
Sempre® (Halosulfuron-methyl)	65 -130g	\$29- \$57	- Use higher rate for heavy infestations - Apply only to actively growing nut grass - Add non-ionic wetter at 200mL/100L - Nufarm trial work has shown excellent nutgrass control using 65g Sempra + Bonza spray adjuvant at 500mL/100L - Use directed spray if possible.
“Double knock” 2,4-D Followed by Sempra	1.5 l/ha 130 g/ha	 \$72	- NSW research has shown that “double knock” treatments are very effective in controlling nutgrass and below ground tubers (nuts) - Apply 2,4D (1.5L/ha) initially then 2 to 4 weeks later or when remaining nut grass is actively growing apply Sempra
Flame®	400mL	\$15	- Gives good suppression if applied as a pre-emergent - Do not apply more than once per year

FALLOW MANAGEMENT			
Herbicide	Rate per ha	Cost (\$/ha)	Comments
Roundup Ultra® Max (570g/L Glyphosate)	3.8 – 5.7L/ha	\$57- \$86	- Cane control in fallow - Apply under good growing conditions only to actively growing ratoons 60-120 cm tall. - DO NOT apply if plants are under stress from low moisture or waterlogging. - Use rates up to 3.0L/ha for follow up cane control and for annual and perennial weeds - Addition of Terrain or Valor (500g/kg Flumioxazin) at 30g/ha will improve speed of brown out and may improve final control of broadleaf weeds & vines.
Weedmaster® DST® (470g/L Glyphosate)	4.6 – 6.9L/ha	\$51 - \$76	
Sprayseed® 250 + 2,4-D amine	1.6 – 3.2L/ha + 1L/ha	\$36 - \$61	Broad spectrum control of annual grasses, vines, broadleaf weeds in Fallow
Verdict™ 520 (Haloxyp)op)	150mL/ha	\$8	- Controls cane volunteers and grasses in soybean crops - Use with Uptake spraying oil at 0.5L/100L of spray solution

FUNGICIDES

PINEAPPLE DISEASE CONTROL & SMUT (SINKER® ONLY)

Product options	Rate per 100L of water	Cost per 100L of water	Comments
Bumper® 625	8 mL	\$3	- Ensure thorough coverage of cut ends of setts - Check label rate for different formulations Assume 500 litres water/ha
Tilt® 250EC	20 mL	Or	
Throttle®500 (Propiconazole)	10 mL	\$15/ha	
Sinker® (Flutriafol)	50mL Or 500ml/ha	\$5 \$49/ha	- For the prevention of primary infection of sugarcane smut and pineapple disease in plant material - Add wetting agent to enhance coverage of planting setts - Assume 500 litres water/ha

INSECTICIDES

SUGARCANE WIREWORM CONTROL

Product options	Rate per ha	Cost (\$/ha)	Comments
Lorsban™ 500EC (Chlorpyrifos)	1.5L	\$21	Apply as a low pressure or gravity feed spray on to the plant sett adjacent to the soil at the point of exit from the planter prior to the soil covering the sett.
Regent®/ Maestro®/ Vista 200SC (Fipronil)	100mL	\$8.36	Apply in the furrow over the top of setts in sufficient water to ensure good coverage of setts and surrounding soil.
Talstar® 250EC or Astral® 250EC (Bifenthrin)	150mL	\$6	Apply as a spray into the furrow at planting. Use a spray nozzle which will deliver a coarse spray in a total volume of 60 – 100 L/ha in a band 20 - 30 cm wide over the base of the furrow on top of the setts and before covering soil is brought in by tines.

ARMYWORM CONTROL

Product options	Rate per ha	Cost (\$/ha)	Comments
Lorsban™ 500EC (Chlorpyrifos)	1.5 L	\$21	Most damage is caused by night feeding armyworms. Spray in early evening. This targets the armyworms as they move up to feed and prevents sunlight degradation of Lorsban
Axe (Permethrin)	100 – 200mL	\$7 - \$14	Use a higher rate if larvae larger than 10mm are present

SOYBEAN WEED CONTROL

Crop Stage	Herbicide	Rate per ha	Cost (\$/ha)	Comments
Pre-emergence	Dual Gold + Broadstrike/ Broadsword (Flumetsulam)	1 - 2 L + 25g	\$28 - \$47	• Apply immediately after planting before weeds germinate • Require >10mm rain to incorporate for optimal efficacy • If weeds present at time of planting, add Glyphosate 450g/l @ 1L/ha
Early Post-emergence	Spinnaker (Imazethapyr) + Non-ionic Surfactant	140g + 200mL/100L	\$23	• Apply to actively growing weeds in the 2 to 4 leaf stage • All weeds may not be controlled but will be suppressed. • Grass weeds will require a follow-up spray with selective grass herbicide (see below)
Post-emergence	Verdict™ 520 (Haloxypfop)	150mL/ha	\$8	• Controls cane volunteers and grasses in soybean crops • Use with Uptake spraying oil at 0.5L/100L of spray solution •
Post-emergence	Fusilade Forte 128EC (Fluazifop)	0.82 – 1.65L/ha	\$59 - \$119	• Controls cane volunteers and grasses in soybean crops • Use lower rate for grass weeds at the 3-5 leaf stage before tillering commences • Apply in not less than 100 L/ha. Use higher water volumes if weeds are dense.
Post-emergence Bean weed (Sesbania)	Blazer (Acifluorfen)	2L/ha	\$101	• Only option for bean weed control, expensive but does the job very effectively • Add Activator at 100mL/100L
Post-emergence (Cobblers peg/ farmers friend)	Basagran®/ Broadstar® (Bentazone)	1.5 – 2L/ha	\$36-72	• Apply to weeds up to 4-leaf stage
Pre-harvest (Dessicant)	Reglone (Diquat)	2 – 3 L	\$40	• Spray when 80% of pods are yellow / brown • Seeds – yellow & pliable • Harvest 4 – 7 days after spraying •
Pre-harvest (Dessicant)	Glyphosate	0.7 – 2.0 L	\$11 - \$30	• Spray after pods have lost all green colour & 80 % of leaves have dropped • Do Not Harvest within 7 days of application

TANK MIXING GUIDE

STEP	What to do	Example Products
1	Fill the spray tank to at least 70% full. Commence agitation	
2	Add water conditioners	Liase or LI700
3	Add Water Dispersible Granule (WDG) products	Granular products such as: Atradex, Diurex, Ametrex®800WG, Barrage
4	If you have added any WDG products – Allow up to 10 minutes for complete dispersion	
5	Add Flowable Liquids (FL) or Suspension Concentrate (SC) products	Liquid flowable Diuron, Atrazine
6	Add Emulsifiable Concentrate (EC) products	Trifluralin (Treflan, TriflurX), Pendimethalin (Stomp® Xtra , Rifle 440)
7	Add Soluble Liquid (SL) products	Paraquat (Gramoxone, Nuquat etc.), 2,4-D products (Amicide)
8	Fill the spray tank to nearly full	
9	Add any Glyphosate based products	Roundup, Roundup Ultramax, Weedmaster etc.
10	Add Wetting agents or Adjuvants and fill tank	Activator, Shirwet

Source: *Nufarm Multiple Tank Mix Solutions Guide*.

Always check the compatibility statement on the label before tank mixing multiple products.

NOTES:

- Prices are a guide only and can be used to compare the likely cost of treatment options.
- Cost per hectare is calculated using list prices as at September 2022
- Costs per hectare within the Pre-Emergent guide do not include costs for Paraquat or 2,4-D
- Maximum application of Atrazine must not exceed 3.3 kg /ha per year
- New label conditions exist for products containing Diuron. Maximum use rate is now 1.9kg of a 900g/kg product. Check latest regulations at www.apvma.gov.au

Reference:

Congreve M. and Cameron J. (eds) (2014). Soil behaviour of pre-emergent herbicides in Australian farming systems - reference manual for advisers. GRDC publication, Australia

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