2018-19 2,4-D Spray Drift Instructions

A summary of changes by the APVMA

13 February 2019

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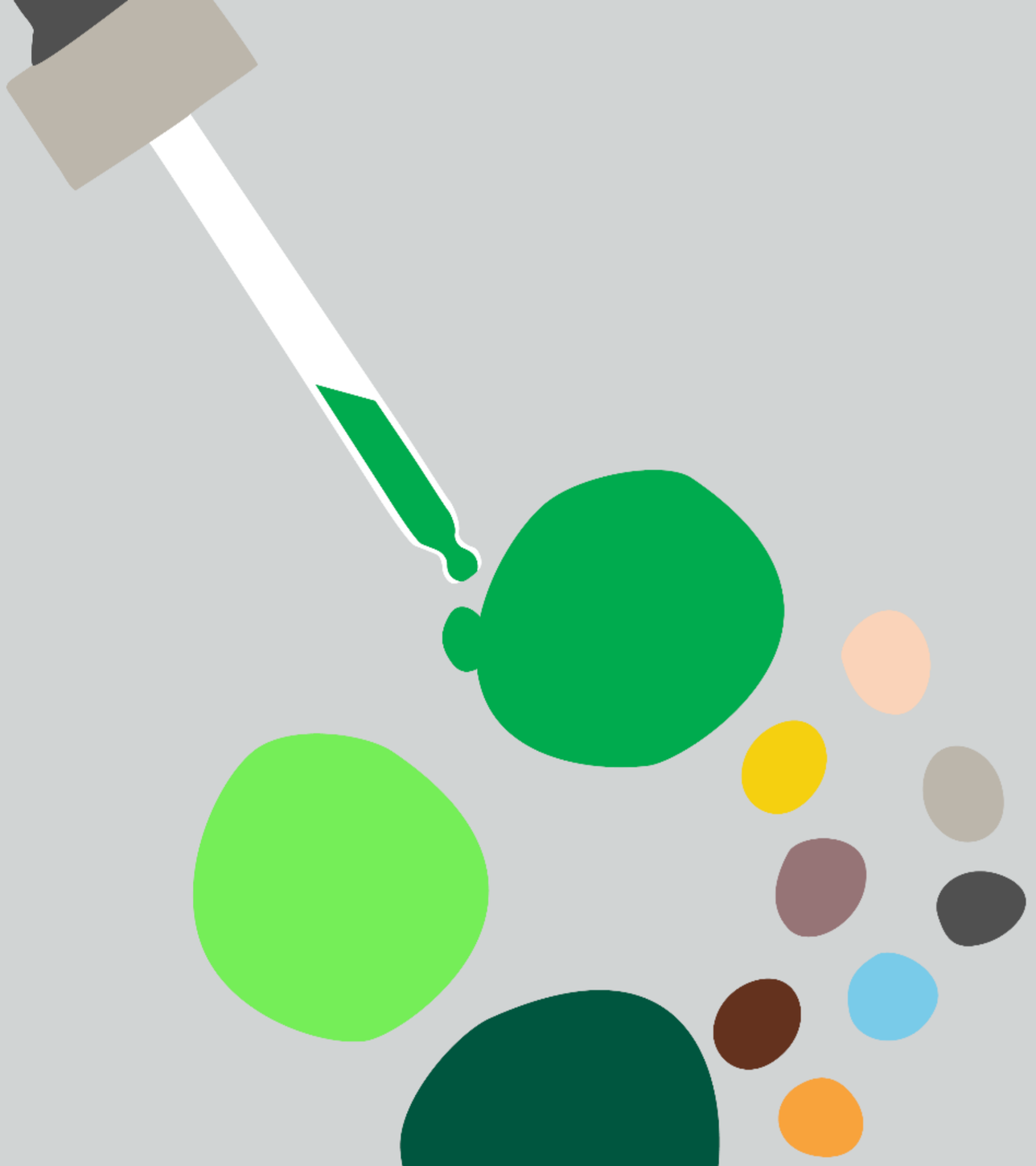
Grow a better tomorrow

On 4 October 2018, APVMA announced interim measures from their review of 2,4-D which require new spray drift instructions for the 2018-19 season.

The full APVMA review is expected to be completed in Feb 2019



Who is affected?

- Anyone applying 2,4-D products is obliged to follow the new label directions
- Manufacturers have new labels on all 2,4-D products manufactured after 1/11/18
- Manufactures are to provide access to these labels for all 2,4-D product
- Advisors need to be aware of the changes to ensure spray recommendations do not breach the new labels

What's new?

- Minimum mandatory droplet size increases to VERY COARSE (currently COARSE)
  - Farmers are advised to use a larger droplet size (EXTREMELY COARSE or ULTRA COARSE) until 15 April 2019
- Downwind buffer zones have been established from sensitive vegetation and aquatic areas
- Boom height is restricted to a maximum of 50cm above apparent target surface (either the crop canopy, average weed height or top of stubble)

What hasn’t changed?

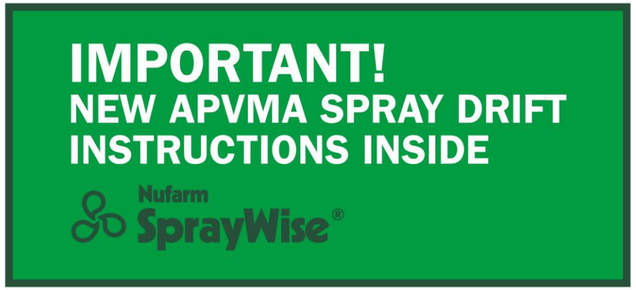
DO NOT spray when surface temperature inversion conditions are present (but more information is now available on labels)

DO NOT apply in a manner that may cause an unacceptable impact to native vegetation, agricultural crops, landscaped gardens and aquaculture production, or cause contamination of plant or livestock commodities, outside the application site from spray drift

What is Nufarm doing?

For products made prior to 1 November 2018, All resellers and farmers will be emailed a link where updated labels can be downloaded.

- **For products made on or after 1 November 2018**, updated labels will be on all products containing 2,4-D.
- Only the back multifolds with the booklets will change initially and these will have a logo printed on the top to remind users of the changes.
- Products affected:
  - AMICIDE ADVANCE 700
  - ESTERCIDE XTRA 680
  - 2,4-D AMINE 625
  - COBBER 475
  - TROOPER 75-D
  - ESTERCIDE 800
  - ZEPHYR 625
  - BATON LOW



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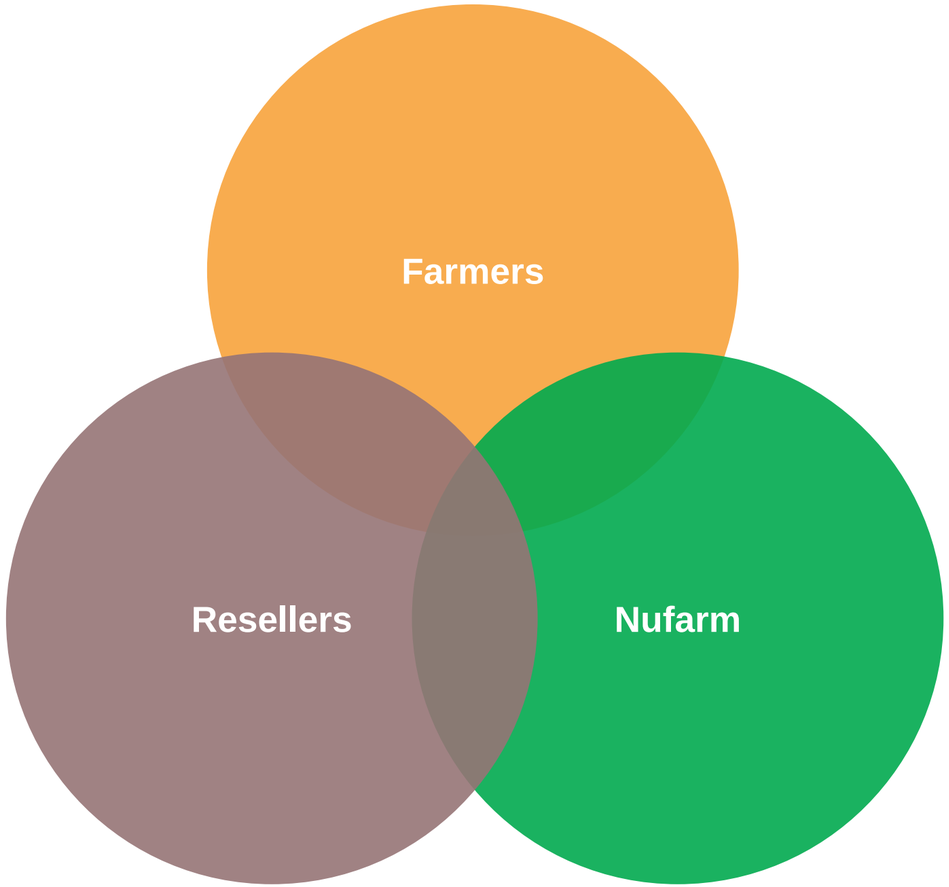
Responsibilities to implement the changes



- **To follow the new APVMA spray drift instructions**
- **New approved labels on containers for product made after 1 Nov and to provide electronic versions for product made prior (we will be doing this via our TopCroppers network and social media channels as well as website).**
- **To ensure customers have the new instructions for product at the point of sale of product made prior to 1 Nov 2018 (and if not provide on email or print a hard copy)**

NOTE: Electronic copies are acceptable to meet supply obligations as APVMA Notice does not specifically require hard copies.

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Explanation of new label instructions

Users can’t cause adverse off-target impacts from spray drift

- DO NOT apply in a manner that may cause an unacceptable impact to native vegetation, agricultural crops, landscaped gardens and aquaculture production, or cause contamination of plant or livestock commodities, outside the application site from spray drift. The buffer zones in the relevant buffer zone tables below provide guidance but may not be sufficient in all situations. Wherever possible, correctly use application equipment designed to reduce spray drift and apply when the wind direction is away from these sensitive areas.
- DO NOT allow bystanders to come into contact with the spray cloud.

- *Both of these instructions remind users of their existing obligations under local, state and federal laws.*

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Weather conditions

- **DO NOT** apply unless the wind speed is between 3 and 15 kilometres per hour at the application site during the time of application.
- **DO NOT** apply if there are surface temperature inversion conditions present at the application site during the time of application. These conditions exist most evenings one to two hours before sunset and persist until one to two hours after sunrise.
- **Recognising a surface temperature inversion**
  - A surface temperature inversion is likely to be present if:
  - Mist, fog, dew or a frost have occurred
  - Smoke or dust hangs in the air and moves sideways, just above the ground surface
  - Cumulus clouds that have built up during the day collapse towards evening
  - Wind speed is constantly less than 11 km/hr in the evening and overnight
  - Cool off-slope breezes develop during the evening and overnight
  - Distant sounds become clearer and easier to hear
  - Aromas become more distinct during the evening than during the day.

Information from GRDC Fact Sheet: 'Surface Temperature Inversions and Spraying', Jul 2014.

- **Spray timing**
  - Spray during the day wherever possible. Vertical mixing of the air makes surface temperature inversions unlikely and will reduce the risk of drift caused by surface temperature inversions.
  - There is a very low risk of surface temperature inversion when there is continuous overcast weather, with low and heavy cloud and/or wind speed remains above 11km/h for the whole period between sunset and sunrise.
  - A lack of suitable weather conditions for spraying over extended periods is not an excuse for spraying in unsuitable conditions.
- Watch for changes in weather conditions. Stop spraying immediately if a surface temperature inversion occurs or if spraying conditions become unsuitable for any other reason.

- *Wind speed must be measured at the site of application to ensure you are spraying in the 3 to 15 km/hr range. This should be done at least before starting a job and at every tank fill; keep an eye out for visual signs the conditions may have changed at any time during spraying and be prepared to stop. Use weather forecasting services like SprayWise Decisions to help plan your spraying in advance.*
- *In addition to the new information about surface temperature inversions conditions, continue to refer to Nufarm's 24 hour risk profile for summer spraying graphic to assist you.*

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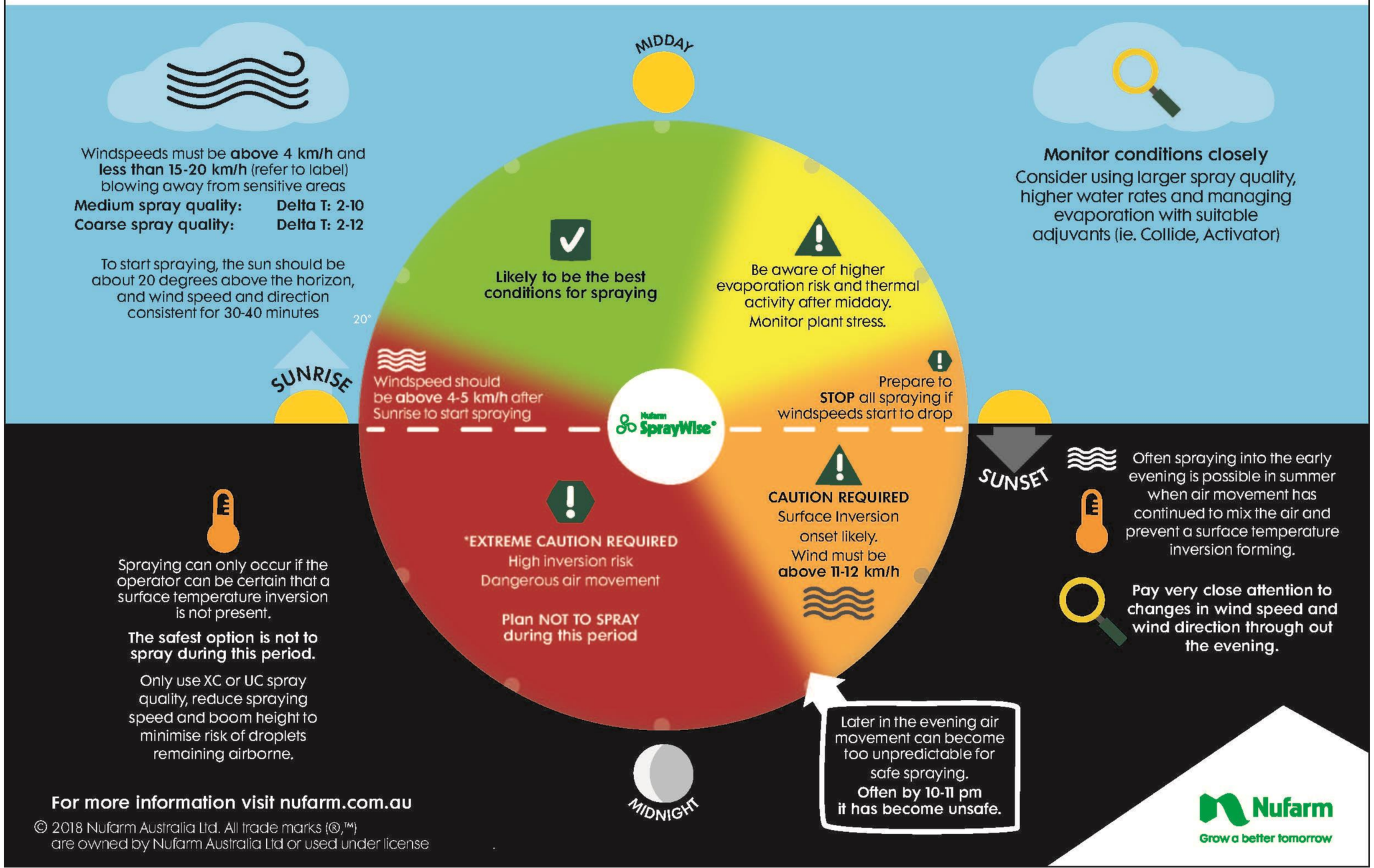
24 Hour risk profile for Summer spraying

Always follow label instructions



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Droplet size / spray quality

- **MANDATORY MINIMUM:**
  - **DO NOT** apply with spray droplets smaller than **VERY COARSE** spray droplets according to the "**APVMA Compliance Instructions for Mandatory VERY COARSE or Larger Droplet Size Categories"** section of the GENERAL INSTRUCTIONS.*
- **ADVISORY FOR BOOM SPRAYER USE IN CEREALS, FALLOW AND PASTURE 3RD OCTOBER TO 15TH APRIL**
  - USE NOZZLES THAT PRODUCE EXTREMELY COARSE (XC) TO ULTRA COARSE (UC) DROPLETS.
  - USE HIGHER WATER RATES PER HA, TO GIVE BETTER EFFICACY.
  - USE SLOWER APPLICATION SPEEDS TO ALLOW OPERATORS TO LOWER BOOM HEIGHTS.
  - INCREASING DROPLET SIZE AND WATER RATES WHILE REDUCING APPLICATION SPEED WILL ASSIST IN MITIGATING OFF TARGET INVERSION DRIFT DURING SUMMER SPRAYING. EXTREMELY COARSE DROPLETS WILL PRODUCE <3% DRIFTABLE DROPLETS.

- *Ground application: * Note that the APVMA has has provided further information - the APVMA recognises five different standards for droplet size classification (three versions of ASAE, BCPC and ISO).*
- *Efficacy will be maintained if the rest of the label is followed for VERY COARSE droplet application. For larger droplets in the advisory instructions it is essential to increase water rates and reduce application speeds, especially when targeting small grasses with tank-mix partners.*
- *Contact Croplands (1800 999 162) to discuss your nozzle needs*

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NOZZLE SELECTION GUIDE*

January 2019

		Low Pressure Air Induction (RUN ABOVE 2-3 BAR)													High Pressure Air Induction (RUN ABOVE 3-4 BAR)											
BRAND		Hypro	TeeJet	Lechler	Agrotop	Hypro	Hardi	Hardi	Lechler	TeeJet	Hypro	Belle-ricay	ARAG	Albuz		TeeJet	ARAG	Lechler	Albuz	Albuz	ARAG	ARAG	Hardi	ARAG	Agrotop	Teejet	TeeJet	TeeJet
MODEL		Guardian Air Twin	AI3070 TwinJet	IDK-120	Airmix	Guardian Air	Minidrift-DUO twinjet	Minidrift	IDKT twinjet	AIXR	ULD-120	bubble-jet	CFA	CVI		AITTJ60 twinjet	AFC	ID	AVI-twin	AVI	CFA-ULTRA	TFLD twinjet	Injet	TFA twin jet	Turbo-drop TD-XL-D	AI	TTI60 twinjet	TTI
SPRAY QUALITY STANDARD		ASABE 572.1	ASABE 572.1	ASAE/BCPC	ASAE/BCPC	ASABE 572.1	ASAE/BCPC	ASAE/BCPC	ASAE/BCPC	ASABE 572.1	ASABE 572.1	ASABE 572.1	ASABE 572.1	ASABE 572.1		ASABE 572.1	ASABE 572.1	ASAE/BCPC	ASABE 572.1	ASABE 572.1	ASABE 572.1	ASABE 572.1	ASAE/BCPC	ASABE 572.1	ASABE 572.1	ASABE 572.1	ASABE 572.1	ASABE 572.1
Nozzle Size	BAR														BAR													
01 ORANGE	1.5												XC		1.5		XC											
	2.0	not available in this size	not available in this size	C	M	not available in this size	not available in this size	not available in this size	not available in this size	not available in this size	not available in this size	VC	?	not available in this size	2.0	not available in this size	XC			VC		not available in this size	VC	not available in this size	not available in this size	not available in this size	not available in this size	not available in this size
	3.0			C	M							C	C		3.0		XC	C	XC	VC	VC		VC					
	4.0			M	F							C	C		4.0		C	C	XC	C	VC		VC					
	5.0			M	F							C	C		5.0		C	C	C	C	C		VC					
	6.0			F	F							C	?		6.0		C	C	C	C	C		C					
	7.0											M	M		7.0		C	M		C	C		C					
	8.0												M		8.0		C	M			C		C					
015 GREEN	1.5		VC	C		UC		C		VC	UC		VC	VC	1.5		XC											UC
	2.0	not available in this size	C	C	XC	XC	not available in this size	C	not available in this size	C	XC	XC	?	VC	2.0	not available in this size	?			VC		not available in this size	VC	not available in this size	not available in this size	UC	not available in this size	UC
	3.0		M	C	C	C		C		C	VC	VC	C	VC	3.0		VC	VC	XC	VC	VC		VC			XC		UC
	4.0		M	M	C	M		M		M	C	C	C		4.0		C	C	XC	VC	VC		VC			XC		XC
	5.0		F	M	C	M		M		M	C	C	C		5.0		C	C	C	VC	C		VC			VC		XC
	6.0		F	F	M	M		M		M	M	C	C		6.0		C	C	C	C	C		VC			VC		XC
	7.0		F			M					M	C	C		7.0		C	C		C	C		VC			C		VC
	8.0										M		M		8.0		C	M			C		C			C		
02 YELLOW	1.5		VC	VC		XC	VC	VC		VC	UC	VC	XC	VC	1.5	XC	UC					XC		UC	UC		UC	UC
	2.0	C	VC	C	C	VC	C	C	not available in this size	VC	XC	C	?	VC	2.0	VC	?			VC		XC		XC	UC	UC	UC	UC
	3.0	M	C	C	C	M	C	C		C	C	C	C	C	3.0	C	XC	VC	XC	VC	VC	XC	VC	XC	XC	XC	UC	UC
	4.0	M	M	M	M	M	C	C		M	C	M	C		4.0	C	VC	C	XC	VC	VC	VC	VC	VC	XC	XC	VC	UC
	5.0	M	M	M	M	M	M	M		M	M	M	C		5.0	M	C	C	C	VC	C	?	VC	?	XC	VC	VC	XC
	6.0	M	F	M	M	M	M	M		M	M	M	C		6.0	M	C	C	C	VC	C	C	VC	C	VC	VC	VC	XC
	7.0	F	F			M					M	M	C		7.0	M	C	C		C	C	C	VC	C		C	C	VC
	8.0	F									M		C		8.0		C	C			C	C	VC	C		C		
025 LILAC	1.5		XC	VC		XC	VC	VC		XC	XC	XC	XC	VC	1.5	XC	XC								UC		UC	UC
	2.0	UC	VC	VC	VC	VC	VC	VC	not available in this size	VC	XC	XC	?	VC	2.0	VC	?			XC					UC	UC	UC	UC
	3.0	VC	C	C	C	C	C	C		VC	C	VC	VC	C	3.0	C	VC	VC	not available in this size	VC	not available in this size	not available in this size	VC	not available in this size	XC	XC	XC	UC
	4.0	M	M	C	C	M	C	C		C	C	C	?		4.0	C	VC	VC		VC			VC		XC	XC	VC	UC
	5.0	M	M	M	M	M	M	M		C	M	C	C		5.0	M	C	VC		VC			VC		XC	VC	VC	XC
	6.0	M	M	M	M	M	M	M		M	M	C	C		6.0	M	C	C		VC			VC		VC	VC	VC	XC
	7.0	M	M			M					M	C	C		7.0	M	C	C		VC			VC			C	C	XC
	8.0	M									M		C		8.0		C	C					VC			C		
03 BLUE	1.5		XC	VC		UC	VC	VC	C	XC	XC	XC	XC	VC	1.5	UC	XC					UC		UC			UC	UC
	2.0	VC	XC	VC	VC	XC	VC	VC	C	VC	XC	XC	?	VC	2.0	XC	?			XC		XC		XC	UC	UC	UC	UC
	3.0	C	VC	C	C	VC	C	C	C	VC	C	VC	VC	C	3.0	VC	VC	VC	XC	XC	VC	XC	VC	XC	UC	XC	UC	UC
	4.0	M	C	C	C	C	M	C	M	C	C	C	VC		4.0	C	VC	VC	XC	VC	VC	XC	VC	XC	XC	VC	XC	UC
	5.0	M	M	M	C	M	M	C	M	C	M	C	VC		5.0	C	?	VC	VC	VC	VC	?	VC	?	XC	VC	XC	UC
	6.0	M	M	M	M	M	M	M	F	M	M	C	?		6.0	M	C	C	C	VC	VC	VC	VC	VC	XC	VC	VC	XC
	7.0	M	M		M	M					M	C	C		7.0	M	C	C		VC	VC	VC	VC	?		C	VC	XC
	8.0	M									M		C		8.0		C	C			C	VC	VC	C		C		
04 RED	1.5		UC	VC		XC	VC	VC	VC	XC	UC	XC	XC	VC	1.5	UC	XC					UC		UC	UC		UC	UC
	2.0	VC	XC	VC	VC	VC	C	VC	C	XC	UC	VC	XC	C	2.0	XC	XC			XC		XC		UC	UC	UC	UC	UC
	3.0	C	VC	VC	C	C	C	VC	C	VC	UC	C	XC	C	3.0	VC	XC	XC	XC	XC	not available in this size	XC	VC	UC	UC	XC	UC	UC
	4.0	M	VC	C	C	M	M	C	M	VC	XC	C	?		4.0	C	VC	VC	XC	VC		XC	VC	XC	XC	VC	XC	UC
	5.0	M	C	C	C	M	M	C	M	C	XC	C	VC		5.0	C	?	VC	VC	VC		?	VC	XC	XC	VC	XC	XC
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	8.0	M									C		C		8.0		C	C				VC	VC	VC		C		
05 BROWN	1.5		UC	XC		XC	VC	VC	VC	XC	UC	XC	XC	VC	1.5	UC	UC					XC		UC	UC			UC
	2.0	VC	XC	VC	VC	VC	C	VC	VC	XC	UC	XC	XC	C	2.0	XC	?			XC		XC		XC	UC	UC	UC	UC
	3.0	C	VC	VC	C	C	C	VC	C	VC	XC	VC	XC	C	3.0	VC	XC	XC	XC	XC	not available in this size	XC	VC	XC	UC	XC	UC	UC
	4.0	M	VC	C	C	C	M	C	C	VC	XC	C			4.0	VC	VC	XC	XC	XC		VC	VC	XC	UC	VC	XC	UC
	5.0	M	C	C	M	C	M	C	M	C	VC	C	VC		5.0	C	VC	VC	VC	VC		VC	VC	?	UC	VC	XC	UC
	6.0	M	C	M	M	M	M	C	M	C	VC	C	VC		6.0	M	VC	VC	C	VC		VC	VC	VC	XC	VC	VC	XC
	7.0	M	C			M					C	C	VC		7.0	M	?	VC		VC		VC	VC	VC		VC	VC	XC
	8.0	M									C		C		8.0		C	VC				VC	VC	VC		C		

Edited source from GRDC

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Buffer zones (ground application)

- **DO NOT** apply by a boom sprayer unless the following requirements are met:
  - spray droplets not smaller than a VERY COARSE (VC) spray droplet size category (minimum XC between 3 October and 15 April - advisory)
  - boom heights 0.5 metres or lower above the target canopy (The higher of either the crop canopy or the targeted weeds)
  - minimum distances between the application site and downwind sensitive aquatic and wetland areas including aquacultural ponds, surface streams and rivers (see Aquatic 'Downwind mandatory no-spray zone' section of the following table titled 'Buffer zones for boom sprayers') are observed.
  - minimum distances between the application site and downwind sensitive crops, gardens, landscaping vegetation, protected native vegetation or protected animal habitat (see Terrestrial 'Downwind mandatory no-spray zone' section of the following table titled 'Buffer zones for boom sprayers') are observed. The buffer zones provide guidance but may not always be completely protective of all agricultural crops.
  - [BUFFER ZONE TABLES VARY PRODUCT TO PRODUCT BASED ON DIFFERENCES IN TYPE OF 2,4-D AND LABEL USE PATTERNS]

- *Boom height is measured in the following ways:*
  - *Fallow uses: it is from the top of the target weeds (should be on the average height of weeds across the paddock)*
  - *In-crop uses: it is from the top of the crop canopy (when weeds are smaller than crop) or the top of the target weeds (when weeds are larger than crop)*

Buffer zones (aerial application)

- **DO NOT** apply by aerial application unless the following requirements are met:
  - spray droplets not smaller than a VERY COARSE (VC) spray droplet size category.
  - release height 5 metres or lower above the target canopy
  - minimum distances between the application site and downwind sensitive aquatic and wetland areas including aquacultural ponds, surface streams and rivers (see Aquatic ‘Downwind mandatory no-spray zone’ section of the following table titled ‘Buffer zones for aircraft) are observed.
  - minimum distances between the application site and downwind sensitive crops, gardens, landscaping vegetation, protected native vegetation or protected animal habitat (see Terrestrial ‘Downwind mandatory no-spray zone’ section of the following table titled ‘Buffer zones for aircraft) are observed. The buffer zones provide guidance but may not always be completely protective of all agricultural crops. **NOTE:- some rates ARE NOT SUPPORTED for Fixed Wing aircraft and MUST NOT be applied by fixed wing aircraft**
  - [BUFFER ZONE TABLES VARY PRODUCT TO PRODUCT BASED ON DIFFERENCES IN TYPE OF 2,4-D AND LABEL USE PATTERNS]

- *Release height is measured in the following ways:*
  - *Fallow uses: it is from the top of the target weeds (should be on the average height of weeds across the paddock)*
  - *In-crop uses: it is from the top of the crop canopy (when weeds are smaller than crop) or the top of the target weeds (when weeds are larger than crop)*

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Example buffer zones (Amicide Advance 700, ground spraying)

Application rate (/ha)	Downwind mandatory no spray zone	
	Aquatic	Terrestrial
Dryland cropping: winter cereals and fallows		
Up to 1.0 L	10 metres	10 metres
Up to 1.2 L	10 metres	10 metres
Up to 1.5 L	20 metres	20 metres
Dryland cropping: summer cereals		
Up to 1.0 L	10 metres	10 metres
Tropical & subtropical uses: Sugarcane		
Up to 1.5 L	20 metres	20 metres
Up to 3.1 L	30 metres	30 metres
Pasture		
Up to 2.85 L	30 metres	30 metres
Up to 3.9 L	35 metres	35 metres
Up to 4.75 L	45 metres	40 metres

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Additional information (only necessary if you have questions on what the APVMA instructions mean)

From APVMA consultation document:
https://apvma.gov.au/node/28071

Agricultural crops definition

‘Agricultural crops’ means any terrestrial plant species grown commercially for food or fibre production, with the following exception:

- Plants which are not part of a crop under management at the time of pesticide application (eg blackberries or volunteer grain plants which have escaped from a cropped area and become weeds in another area)

Aquacultural production definition

- ‘Aquacultural production’ means commercial production of any aquatic plant or aquatic animal species for food or ornamental purposes. This does not include those which are not part of an area of aquacultural production under management at the time of pesticide application (eg fish which have escaped into natural watercourses).

Buffer zone definition

A ‘buffer zone’ is an area where pesticide application does not occur between the application site and an identified sensitive area which is downwind from the application site. For boom and aerial spraying, a buffer zone is measured from the edge of the sprayer swath closest to the downwind sensitive area; for vertical spraying, a buffer zone is measured from half a row width (ie trees, vines, other plants) outside the application site closest to the downwind sensitive area

Landscaped gardens definition

‘Landscaped gardens’ means any terrestrial plant species grown for ornamental purposes on private or public land, or for domestic food production on private land, with the following exceptions:

- species that are declared noxious or invasive to the area of application by local, state or commonwealth legislation
- plants which are not part of a garden under management at the time of pesticide application (eg flowering plants which have escaped from a home garden and have become weeds in another area)

Native vegetation definition

‘Native vegetation’ means any terrestrial plant species native to Australia as defined under local, state or commonwealth legislation with the following exceptions:

- species that are declared noxious or invasive to the area of application by local, state or commonwealth legislation
- plants that the chemical user, or the person the chemical user is applying agricultural chemical product/s on behalf of, is legally allowed to remove under local, state or commonwealth legislation

Natural aquatic areas definition

‘Natural aquatic areas’ are where a ‘watercourse’ (as defined by the Commonwealth Water Act 2007) is present, with the following exceptions:

- artificial ‘watercourses’ used exclusively for agricultural or ornamental purposes, such as irrigation channels, flood irrigation areas, farm dams, ornamental ponds, golf course dams, those used for aquacultural production, etc.
- ‘watercourses’ that are dry at the time of pesticide application
- ‘watercourses’ that are commonly identified as ‘puddles’

Watercourse definiton

For the purpose of ‘natural aquatic areas’, the current definition of ‘watercourse’ under the Commonwealth Water Act 2007 is a river, creek or other natural watercourse (whether modified or not) in which water is contained or flows (whether permanently or from time to time); and includes:

- a dam or reservoir that collects water flowing in a watercourse
- a lake or ‘wetland’ through which water flows
- a channel into which the water of a watercourse has been diverted
- part of a watercourse
- an estuary through which water flows

A ‘wetland’ is an area of land where water covers the soil – all year or just at certain times of the year. They include:

- swamps, marshes
- billabongs, lakes, lagoons
- saltmarshes, mudflats
- mangroves, coral reefs
- bogs, fens, and peatlands.

A ‘wetland’ may be natural or artificial and its water may be static or flowing, fresh, brackish or saline.

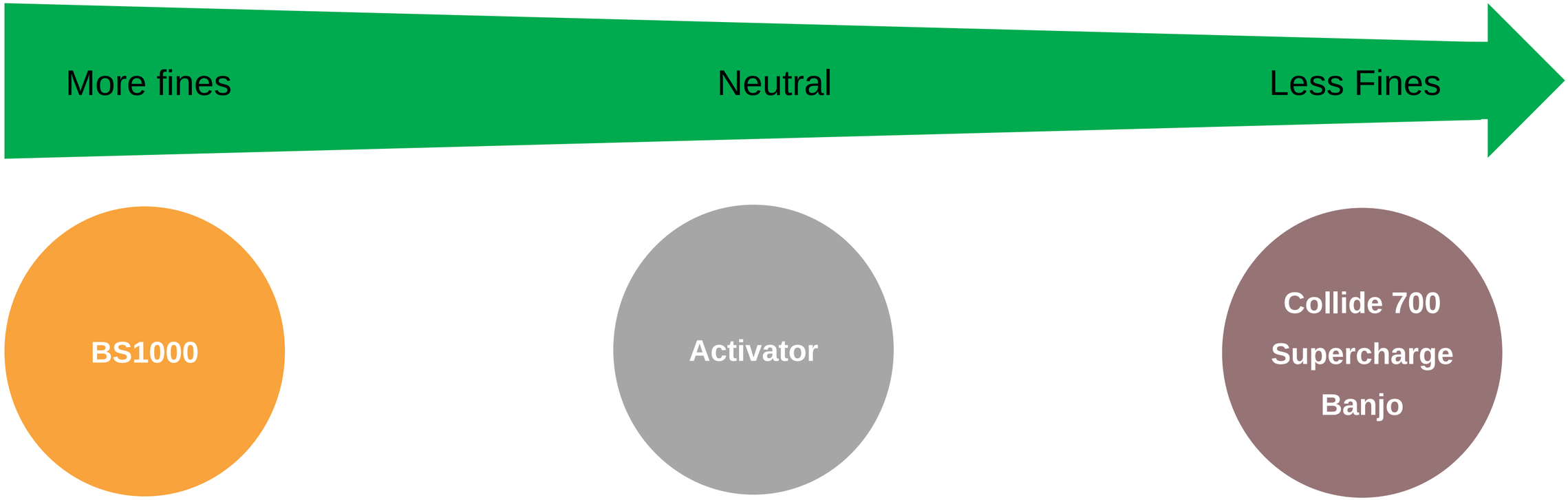
Spray cloud definition

‘Spray cloud’ means the volume of air that is directly adjacent to operating application equipment which contains large numbers of spray droplets in close proximity to each other. The area which the spray cloud covers will vary between types of application equipment and use practices, but is generally defined as the cloud of droplets which is visible by the naked eye shortly after being released into the atmosphere and excludes isolated droplets that are carried downwind from the application area by the wind.

Adjuvant impact on spray quality

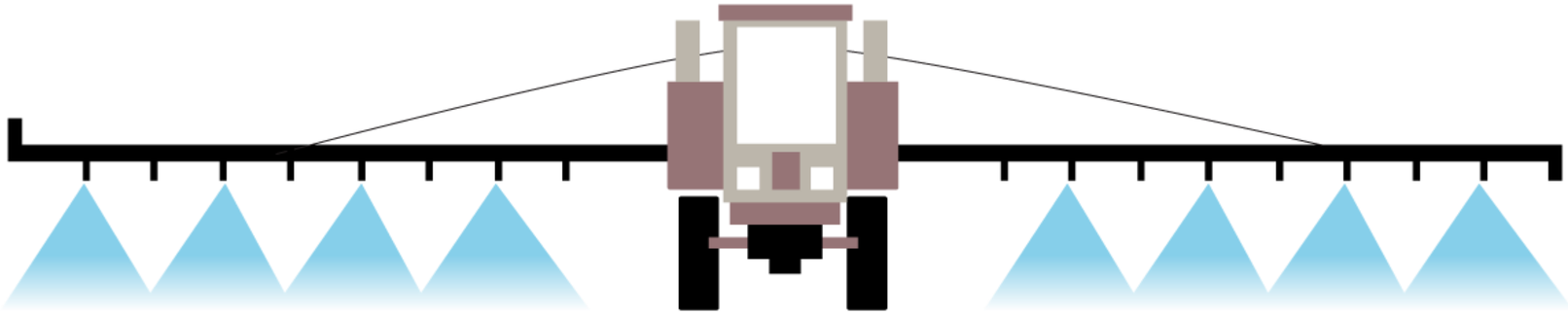
Nozzle choice and operating pressure have the greatest influence on spray quality.
If a 2,4-D product is being applied, nozzles that provide the specified spray quality must be used. Tank mixes do not change this requirement

Some adjuvants assist in reducing the amount of driftable fines (droplets <150 micron)



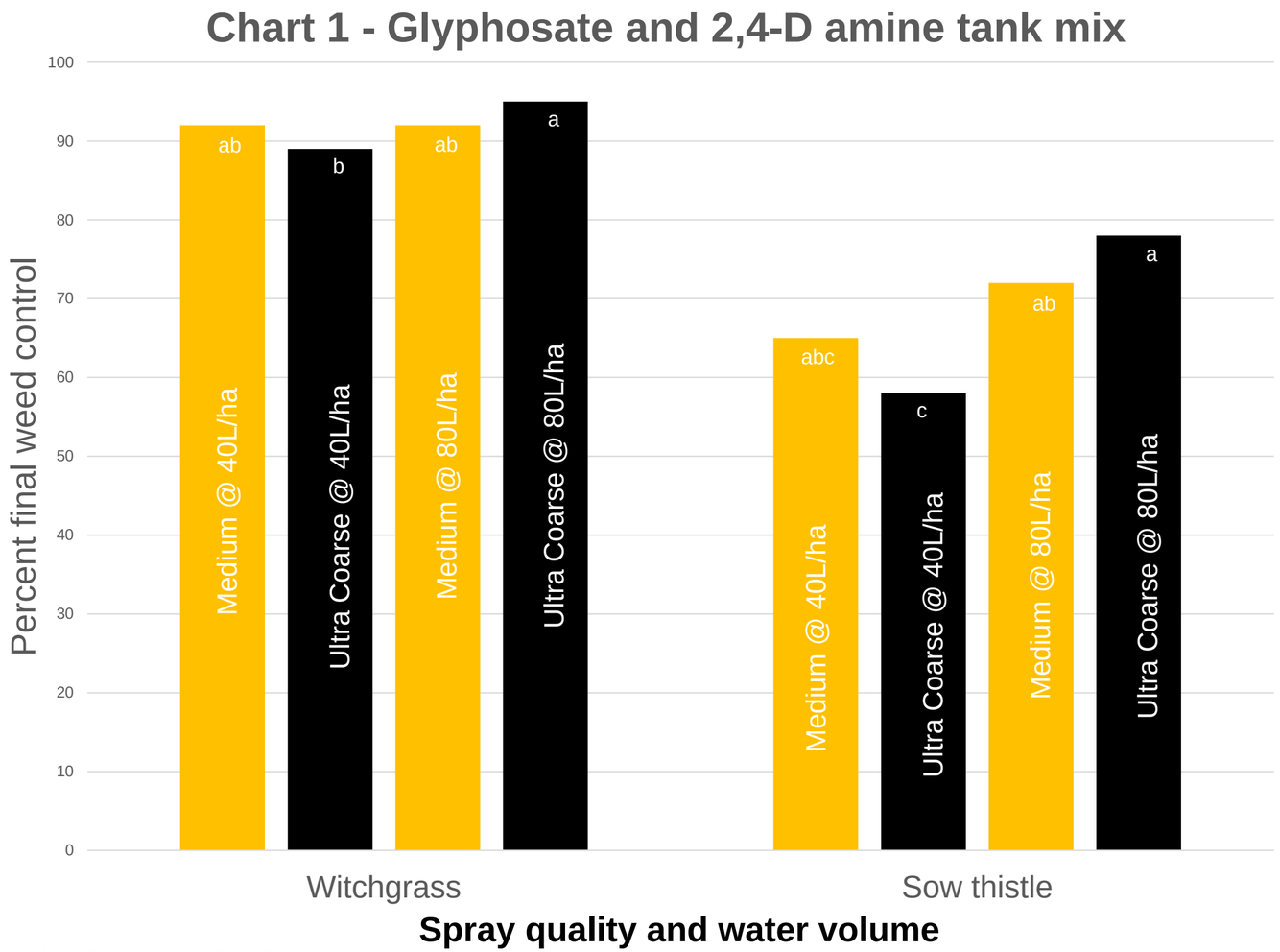
Our advice

- Use minimum of 80L/ha water volume & in heavy stubble increase to 100L/ha
- Keep speed to below 20km/hr
- Use robust product rates
- Use only recommended adjuvants
- Avoid spraying at night, use XC or UC if this is unavoidable
- Follow the advisory statements (Oct to Apr use XC or UC spray quality)



Effects of spray quality on weed control

Summer Fallow knockdown trial



- Increase water volume when using extremely coarse spray quality
- Systemic herbicides (glyphosate and 2,4-D) can be used successfully with extremely coarse spray quality
- *colour refers to spray quality – i.e yellow = medium

Trial reference: NUVC-11-37.01-H66
Herbicide rates = glyphosate at 540g ai/ha + 2,4-D amine at 230g ai/ha (herbicide rate was marginal for large weed size)
Witchgrass = *Panicum capillare* Sow thistle = *Sonchus oleraceus*

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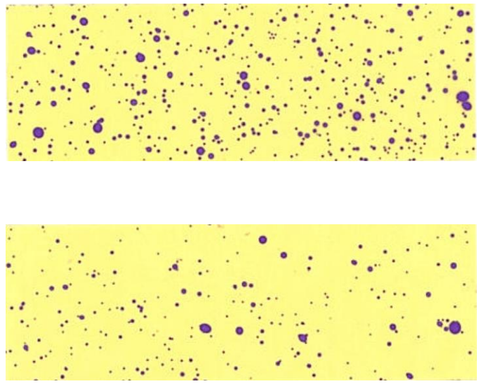
Effects of spray quality on weed control

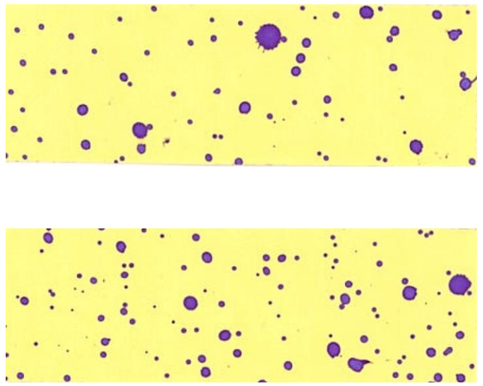
Spray coverage

Summer Fallow knockdown trial

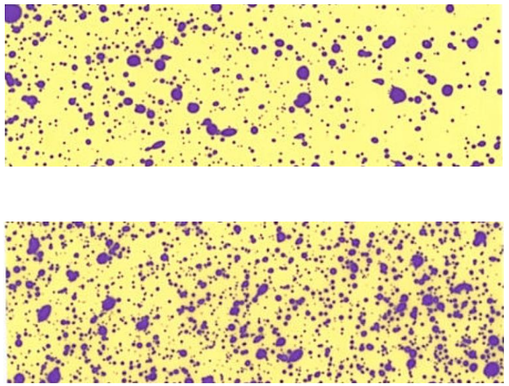
Agrotop Airmix 1102 @ 4 bar, 28km/hr, 40L/ha
MEDIUM



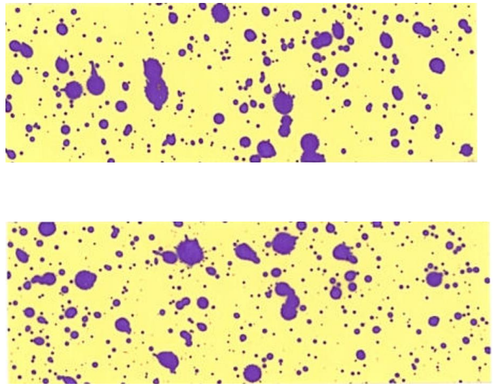
TeeJet TTI 11002 @ 4 bar, 28km/h, 40L/ha
ULTRA COARSE



Agrotop Airmix 1102 @ 4 bar, 14km/hr, 80L/ha
MEDIUM



TeeJet TTI 11002 @ 4 bar, 14km/h, 80L/ha
ULTRA COARSE



- Using higher water volumes improves spray coverage – particularly when using extremely coarse spray quality
- This water sensitive paper was taken from the summer fallow weed control trial - chart 1

Trial reference: NUVC-11-37.01-H66
Herbicide rates = glyphosate at 540g ai/ha + 2,4-D amine at 230g ai/ha (herbicide rate was marginal for large weed size)
Witchgrass = *Panicum capillare* Sow thistle = *Sonchus oleraceus*

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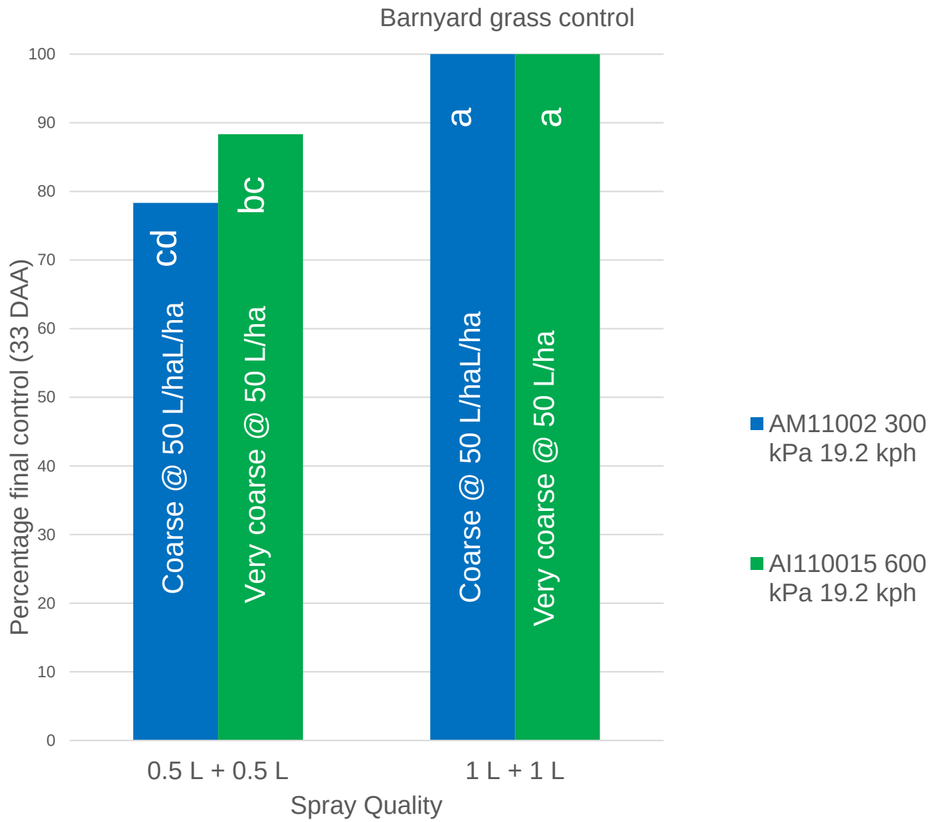
Effects of spray quality on weed control (Brookstead, SQld)

Summer Fallow knockdown trial

Glyphosate and 2,4-D amine tank mix



- Equivalent control of barnyard grass when robust rates used.
- Control with marginal rates will be influence by the spray quality

Trial reference: NSQ05-37-H16
Herbicide rates = glyphosate (540 g/L) + 2,4-D amine(300 g/L) at 0.5 N & N rates
Awnless barnyard grass (*Echinochloa colona*) 4-5 tillers 15 plants/m^2 , Bladder ketmia (*Hibiscus trionum*) – 10-20 cm high budding2 plants/m2

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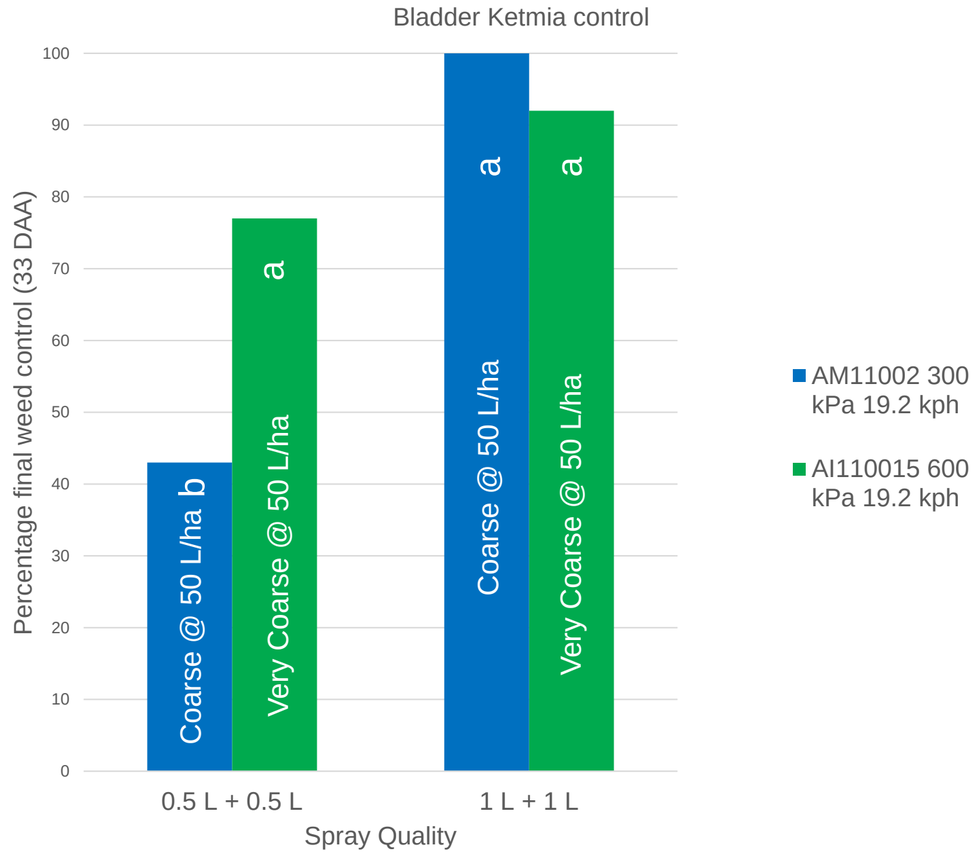
Effects of spray quality on weed control (Brookstead, SQld)

Summer Fallow knockdown trial

Glyphosate and 2,4-D amine tank mix



- Equivalent control of bladder ketmia
- Control with marginal rates will be influenced by the spray quality
- No significant difference in control between coarse and very coarse when applied at robust rates

Trial reference: NSQ05-37-H16
Herbicide rates = glyphosate (540 g/L) + 2,4-D amine(300 g/L) at 0.5 N & N rates
Awnless barnyard grass (*Echinochloa colona*) 4-5 tillers 15 plants/m^2 , Bladder ketmia (*Hibiscus trionum*) – 10-20 cm high budding2 plants/m2

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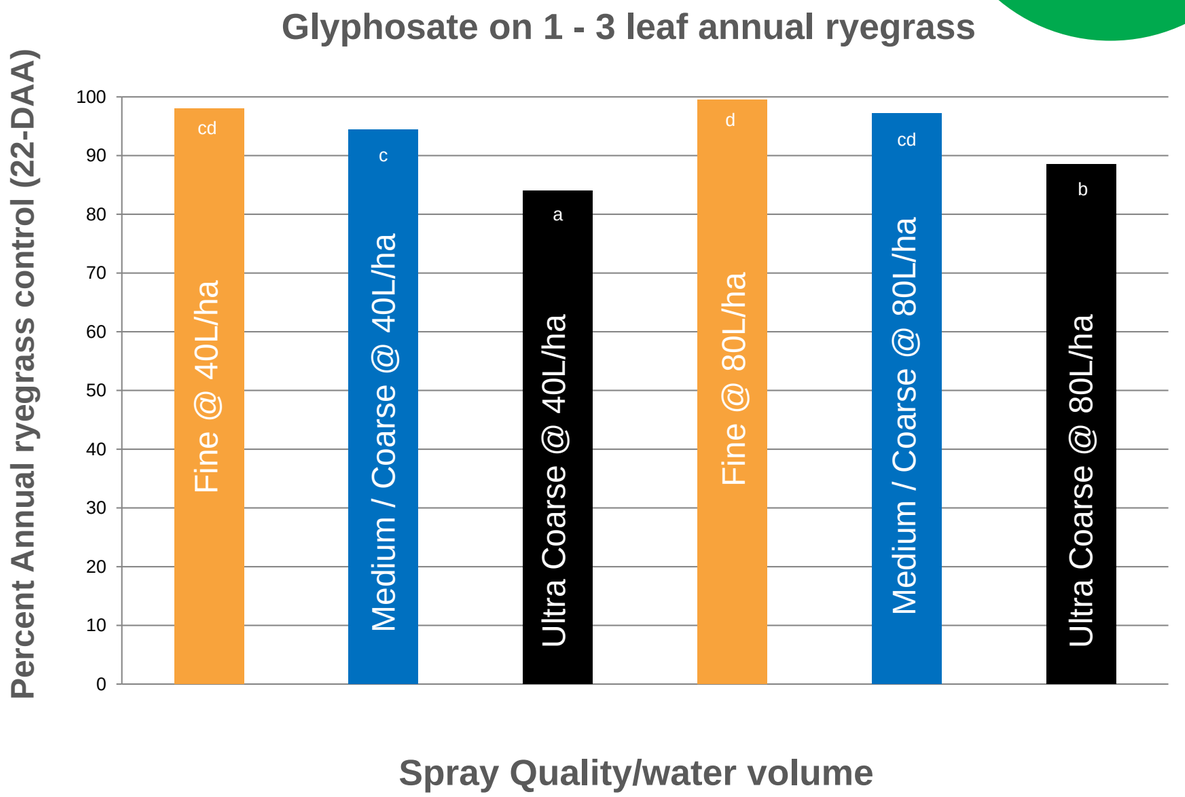
Effects of spray quality on weed control

Autumn knockdown trial

- Caution required with fine targets (i.e. young ryegrass) and heavy stubbles
- Use robust product rates
- See photos next page



Fine = TeeJet XR11002 @ 3.5 bar

Medium/Coarse = TeeJet AIXR11002 @ 3.5 bar

Ultra coarse = TeeJet TTI11002 @ 3.5 bar

40L = 25km/hr, 80L = 13km/hr

Trial reference: NUVC-09-37.01-H21
Herbicide rates = glyphosate at 320g ai/ha (herbicide rate was marginal/off label for comparative purposes)
Annual ryegrass = *Lolium ridgidum*

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Effects of spray quality on weed control results (22 days after application)

Autumn knockdown trial

40 L/ha water volume treatments:

Fine

Coarse

Ultra Coarse

Trial reference: NUVC-09-37.01-H21
Herbicide rates = glyphosate at 320g ai/ha (herbicide rate was marginal/off label)
Annual ryegrass = *Lolium ridgidum*

Percentage of spray volume below 150 Micron

Spray Quality	Approximate microns
Fine	- 40-50% less than 150 microns
Medium	- 20% less than 150 microns
Coarse	- 10% less than 150 microns
Very Coarse	- 5% less than 150 microns
Extremely Coarse	- <2-3% less than 150 microns
Ultra Coarse Spray	- < 1% less than 150 microns

Key points

- Droplets less than 150 micron are classified as driftable fines
- Droplets Less than 150 micron are not likely hitting the target weed

More information

For more information, see:

- GRDC Summer Fallow Spraying Fact sheet here
- GRDC Nozzle design and function here
- GRDC spray Application manual sheet here

For more information, visit https://www2.nufarm.com/au/2018/10/09/new-apvma-spray-drift-instructions-for-24-d-products

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