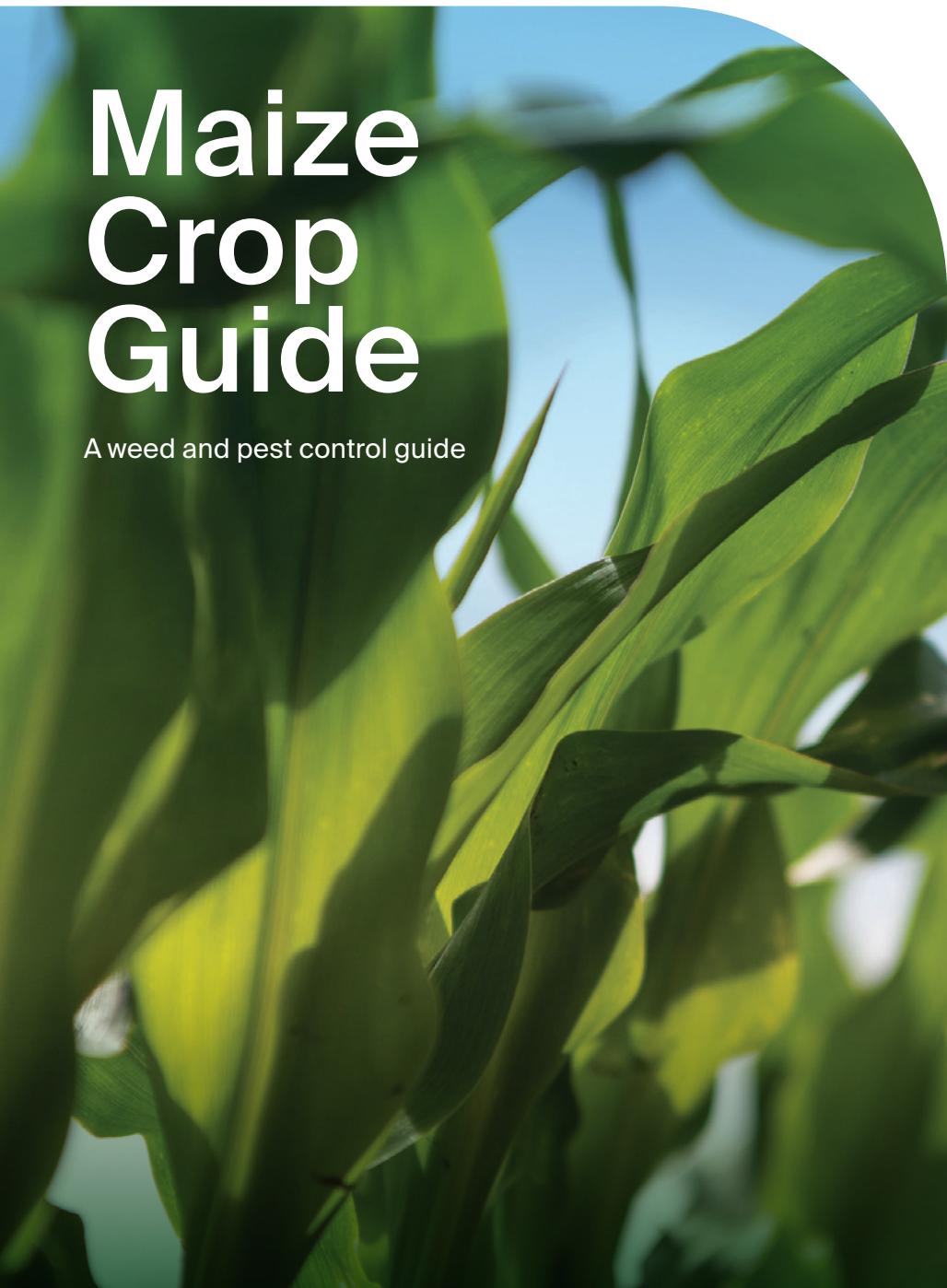


Maize Crop Guide

A weed and pest control guide



Simple steps to produce an effective maize crop



Successful maize production

So you've invested in top quality treated seed and you are determined to give your maize crop every chance of being a winner.

Most likely to stand between you and success (apart from the weather) are weeds and pests. Hybrid maize varieties, while endowed with very high yield potential, are inherently poor competitors with weeds or pests.

Good weed and pest control is essential in maize.

Good weed control eliminates competition for light, nutrients and moisture for best growth conditions. It also protects the palatability and nutritional potential of your crop. Eliminating pests like slugs, armyworm and cutworm will ensure maximum plant establishment.

Plan early

Start early where perennial weeds are a problem.

In autumn, select the paddock early and control hard-to-kill perennial weeds (especially browntop, couch, Californian thistles, Mercer grass, paspalum, kikuyu etc) with CRUCIAL®. Spray in autumn to maximise CRUCIAL's translocation and effectiveness, then sow a short-term crop (ryegrass or cereal) for some high quality grazing or silage.



A pre-plant clean-up saves time

Before establishing the crop, spray with CRUCIAL to kill the existing vegetation. This clean-up provides the following benefits:

- Controls perennial weeds to minimise competition in the maize crop.
- Reduces the tillage required to produce an excellent seedbed, saving time and money, because plant root breakdown has already been achieved by CRUCIAL.
- Keeps the paddock in production longer beforehand, because an extensive cultivation or fallow period is not required for the new crop.
- Weather is less likely to delay planting, since you are not relying on so many suitable days for cultivation.

CRUCIAL application rates

Application rates for CRUCIAL		Pulse® Penetrant rates
Annual ryegrass, cereals	1.8–2.4L / ha	100ml/100L water
Browntop, kikuyu, Mercer grass	3.6L / ha	100ml/100L water
Couch, paspalum	1.8–3.6L / ha	100ml/100L water
Perennial ryegrass, Californian thistles	2.4L / ha	100ml/100L water
Red fescue, docks	5.4L / ha	100ml/100L water

Note: Many old pastures contain hard-to-kill weeds and will need at least 3.6L/ha CRUCIAL.

Tips to maximise CRUCIAL's performance

For maximum absorption, you need at least 5–10cm of actively growing leaf (minimum 10–15 cm if couch is present). Spray first then wait 1 day for annual species and 3 days for perennial species before grazing.

Add Pulse Penetrant at 100ml/100L water to:

- Improve CRUCIAL adhesion, penetration and uptake
- Ensure control of perennial ryegrass
- Aid rainfastness of CRUCIAL – 15 minutes* vs. 2 hours without Pulse Penetrant.

Hard-to-kill weeds

If necessary, add companion herbicides to control weeds that are not well controlled by CRUCIAL and Pulse Penetrant alone.



Nail® 600EC

Add Nail 600EC to improve speed of brownout, and assist control of weeds such as mallows, nettles and polygonum species. Use at 20–40ml/ha.



Archer® 750

Add Archer 750 to improve control of weeds such as clover, thistles, plantain and yarrow. Use at 200–400ml/ha.



Sero® 750WG

Add Sero 750WG to improve control of weeds such as clover, sheep's sorrel and yarrow. Use at 40g/ha.



Kamba® 750

Add Kamba 750 to improve control of weeds such as dandelion, docks and willow weed. Use at 400ml/ha.



Charter™ 750WDG

Add Charter 750WDG to aid control of weeds such as buttercup and large docks. Use at 20g/ha.

Observe the relevant plant-back intervals and grazing withholding periods for the above herbicides for maize. For further advice where these are not known, please contact your local Nufarm Business Development Manager.

Controlling pests pre-planting



Slugs

Slugs feed on seeds and germinating or emerged seedlings, reducing establishment. They are a major problem in strip-till and no-till situations, therefore SlugOut® should be applied as a necessity to minimise damage.



SlugOut

Active ingredient: 18g/kg metaldehyde

SlugOut's unique dust-free granules give excellent coverage per square metre, ensuring effective control of crop-destroying slugs. Broadcast at 10–15kg/ha either in a single application or in a split application, apply half (5–7.5kg/ha) around a week prior to planting, the other half at planting.

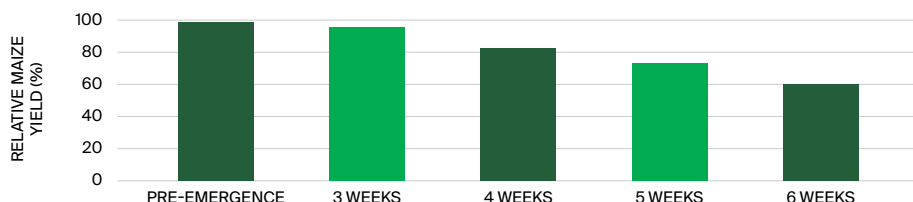
Pre-emergence weed control

Controlling weeds early with a pre-emergence herbicide is **CRUCIAL** in maximising maize yields. FAR trials show that waiting to control weeds until as little as 4 weeks after emergence can reduce maize yields by at least 10–20%.

Other risks of relying solely on a post-emergence herbicide include:

- Delay in application of post-emergence herbicides due to weather may result in even further yield losses.
- Larger weeds are typically more difficult to control.
- Post-emergence herbicides may only control certain weeds or control only broadleaf weeds and not grass weeds or vice versa.

Effect of post-emergence herbicide timing on maize yield losses due to weed competition



(Source: Foundation for Arable Research, Maize Arable Update, No.17)



Roustabout® 840

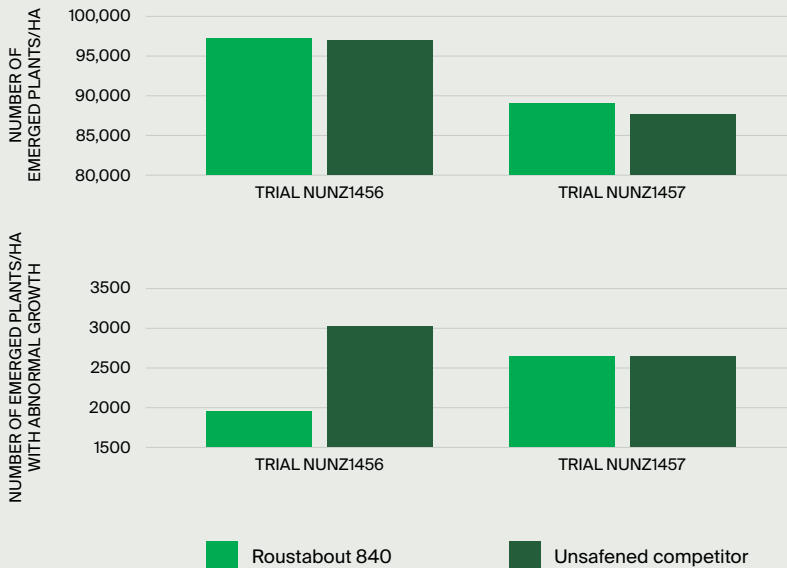
Active ingredient: 840g/L acetochlor

Controls a broad spectrum of annual grasses and broadleaf weeds before they emerge and compete in the crop, by applying Roustabout 840 to the bare soil. Roustabout 840 is a high strength acetochlor formulation which is applied soon after planting, prior to crop and weed emergence. For best results apply Roustabout 840 within seven days of last cultivation.

Roustabout 840 is effective in a wide range of soils and climates and provides up to 10 weeks pre-emergence weed control. Roustabout 840 doesn't rely on incorporation, although incorporation may be beneficial in dry conditions.

Roustabout 840 contains a safener to minimise damage to the maize during emergence, especially when conditions are less than desirable. This maximises the number of healthy maize plants that establish and grow to maturity.

Impact of using Roustabout 840 compared with an unsafened competitor



Trial NUNZ1456: Planted 25 Sept 2014 – Pioneer P0791

Trial NUNZ1457: Planted 26 Sept 2014 – Pioneer P0891

Broadleaf weed control



Nu-Trazine™ 900DF

Active ingredient: 900g/kg atrazine

If a high infestation of broadleaf weeds (especially willow weed or fathen*) is expected, tank-mix Nu-Trazine 900DF with Roustabout 840. Nu-Trazine 900DF offers the following benefits:

- Highly effective for pre or post-emergence broadleaf weed control.
- High strength granular formulation of atrazine, so there's less to handle and it's safer to use.
- More compatible with other herbicides.

The ability to tank-mix Nu-Trazine 900DF with Roustabout 840 or Primera® 480SC offers the flexibility to vary the rate of either herbicide according to conditions, which is not possible with ready-mixed products.



Flowable Atrazine 500

Active ingredient: 500g/L atrazine

Flowable Atrazine 500 is a highly effective herbicide for pre or post-emergence broadleaf weed control. Weeds controlled include fathen*, black nightshade, willow weed, amaranthus spp. and apple of Peru. Flowable Atrazine 500 should be tank-mixed with Roustabout 840 or Primera 480SC.



Primera 480SC

Active ingredient: 480g/L mesotrione

Primera 480SC is an effective herbicide for pre or post-emergence weed control in maize (not recommended for use in sweetcorn and popcorn). Weeds controlled include black nightshade, fathen, mallow, redroot, willow weed and wireweed. Primera 480SC also has activity on some grasses, particularly summer grass. To increase the spectrum of weed activity use in combination with 2L/ha of Flowable Atrazine 500 or 1.1kg/ha Nu-Trazine 900DF.

**Excludes triazine-resistant fathen.*

Pre-emergence weed control

Application rates

Herbicide	Weeds	Application rate	Application timing
Roustabout 840	Annual grasses and broadleaf weeds	3L/ha, 2.5L/ha for light, sandy soils only	Apply to bare soil after planting and before weed emergence
Nu-Trazine 900DF	Broadleaf weeds including fathen, black nightshade, willow weed, amaranthus and apple of Peru	0.8–1.6kg/ha	Apply in tank mix with either Roustabout 840 or Primiera 480SC
Flowable Atrazine 500	Broadleaf weeds including fathen, black nightshade, willow weed, amaranthus and apple of Peru	1.5–3.0L/ha	Apply in tank mix with either Roustabout 840 or Primiera 480SC
Primiera 480SC	Black nightshade, fathen, mallow, redroot, willow weed, wireweed and summer grass	350–450ml/ha	Apply immediately after planting and before weed emergence



Post-emergence weed control

Trials show pre-emergence weed control in maize out-yields post-emergence weed control, due to the removal of weed competition before it starts. Therefore, pre-emergence weed control should remain the foundation of a successful maize weed control programme. However, post-emergence herbicides may also be required in a range of situations, and it is important that they are chosen wisely. The weeds present will dictate which post-emergence herbicides are the most suitable.

Broadleaf weed control



Kamba 750

Active ingredient: 750g/L dicamba

Kamba 750 is a unique high strength dicamba formulation which controls broadleaf weeds.



Primera 480SC

Active ingredient: 480g/L mesotrione

Primera 480SC is an easy to use, selective herbicide for weed control in maize with a flexible application period. Can be tank-mixed with Nu-Trazine 900DF or Flowable Atrazine 500 to increase the broadleaf weed spectrum. Tank-mix with Latro® WG if grass weeds are present.





Archer 750

Active ingredient: 750g/L clopyralid

Targets Californian thistles, other thistles, yarrow, Bathurst bur and volunteer potatoes.



Valdo® 800WG

Active ingredient: 800g/kg flumetsulam

Targets buttercups, mallow, mayweed or spurrey. Can be tank-mixed with Latro WG where grass weeds are also a problem.

Grass weed control



Latro® WG

Active ingredient: 750g/kg nicosulfuron

Latro WG is a water dispersible granule that is ideal for post-emergence control where annual and perennial grasses are the main target. Latro WG also controls or suppresses a wide range of broadleaf weeds and annual grasses with an easy to measure and mix granular formulation.

Nutsedge (Nutgrass) control



Sempra®

Active ingredient: 750g/kg halosulfuron-methyl

Sempra is a water dispersible granule that is ideal for post-emergence control of purple and yellow nutsedge. It is the only available registered product to control purple and yellow nutsedges in maize. Can also be tank-mixed with Kamba 750 or Primera 480SC for general broadleaf weed control.

Post-emergence weed control

Application rates

Herbicide	Weeds	Application rate	Application timing
Kamba 750	Broadleaf weeds like Californian thistles, bindweed, fathen and docks	270–400ml/ha	Apply to seedling weeds at 3–5 leaf stage, or rosettes less than 5cm diameter
Primiera 480SC	Broadleaf weeds and annual grasses	150–200ml/ha with Bonza® Gold at 500ml–1L/100L water. To improve activity use in combination with 1–1.5 L/ha of Flowable Atrazine 500 or 0.4–0.7 kg/ha Nu-Trazine 900DF	Apply to weeds up to the 8 leaf stage
Archer 750	Yarrow, Bathurst bur, Californian thistles, other thistles and volunteer potatoes	200–400ml/ha	Apply after the 3 leaf expanded stage before the crop closure
Valdo 800WG	Buttercups, mallow, mayweed or spurrey	30–65g/ha with Bonza Gold at 500ml/100L water	Apply when the maize is at the 4th leaf (90mm plant height) stage
Latro WG	Annual grass weeds (including yellow bristle grass) and perennial grasses like couch, ryegrass, Mercer grass and Kikuyu. Broadleaf weeds include black nightshade, fathen, redroot, thorn apple, twin cress, water pepper and willow weed	80–110g/ha with Bonza Gold spray at 500ml–1L /100L water	Apply before weeds have reached the 4 true leaf stage
Sempre	Purple and yellow nutsedge	65–130g/ha with either Bonza Gold at 500ml/100L water or Contact™ Xcel at 150ml/100L water	Apply when there is a minimum 10cm of new nutsedge growth prior to canopy closure of the crop

Note: Check label for weeds controlled and correct rate depending on weed species and size.

Post-emergence tank mix options

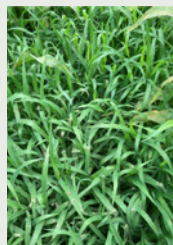
Product combination	Weeds	Notes
Primiera 480SC + Latro WG	Broadleaf, annual grasses, perennial grasses	Outstanding control of hard to kill broadleaf weeds and annual and perennial grasses
Kamba 750 + Latro WG	Both broadleaf and grass weeds	Do not add Bonza Gold spray adjuvant with this tank mixture as there may be an increased risk of crop injury. Reduced grass weed control is likely

Adjuvant selection matters

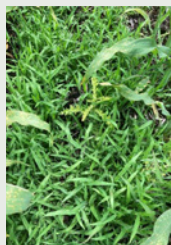
Grass herbicide performance can be significantly influenced by adjuvant choice.

In Nufarm maize trials, Latro WG + Bonza Gold delivered significantly greater summer grass control than competitor adjuvants, particularly at lower rates.

Use Bonza Gold at 500ml-1L/100L water to maximise herbicide uptake, consistency and grass weed control.



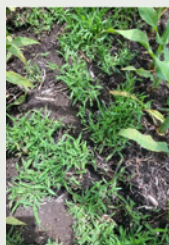
Untreated



Latro WG +
Competitor 0.5%



Latro WG +
Bonza Gold 0.5%



Latro WG +
Competitor 1.0%



Latro WG +
Bonza Gold 1.0%

Post-emergence pest control

Check maize crops regularly (every few days) in the first few weeks after emergence for evidence of pests.



Slugs

Slugs feed on seeds and germinating or emerged seedlings, reducing establishment. They are a major problem in strip-till and no-till situations, therefore SlugOut should be applied as a matter of course.



SlugOut

Active ingredient: 18g/kg metaldehyde

SlugOut's unique dust-free granules give excellent coverage per square metre, ensuring effective control of crop-destroying slugs. Broadcast at 10–15kg/ha either in a single application, or in a split application, half (5–7.5kg/ha) applied around a week prior to planting, the other half at planting.



Greasy cutworm caterpillars

Greasy cutworm caterpillars are blackish-brown to greasy grey-green, growing up to 50mm long. They live in the soil and feed at night, damaging seedlings by eating leaves, cutting stems near ground level or completely defoliating plants.



Kaiso® 50WG

Active ingredient: 50g/kg lambda-cyhalothrin

Kaiso 50WG is a powerful weapon against insects. In the form of unique granules with Sorbie® Technology. Provides easier and safer handling and storage and quick knock-down. Apply Kaiso 50WG at 200g/ha as soon as damage becomes evident.

Other post-emergence pests

Check maize crops regularly (every few days) in the first few weeks after emergence for evidence of pests.



Cosmopolitan armyworm

Armyworms can be identified by a light stripe on the side and a 'Y' shape on the head. They cause serious leaf feeding damage and injury to the ear. Armyworms can damage maize at most growth stages, especially later plantings before silking.



Corn earworm

Corn earworms vary in colour from pink to green or brown, with dark, bristly raised bumps. They damage cobs by feeding on silks during pollination and kernels during grain fill, increasing the risk of fungal infection during drydown.



Fall armyworm

Fall armyworms are identified by an inverted white 'Y' on the head and four dark spots forming a square on the second to last body segment. Larvae range from green to brown with stripes, causing severe leaf damage, whorl burrowing, and yield loss in maize.



Adjuvants

Using the correct adjuvant with your crop protection product can achieve higher efficacy, improved deposition, coverage and penetration. It can also reduce drift, water use and over-spraying or crop damage, resulting in safer more sustainable spraying practices.



Bonza Gold

Active ingredient: 500g/L ethyl esters

Bonza Gold is a blend of esterified canola oil with emulsifiers and surfactants to enhance wetting and spreading of agricultural chemicals, uptake of systemic herbicides and as an aid for modifying spray droplet quality and to preserve droplet survival.



Contact Xcel

Active ingredient: 980g/L linear alcohol ethoxylate

Contact Xcel is non-ionic surfactant specifically formulated to reduce the surface tension of spray droplets, causing them to spread out evenly over sprayed surfaces upon impact. This provides an increase in the number of droplets retained by the target which then merge to form a continuous film, allowing maximum sites for chemical action or uptake.



Flume

Active ingredient:
Proprietary blend of organo silicone and non-ionic adjuvants

Flume is a superior non-penetrating super spreader that improves coverage of horticultural and agricultural products. It reduces surface tension of spray solutions, allowing spray to spread rapidly over plant surfaces. It is used in low water volumes. Flume saves in time, water and spray costs and can be used in aerial applications.



Post-harvest cleanup

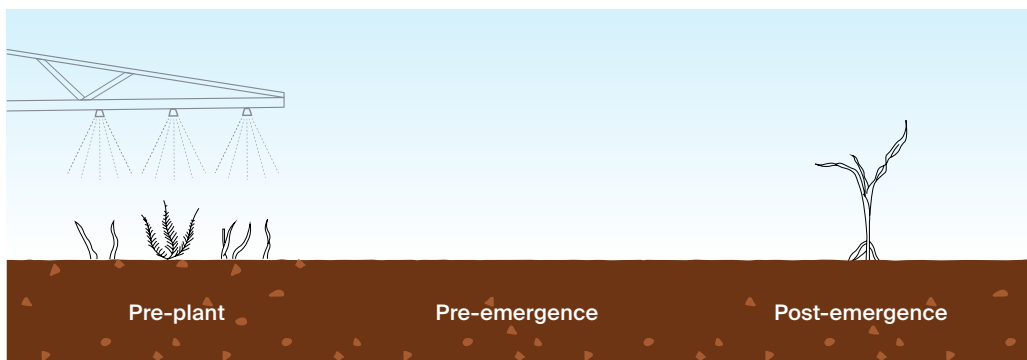
Don't miss the opportunity for a post-harvest cleanup.

Spray with CRUCIAL, particularly if hard to control perennial weeds are present. This is the essential last step before establishing perennial pasture.



Maize crop lifecycle

Pre-plant sprayout		Pre-emergence	
CRUCIAL ADVANCED TECHNOLOGY HERBICIDE	9	Roustaabout 840	15
ARCHER 750 DUAL SALT LIQUID HERBICIDE	4		
NAIL 669	14		
SERO 750WG	2		
Charter 750WDG	2	PRIMERA 480SC	
Kamba 750	4	Nu-Trazine 900DF	
		Alrazine	
		SlugOut	

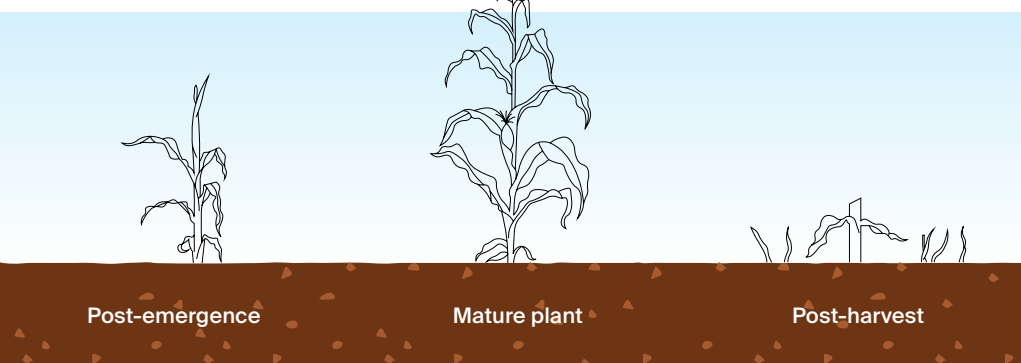


Always consult product label for specific application timing.

Continual use of the same mode of action products can result in resistance development in weed populations. Where possible, it is important to rotate modes of action herbicides.

To aid in this, the modes of action for the herbicides are presented next to the product in green circles. The insecticide modes of action are in the orange circles.

Post-emergence		Post-harvest cleanup	
 ARCHER 750 DUAL SALT LIQUID HERBICIDE	4	 CRUCIAL ADVANCED TECHNOLOGY HERBICIDE	9
*  Kamba 750	4	 ARCHER 750 DUAL SALT LIQUID HERBICIDE	4
**  latro WG	2	 NAIL 662	14
 Semptra	2	 SERO 750WG	2
	27	 Charter 750WDG	2
	5		
	5		
 kaiiso 50WG with SCOUTER TECHNOLOGY	3		



* Do not spray when maize has exceeded 30cm in height.

** Do not overspray and do not apply Latro WG into the maize whorls as crop damage may occur.

Working out what you need

	Application rate per ha	Total ha's required	Amount required
Sprayout			
CRUCIAL	1.8–3.6L/ha		
Nail 600EC	20–40ml/ha		
Kamba 750	400ml/ha		
Charter 750WDG	20g/ha		
Archer 750	200–400ml/ha		
Sero 750WG	40g/ha		
Pulse Penetrant	100ml/100L water		
Pre-emergence			
Roustabout 840	3L/ha		
Nu-Trazine 900DF	0.8–1.6kg/ha		
Flowable Atrazine 500	1.5–3.0L/ha		
Primiera 480SC	350–450ml/ha		



	Application rate per ha	Total ha's required	Amount required
Post-emergence			
Kamba 750	270–400ml/ha		
Primiera 480SC	150–200ml/ha		
Latro WG	80–110g/ha		
Archer 750	200–400ml/ha		
Valdo 800WG	30–65g/ha		
Sempra	65–130g/ha		
Bonza Gold	0.5–1L/100L water		
Contact Xcel	150ml/100L water		
Pest control			
SlugOut	10–15kg/ha		
Kaiso 50WG	200g/ha		
Flume	Refer to label		



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