Weed management tactics for Australian cotton

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Develop a strategy

It is important to strategically plan how different tactics will be utilised to give the best overall results for the existing weed spectrum. A short term approach to weed management may reduce costs for the immediate crop or fallow, but is unlikely to be cost effective over a five or ten year cropping plan. Over this duration, problems with species shift and the development of herbicide resistant weed populations are likely to occur where weed control has not been part of an integrated plan.

Having good records on crop rotations, herbicides and other tactics used as well as weed species present will help to develop a plan that identifies where there are particular risks in the system and also where there might be opportunities to incorporate additional tactics. Deployment of tactics recognises the full range of farming system's inputs that impact on weeds and the interactions of these inputs, as shown diagrammatically in Figure A. The herbicide resistance management strategy (HRMS) can help to inform the effectiveness of combinations of tactics on reducing the weed seed bank as well as the risk of herbicide resistance.

Know your enemy

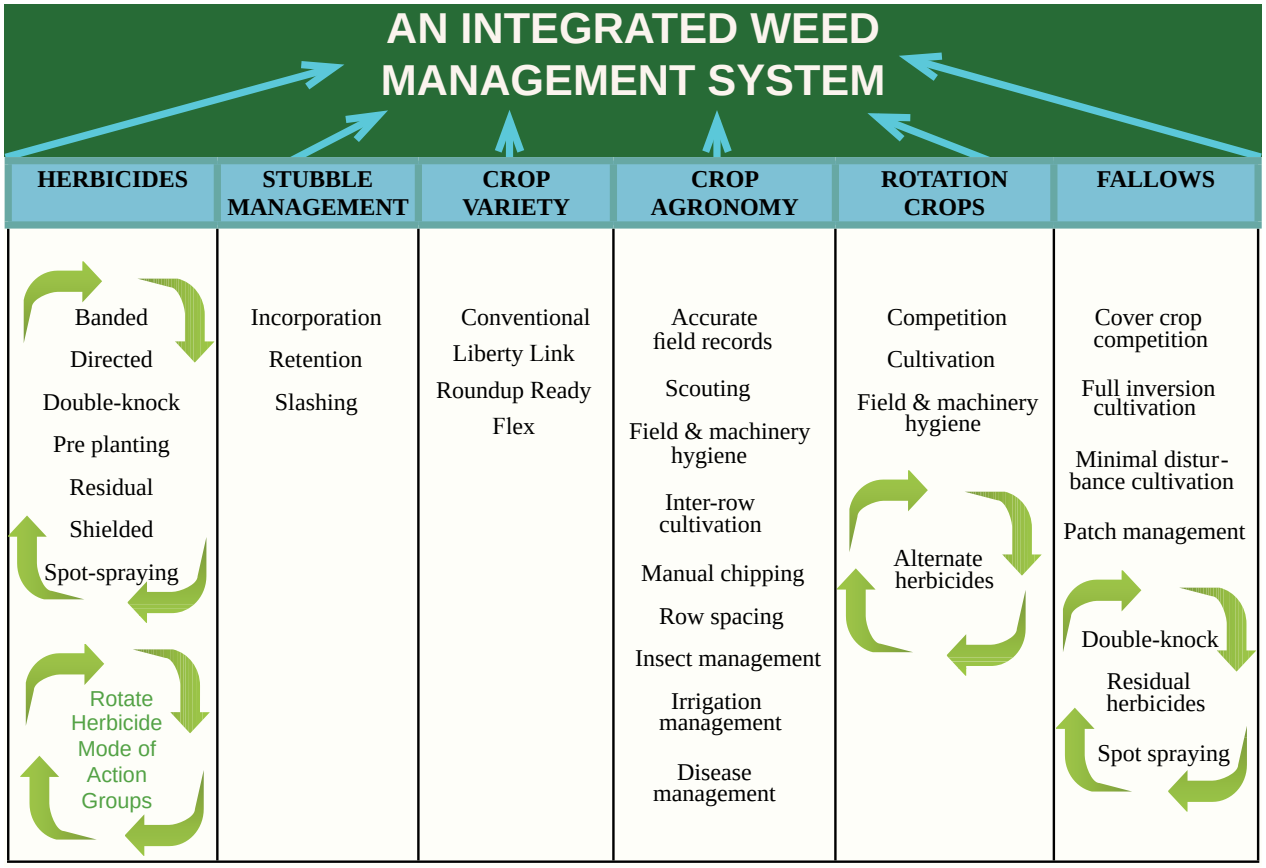
In developing a strategy it is important to consider what weed species are present. Ensure that weeds are correctly identified, and consider which tactics or combination of tactics, are going to be most effective for your weed spectrum. Similar species may respond differently to control measures. For example, the strong seed dormancy mechanisms of cowvine (*Ipomoea lonchophylla*) make it less responsive to a tactic like the spring tickle than bellvine (*Ipomoea plebeia*) which has very little seed dormancy. Herbicide susceptibility can also differ between similar species. The Weed ID guide and Weedpak are key resources that can assist.

It is important to identify particular problem areas. Managing these patches more intensively may help to prevent a problem weed or resistance spreading.

Time your tactics

Often the timeliness of a weed control operation has the largest single impact on its effectiveness. Herbicides are far more effective on rapidly growing small weeds, and may be quite ineffective in controlling large or stressed weeds. Cultivation may be a more cost-effective option to control large or stressed weeds, but additional costs can be avoided through being prepared and implementing controls at the optimum time.

FIGURE A: An integrated weed management system relies on a large number of interrelated, complementary components. All inputs into the system are important.



Think about the whole farming system

In developing a strategy it is important to consider weed management in the context of other in-crop agronomic issues, other crops and across the whole farm.

Crop competition

Most agronomic decisions have some impact on weed management. An evenly established, vigorously growing cotton crop can compete strongly with weeds, especially later in the season. Decisions such as cotton planting time, pre-irrigation versus watering-up, methods of fertiliser application, stubble retention and in-crop irrigation management all have an impact on weed emergence and growth. An evenly established, vigorously growing cotton crop can compete strongly with weeds, especially later in the season. Delaying planting on weedy fields until last, gives more opportunity to control weeds that emerge prior to planting and better conditions for cotton emergence and early vigorous growth. Research has shown that in irrigated crops, weed-free periods of 8-9 weeks from planting cotton provides enough time for the crop to out-compete later emerging weeds and significantly reduced seed production. Refer to the Weed Threshold in the Cotton Production Manual.

Plan weed management to fit with other operations

Look for opportunities in the cropping system to time operations to combine weed control tillage. There are a number of opportunities, particularly in irrigated cotton, where tillage can be used. These include pupae busting, incorporation of fertilisers, seed bed preparation and maintaining irrigation furrows.

Consider impact of weeds on the whole farming system

Weed management is also an important consideration for pest and disease management. Many cotton pests rely on weed hosts and cotton volunteers prior to migrating into cotton fields. Pests that gain the greatest advantage from weeds are those that are unable to hibernate/over winter when conditions are unfavourable, such as spider mites, cotton aphids, mirids and silver leaf whitefly. Some weeds and cotton volunteers/ ratoons can act as a reservoir for plant viruses such as cotton bunchy top disease which can cause significant loss of yield. Certain weeds that host diseases can also allow inoculum to build up in the soil increasing the risk for subsequent crops.

Rotation crops

Rotation crops provide an opportunity to introduce a range of different tactics into the system particularly herbicide groups that are not available in cotton. Having a mix in rotations may also vary the time of year non-selective measures can be used and the time of year that crop competition suppresses weed growth. Rotation between summer and winter cropping provides opportunities to use cultivation and knockdown herbicides in-fallow at all times of the year. Where cotton is grown in rotation with crops, such as winter cereals or maize, retaining the stubble cover from these rotation crops for as long as possible reduces weed establishment and encourages more rapid breakdown of weed seed on the soil surface. In terms of the HRMS, rotation crops should be considered similar to a fallow, and with the aim to use at least 2 non-glyphosate tactics.

SUGGESTED INTERVALS FOR SOME COMMON DOUBLE KNOCK HERBICIDE COMBINATIONS IN THE NORTHERN GRAINS REGION

Weed	First application	Second application	Recommended timing*	Comments
BROADLEAF WEEDS				
Most broadleaf weeds	glyphosate	Group L (e.g. paraquat)	7 to 21 days. Optimal timing is generally 10 to 14 days	
Difficult to control broadleaf weeds such as fleabane (*Conyza bonariensis*)	Group I (e.g Amicide® Advance, Tordon®) with or without glyphosate	Group L (e.g. paraquat)	7 to 21 days. Optimal timing is generally 7 to 10 days	If interval is greater than 14 days, use maximum label rates of Group L herbicide
	glyphosate plus saflufenacil	Group L (e.g. paraquat)	7 to 21 days. Optimal timing is generally 10 to 14 days	Only target rosettes less than 6 leaf
Difficult to control broadleaf weeds such as sowthistle/ milkthistle (*Sonchus oleraceus*)	glyphosate	2,4-D	2 to 4 days	Recommended to split applications due to incompatibility within the plant. As both products are systemic, the interval needs to be short.
	glyphosate	Group L (e.g. paraquat)	7 to 10 days.	Only target small rosettes
	glyphosate plus saflufenacil	Group L (e.g. paraquat)	7 to 21 days. Optimal timing is generally 10 to 14 days	Only target small rosettes
GRASS WEEDS				
Most grass weeds including: Annual ryegrass (*Lolium rigidum*) Barnyard grass (*Echin ochloa colona* & *E. crus-gali*)	glyphosate	Group L (e.g. paraquat)	4 to 14 days. Optimal timing is generally 5 to 7 days	
Feathertop Rhodes grass (*Chloris virgata*)	haloxyfop	Group L (e.g. paraquat)	7 to 14 days. Optimal timing is generally 7 to 10 days	Refer to APVMA permit 12941 (QLD ONLY)
Windmill grass (*Chloris truncata*)	quizalofop	Group L (e.g. paraquat)	5 to 14 days. Optimal timing is generally 7 to 10 days	Refer to APVMA permit 13460 (NSW ONLY)

SOURCE: Independent Consultants Australia Network

Non-crop areas

Non-crop areas on the farm such as channels, tail drains, fence lines and roadsides can be a source of development and introduction of herbicide resistance into the farming system. Manage these areas as a fallow, using a range of tactics including residual herbicides and chipping of weeds. Do NOT rely on glyphosate to manage weeds in non-crop areas.

Come Clean Go Clean

To minimise the entry of new weeds into fields, clean down boots, vehicles, and equipment between fields and between properties. Pickers and headers require special attention. Eradicate any new weeds that appear while they are still in small patches. Monitor patches frequently for new emergences.

Irrigation water can be a source of weed infestation with weed seeds being carried in the water. While it is not practical to filter seeds from the water, growers should be on the look out for weeds that gain entry to fields via irrigation. Give special consideration to water pumped during floods, as this has the greatest potential to carry new seeds. If possible, flood water should be first pumped into a storage to allow weed seeds to settle out before being applied to fields. Control weeds that establish on irrigation storages, supply channels and head ditches.

Control survivors before they set seed

To be effective in preventing resistance, weeds that survive a herbicide application must be controlled by another tactic before they are able to set seed. Spray applications should be monitored soon after a control is implemented, to assess efficacy. Weed audits are a requirement of growing Liberty Link and Roundup Ready Flex cottons. See pages 102–105 for details. Weeds may need to be closely examined, as some are capable of setting seed while very small and many weeds respond to varying day-length, so a winter weed emerging in late winter or spring may rapidly enter the reproductive phase of growth in response to lengthening daylight hours.

For a range of reasons, situations will occur when some weeds escape control by herbicides. Missed strips due to blocked nozzles, inadequate tank mixing, poor operation of equipment, insufficient coverage due to high weed numbers, applying the incorrect rate and interruptions by rainfall, are just a few reasons why weeds escape control. If herbicide resistant individuals are present, they will be amongst the survivors. It is critical to the longer term success of an IWM strategy that survivors not be allowed to set seed.

EFFICACY OF KNOCKDOWNS IN FOUR WINTER FALLOW FIELD EXPERIMENTS, MEASURED AT 6 WEEKS AFTER TREATMENT, WHEN APPLIED TO 1- AND 3-MONTH-OLD WEEDS (THE RANGE OF EFFICACY ACROSS THE EXPERIMENTS IS IN BRACKETS)

Herbicide	Weed control (%)			
	1-month-old weeds		3-month-old weeds	
Glyphosate + 2,4-D	84	(62–100)	76	(63–96)
Glyphosate + Tordon 75-D®	93	(86–99)	84	(62–98)
Glyphosate + 2,4-D fb Spray.Seed®	96	(93–100)	93	(87–97)
Glyphosate + Tordon 75-D® fb Spray.Seed®	99	(97–100)	97	(92–100)
Glyphosate + 2,4-D fb Alliance®	96	(92–99)	90	(78–100)
2,4-D fb Spray.Seed®	97	(97–98)	83	(68–97)
2,4-D#	88	(81–95)	53	(48–57)
Amitrole®#	90	(84–95)	96	(95–97)
Spray.Seed®#	84	(78–89)	22	(13–30)

fb = followed by a 7-day interval
# = applied in only two of the four field experiments
Source: Steve Walker (QAAFI, University of Queensland), Michael Widderick, Andrew McLean and Jeff Werth (Toowoomba, DAFF);

In terms of survivor control, research indicates that high efficacy with an alternative tactic is good, but high frequency control is better than reliance on efficacy. Cultivation after glyphosate application, is predicted to achieve 80% survivor control, whereas cultivation plus chipping is predicted to achieve 99.9% survivor control. Other tactics for survivor control could be equally effective, such as shielded or spot-spraying with an effective knockdown herbicide. See also In-crop Tactics below.

Manual chipping

Manual chipping is ideally suited to dealing with low densities of weeds, especially those that occur within the crop row. It is normally used to supplement inter-row cultivation or spraying. Historically chipping has been an important part of the cotton farming system, however this has dramatically reduced in recent years. As a tool to prevent survivors setting seed, chipping has been shown to be a cost effective means of preventing survivor seed set.

Spot spraying

Spot sprayers may be used as a cheaper alternative to manual chipping for controlling low densities of weeds in-crop. Ideally, weeds should be sprayed with a relatively high label rate of a herbicide from a different herbicide group to the herbicides most recently used to ensure that all weeds are controlled. This intensive tactic can be particularly useful for new weed infestations where weed numbers are low, or where weeds are outside of the field and difficult to get to, such as roadside culvets.

New weed detection technologies provide an opportunity to use spot spraying across large areas of fallow. This can provide opportunity to reduce herbicide costs, while still ensuring robust label rates are applied to problem weeds. Refer to the herbicide label for plant-back limitations relevant to the rate applied. Permit Per11163 provides details for herbicides and rates that can be applied in conjunction with weed detect technology. The permit is valid until 28 Feb 2015. Applicators should follow manufacturer recommendations for speed and nozzle type, as well as allowable products to ensure that application is effective.

In-crop tactics

Pre-plant / at planting

Prior to planting there is an excellent opportunity to incorporate a non-glyphosate herbicide or combination of herbicides, or to integrate cultivation with a pre-planting operation such as seed bed preparation. In irrigation systems consider utilising pre-irrigating to cause a flush of weeds to emerge and be controlled before cotton emergence.

Knockdown herbicides from Group C (Bromoxynil), Group I (2,4-D, Dicamba, Fluroxypyr), Group L (paraquat, paraquat/diquat), Group M (glyphosate) and Group N (glufonsinate) can be used to target weeds that have emerged in the field. This can be made more effective when used as a double knock (refer to Suggested intervals for some common knockdown herbicide combinations page 93). Refer to Table 24: Plant backs to cotton for herbicides used in seedbed preparation.

Residual herbicides remain active in the soil for an extended period of time (months) and can act on successive weed germinations. This can

be particularly effective in managing the earliest flushes of in-crop weed, when the crop is too small to complete. Broadleaf and grass weeds can be targeted with residual herbicides from Group C (fluometuron/prometryn, fluometuron, prometryn) and grass weeds only targeted with Group D (pendimethalin, trifluralin,) or group K (S-metolachlor).

Most residual herbicides need to be incorporated into the soil for optimum activity. Adequate incorporation of some residual herbicides is achieved through rainfall or irrigation, but others require incorporation through cultivation. Soil surfaces that are cloddy or covered in stubble may need some pre-treatment such as light cultivation or burning to prevent 'shading' during application. Ash from burnt stubble may inactivate the herbicide, and therefore must be dissipated with a light cultivation or rainfall prior to herbicide application.

Crop safety is an important consideration for use of residuals. Always follow label direction and if you are inexperienced in the use of residuals in cotton it is encouraged that you discuss your circumstances with your consultant, chemical supplier or the manufacturer.

The persistence of residual herbicides needs to be considered in order to avoid impacts on rotation crops. Persistence is determined by a range of factors including application rate, soil texture, organic matter levels, soil pH, rainfall/irrigation, temperature and the herbicide's characteristics. It can be quite complex. For example, moisture can be a big factor, however it is not the volume of rain, but the length of time the soil is moist that is the critical factor. A couple of storms, where the soil dries out quickly won't contribute as much to the breakdown of residuals, compared with soil staying moist for a few days. Tables 23 to 26 provide information on some plant-back limitations. Refer to product label for more information. If growers are concerned that the residual is still active in the lead up to planting, look for the presence of susceptible weeds in the treated paddock or pot up soil from the treated and untreated area, sow the susceptible crop and compare emergence. Where there is a concern, plant the paddock last and pre-irrigate if it is to be irrigated. It is important to ensure that best practice is followed in terms of capture and management of runoff water.

Post emergence

Once cotton has emerged there are still many opportunities to incorporate different tactics. Check label for restrictions on node development.

Herbicide tolerant cotton traits, mean that weeds need only be controlled if and when germinations occur, meaning herbicide application can be timed to have maximum impact on weed populations. When targeting the over the top application of glyphosate (Round up Ready Flex), or glufosinate (Liberty Link) aim to treat actively growing weeds, and avoid allowing weeds to become too large. Avoid using the same herbicide to control successive generations of weeds, and ensure survivors are not able to set seed. Do not apply more than the allowable number of OTT applications. Refer to pages 98 and 102–105 for more information.

Grass selective herbicides (Group A) can be applied over the top of cotton. This group has a high risk of resistance and repeated use will lead to the development of Group A resistance. It is important that in managing glyphosate resistance, that resistance to other herbicides doesn't develop.

The Metolachlor label now includes over the top use in-crop from 4 node up to 18 node crop growth and can be used with glyphosate. This provides additional residual control of grass weeds.

To avoid leaf spotting use a directed or shielded spray. Other lay-by/ shielded spray options include prometryn, diuron, flumioxazin, and pendimethalin.

In-crop cultivation, and if required chipping, provides important non-herbicide options for control of herbicide survivors. Cultivating when the soil is drying out is the most successful strategy for killing weeds and will reduce the damage to soil caused by tractor compaction and soil smearing from tillage implements. Care should be taken in set up to minimise the plant damage. Inter row cultivation can increase Fusarium Wilt.

Post-harvest

Some weeds are likely to be present in the crop later in the season – even in the cleanest crop. These weeds will produce few seeds in a competitive cotton crop, but can take advantage of the open canopy created by defoliation and picking. Removing the crop residues and weeds as soon after picking as practical greatly reduces the opportunity for these weeds to set seed. Refer to management of volunteers and ratoons (page 114).

Fallow management

Weed management in the fallow is an important component of a weed management plan. Summer fallows where glyphosate only is used, poses the greatest risk to glyphosate resistance development. The herbicide resistance management strategy recommends at least two non-glyphosate tactics in summer fallows. Residual herbicides and double knock tactics provide good alternatives to a glyphosate only fallow. Refer to table 23 herbicide plant backs from rotation crops to cotton. Strategic cultivation may be required to remove larger weeds.

For more information: The Cotton Production Manual includes further information on weed control tactics.

TABLE 23: Herbicide plant backs from rotation crops to cotton

Trade name	Herbicide active ingredient	Registered for use in	Plant back to cotton	Notes
Hotshot	aminopyralid + fluroxypyr	Cereal Crops: wheat, barley, oats, triticale fallows	9 months	Plant back interval on black cracking clay soils. When rainfall is less than 100mm for a period of 4 months or greater the plant back period may be significantly longer.
atrazine	atrazine	Cereal Crops: broom millet, maize, sorghum Legume Crops: lupins Other Field Crops: forage sorghum, potatoes, TT canola, sugarcane Pastures: lucerne, grass pastures	6 months	Following treatments of up to 1.4kg/ha
			18 months	Following treatments of 1.4kg/ha to 3.3kg/ha
Primextra Gold	atrazine + s-metolachlor	Cereal Crops: sorghum, maize. Other Field Crops: sugarcane	6 months	When rates up to 3.2 L/ha are used.
			18 months	When rates up to 3.2 L/ha are used. On alkaline soils, a bioassay or analytical test should be undertaken.
Glean	chlorsulfuron	Cereal Crops: wheat, barley, triticale, oats, cereal rye	18 months	Where soil pH is 6.6–7.5 and 700 mm of rain has fallen. For soil pH >7.5 only grow cotton after growing a test strip.
Lontrel750SG	clopyralid	Cereal Crops: wheat, barley, oats, triticale. Other Field Crops: canola. Pastures and Fallows	3 months	When rates up to 30g/ha are used.
			6 months	When rates of 30–120g/ha are used.
			24 months	When rates above 120 g/ha are used. For all rates at least 100mm rain required during plant back period.
diuron	diuron	Cereal Crops: wheat, barley, oats, triticale, cereal rye. Legumes: lupins. Pastures: perennial grass seed crops, lucerne	DO NOT replant treated areas within 2 years of application of diuron except when otherwise stated on label	
Broadstrike	flumetsulam	Cereal Crops: winter cereals, maize. Legume Crops: chickpeas, field peas, lentils, soybeans. Other Field Crops: peanuts, fenugreek, lathyrus. Pastures: lucerne, serredella, clover, medic, Popany vetch	6 months (NNSW, QLD) Not stated SNSW	When rates up to 25g/ha are used. Dependent on rainfall (Soil wetness for at least 1 week) and soil type.
			9 months (NNSW, QLD) Not stated SNSW	When rates of up to 50g/ha are used Dependent on rainfall (Soil wetness for at least 1 week) and soil type.
			2 years	On shallow duplex, low organic matter soils with impermeable sub-horizon within root zone (30cm deep or less) and alkaline
Balance	isoxaflutole	Legume Crops: chickpeas. Other Field Crops: sugarcane, fallow	7 months	350 mm rainfall (do not include flood/furrow irrigation) between application and planting the subsequent crop.
Sakura	Pyroxasulfone	wheat (not Durum), triticale	5 months + 150mm of rainfall	Less total rainfall between application and planting of the following crop than 150 mm may require extended plant back period.
Spinnaker	imazethapyr	Legume Crops: chickpeas, faba beans, field peas, mungbeans, soybeans. Other Field Crops: peanuts. Pastures: lucerne, serradella, sub clovers	22 months.	Dryland cotton.,
			18 months.	Irrigated only. (Providing rainfall and irrigation exceeds 2000mm)
Tordon 75D	picloram + 2,4-D	Cereal Crops: wheat, barley, oats, triticale, sorghum, maize. Other Field Crops: sugarcane. Pastures: Pastures	12 months (Nth NSW & Qld)	Do not use on land to be cultivated for growing susceptible crops within 12 months of application. Based on normal rainfall.
Tordon 242	picloram + MCPA		12 months (Nth NSW & Qld) 20 months (Sth NSW)	Based on normal rainfall.
simazine	simazine	Legume Crops: chickpeas, faba beans, lupins. Fruit & vegetable crops, Forestry & Ornamental. Other Field Crops: TT canola. Pastures: lucerne, sub clover, perennial grasses	9 months	When up to 2.5kg/ha are used.
Logran	triasulfuron	Cereal Crops: wheat, barley, oats	15 months Soil pH Less than 7.5	700 mm rainfall between application and sowing the plant back crop.
			18 months Soil pH 7.6–8.5	
Grazon Extra	triclopyr + picloram + aminopyralid	Fallow	4 months (0.2L/ha) 6 months (0.4L/ha)	During drought conditions (<100mm rainfall in a 4 month period) the plant back is significantly longer

TABLE 23: Herbicide plant backs from rotation crops to cotton (continued)

Trade name	Herbicide active ingredient	Registered for use in	Plant back to cotton	Notes
Hussar	mefenpyr-diethyl + iodosulfuron-methyl sodium	Cereal Crops: wheat.	12 months	Rainfall of less than 500mm following Hussar use may result in extended re-cropping intervals for summer crops sown in the following season.
Sencor 700 Sencor 480	metribuzin	Cereal Crops: wheat, barley, oats. Legume Crops: chickpeas, faba beans, lentils, vetch, lupins, field peas, soybeans (irrigated). Other Field Crops: potatoes.	12 months 6 months for rates <1.5L/ha; 12 months for rates > 1.5L/ha	This could be longer if there have been long dry periods between crops.
Atlantis	metsulfuron methyl + mefenpyr-diethyl	Cereal Crops: wheat	12 months.	Rainfall of less than 500mm following Atlantis use may result in extended re-cropping intervals for summer crops sown in the following year.

TABLE 24: Plant backs to cotton for herbicides used in seedbed preparation

Herbicide active ingredient	2,4-D amine 700 g/L (2,4-D amine 300 g/L)			dicamba 700 g/kg (dicamba 500 g/L)			fluroxypyr 200 g/L (fluroxypyr 333g/L)			triclopyr 600 g/L
Rate L or g/ha	0.5 (1.1)	0.5–.98 (1.1–2.3)	0.98–1.5 (2.3–3.4)	140 (200)	200 (280)	400 (560)	0.375 (0.225)	0.75 (0.45)	1.5 0.9)	0.16
Plant back[1] (days)	10	14	21	7	7	14	14	14	28	14

[1] If applied to dry soil, at least 15 mm rain is required before plant back period begins.

TABLE 25: Herbicides with unknown plant back periods to cotton

Trade name	Active ingredient	Registered for use in
Raptor	imazamox	Legume Field Crops: field peas, soybeans. Other Field Crops: peanuts. Pastures: lucerne, legume-based pastures.
Intervix	imazamox + imazapyr	Clearfield crops (all other – 34 months).
Ally	metsulfuron methyl	Cereal Crops: wheat, barley, triticale Legume Crops: chickpeas (desiccant).
Harmony M	metsulfuron methyl + thifensulfuron	Cereal Crops: wheat, barley, triticale.
Monza	sulfosulfuron	Cereal Crops: wheat, triticale.
Express	tribenuron methyl	Fallows.

Where fields have been treated with herbicides with no plant back recommendations to cotton, firstly determine the tolerance of cotton grown through to maturity on a smaller scale before sowing larger areas.

TABLE 26: Cotton herbicide plant backs to rotation crops

Herbicide active ingredient	Plant backs from cotton to rotation crops (months)																				
	Cereal grain-crops							Legume crops										Other crops			
	Barley	Maize	Millet	Oats	Sorghum	Triticale	Wheat	Adzuki bean	Chickpea	Cow pea	Fab bean	Field pea	Lab Lab	Lupin	Lucerne	Mungbean	Pigeon pea	Soybean	Canola	Safflower	Linseed	Sunflower
chlorthal dimethyl	8	8	8	8	8	8	8	8	8	8	8	8	8	8	FH	FH	8	FH	8	8	8	8
diuron	24	24	24	24	24	24	24	24	24	24	24	24	24	24	12	24	24	24	24	24	24	24
fluometuron	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
fluometuron + prometryn	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
halosulfuron-methyl	24	2	24	24	2	24	3	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
metolachlor	6	0	6	6	0[1]	6	6	6	6	6	6	6	6	6	6	6	6	0	6	6	6	0
norflurazon[2]	24	21	NI	24	21	24	24	NI	3	NI	24	NI	NI	NI	NI	21	NI	3	NI	18	18	27
pendimethalin	6	0[3]	12	12	12	NI	NI	NI	NI	NI	NI	NI	NI	NI	6	NI	NI	NI	6	NI	NI	NI
prometryn	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
s-metolachlor	6	0	6	6	0[1]	6	6	6	6	6	6	6	6	6	6	6	6	0	6	6	6	0
trifloxysulfuron sodium	6	22	22	6	22	22	6	22	18	22	7	22	22	22	22	9	15	15	22	22	22	22
trifluralin	12	12	12	12	12	12	12	FH	FH	FH	FH	FH	FH	FH	FH	FH	FH	FH	FH	FH	FH	FH

1 Concep II treated seed only.
2 For rates up to 3.5 kg/ha. Where higher rates, up to 4.2 kg/ha are used, increase plant back period by 6 months.
3 Maize can be resown immediately after use in a failed crop provided the seed is sown below the treated band of soil. Further information in Weed control in Summer and Winter Crop Publications from NSW DPI

FH = following cotton harvest
NR = not recommended
NI = no information
S = in the spring following application

This document is part of a larger publication -
The Cotton Pest Management Guide for Cotton 2014 - 15

The complete document can be found on the CRDC or myBMP web sites during the 2014-15 Australian cotton season
www.crdc.com.au
or
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