

Using On Coarse® DRA to reduce the risk of drift with knockdown herbicide application.

Background

Paraquat is a very commonly used knockdown herbicide in a wide range of cropping situations across Australia. As a contact herbicide, its performance is very dependent on the spray coverage achieved from the application process. Usually applicators use a medium spray quality to achieve the best perceived coverage. Indeed, the generic paraquat label advises the use of nozzles “designed to give droplets in the 200 to 250µm Volume Median Diameter range” when using pressures of 2 – 3 bar.

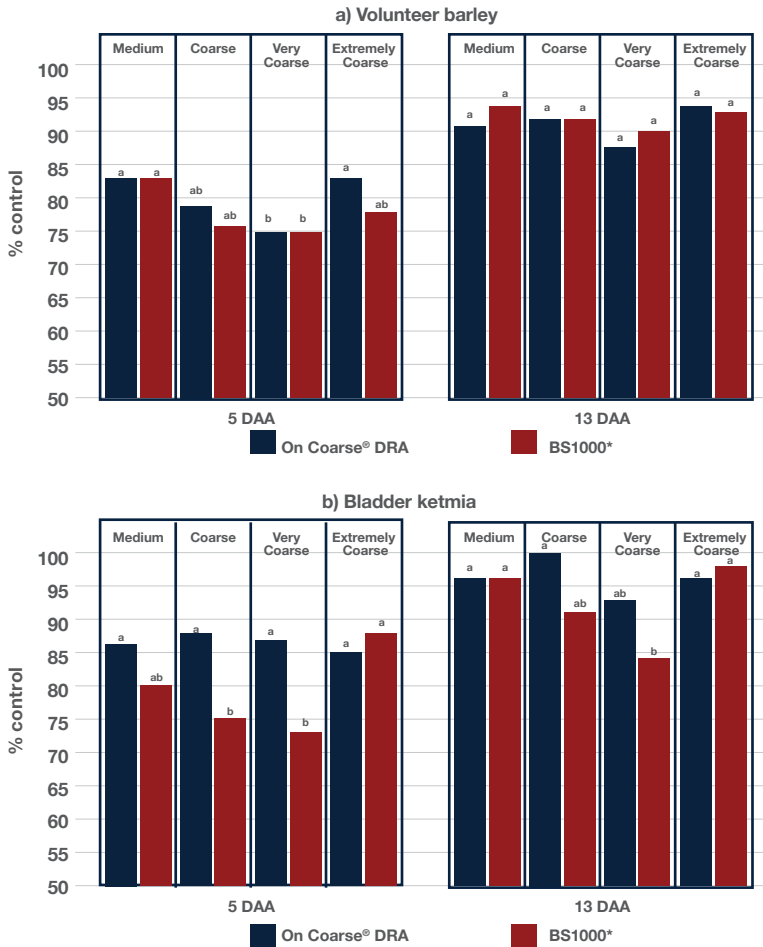
Given that droplets smaller than 200µm are by definition fine droplets when booms are 1m above the ground or stubble, following this approach ensures almost 50% of the spray volume is drift prone. Being so small, the momentum fine droplets have out of the nozzle is depleted within about 75cm - after which they are moved by wind. This means that if 1.4L/ha was the application rate, 700ml/ha is relying on a co-operative wind to get it to the target. Clearly, the drift risk of using these application parameters is very high.

FMC has continued to assess its drift reduction adjuvant (DRA), On Coarse® DRA, using low drift risk approaches to applying knockdown herbicides – paraquat and glyphosate, in particular. The Northern Grower Alliance (NGA) has also been assessing “the efficacy cost of drift reduction” more broadly in projects over the past few years. Their focus was on haloxyfop, another herbicide for which a medium spray quality is usually advised.

The results of this trial series show that On Coarse® DRA can be substituted for the usual adjuvant when using any spray quality without compromising efficacy. They further show that by selecting spray qualities at the coarser end of the options - and using On Coarse® DRA - a good weed control outcome can be achieved when taking a best management approach to low drift risk when applying knockdown herbicides.



Trial 1 - The effect of spray quality and adjuvant on control of Volunteer barley and Bladder ketmia with Gramoxone* 360 PRO



Trial 1: FMC-56b-01, Allora Qld, 2022

Herbicide: Gramoxone* 360 PRO 1.4L/ha

Small plot RCB 4 reps

Application: Hand held boom

Spray volume: 100L/ha

Adjuvants:

- On Coarse® DRA 0.25% v/v
- BS1000* 0.2%v/v

Nozzles:

- Airmix 01 3 bar (M)
- Bubblejet 01 3 bar (C)
- Injet 015 3 bar (VC)
- Airmix 015 2 bar (XC)

Weeds:

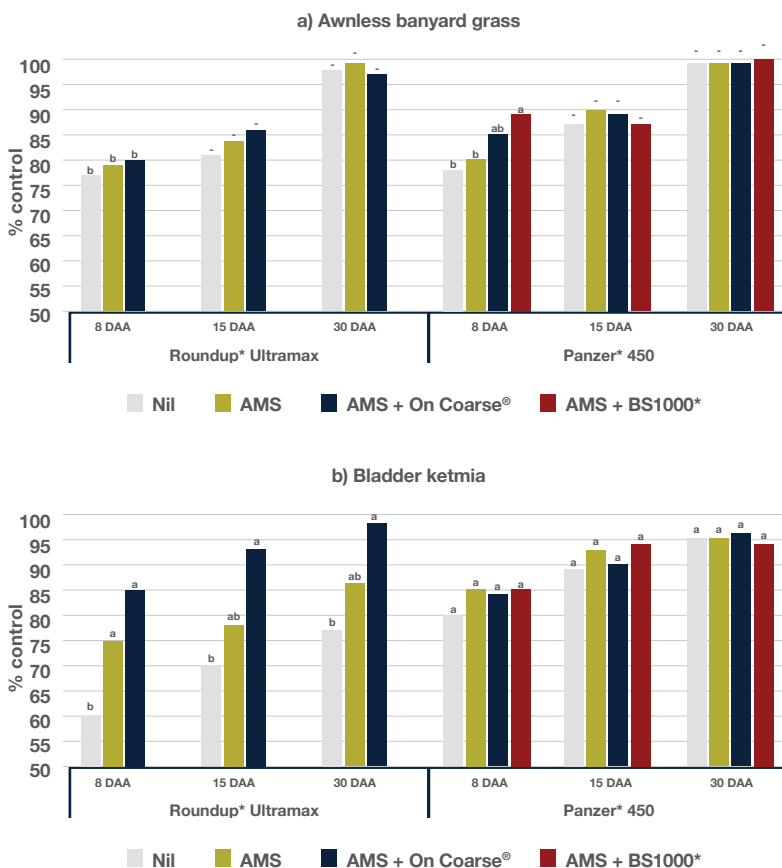
- Volunteer barley (GS 12 -21)
- Bladder ketmia (4-6 leaf)

Assessments: 5 DAA; 13 DAA

Key points:

- On Coarse® DRA was every bit as effective as BS1000* as an adjuvant of Gramoxone* 360 PRO against both grass and broadleaf weeds.
- With On Coarse® DRA as the adjuvant, Gramoxone* 360 PRO gave more rapid broadleaf knockdown with both coarse and very coarse spray qualities compared to BS1000*.
- The efficacy of paraquat was not affected by using even an extremely coarse spray quality.

Trial 2 - On Coarse® DRA is an effective adjuvant of glyphosate



Trial 2: 58b-Jubilee-21-01, Pilton Qld, 2021

Herbicide:

- Roundup* UltraMax 1.2L/ha
- Panzer* 450 1.52L/ha

Small plot RCB 4 reps

Application: Hand held boom

Spray volume: 100L/ha

Adjuvants:

- BS1000 0.2%v/v
- Liquid Assist 2% v/v (AMS)
- On Coarse® DRA 0.25% v/v

Nozzle: Minidrift 015 2.5 bar (Coarse spray quality)

Weeds:

- Awnless banyard grass (AWB) (>5 tiller)
- Bladder ketmia (bud-flower)

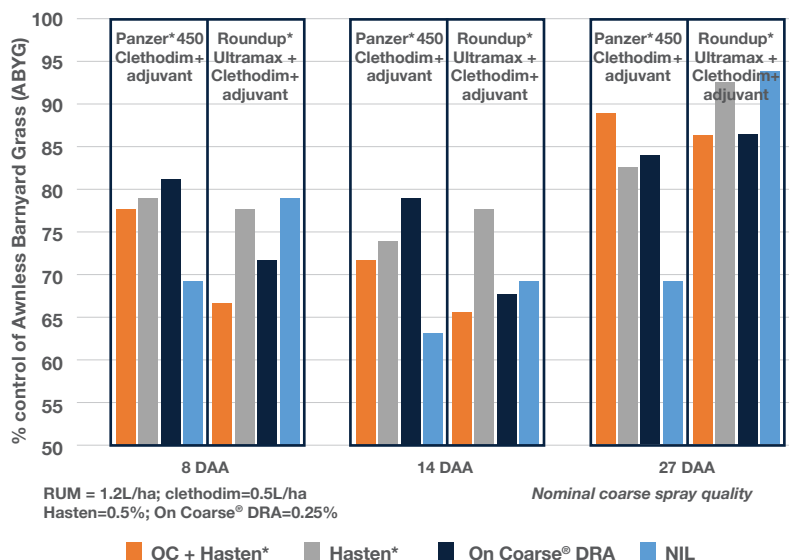
Assessments: 10DAA; 15DAA; 30DAA

Key points:

- On Coarse® DRA provided equivalent control of Awnless banyard grass and Bladder ketmia in a tank mix with Panzer* + AMS when compared to the commercial standard adjuvant BS1000*.
- The addition of On Coarse® DRA to Roundup* Ultramax + AMS enhanced final control of Bladder ketmia.
- Whilst the adjuvancy of On Coarse® DRA was equivalent to BS1000* when applied in a coarse spray quality, On Coarse® DRA has the added benefit of further reducing driftable fines.

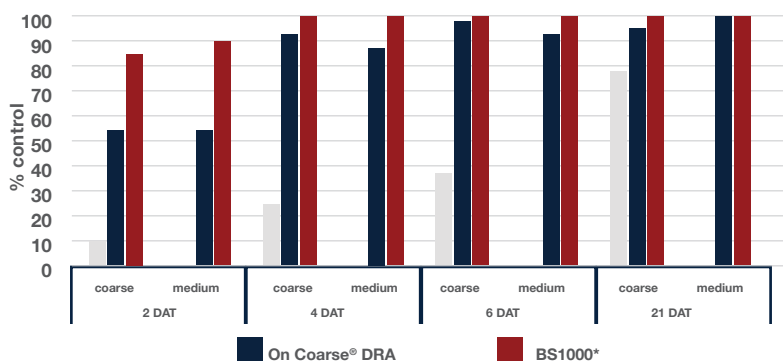
Trial 3 - Using On Coarse® DRA in Mixtures of Glyphosate and Clethodim

Use of On Coarse® DRA as the adjuvant in mixtures of glyphosate and clethodim

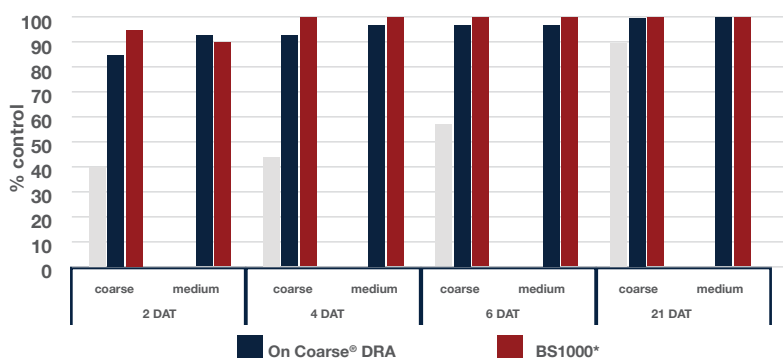


Trial 4 - The effect of spray quality and adjuvant on the control of 2 leaf Annual ryegrass with paraquat

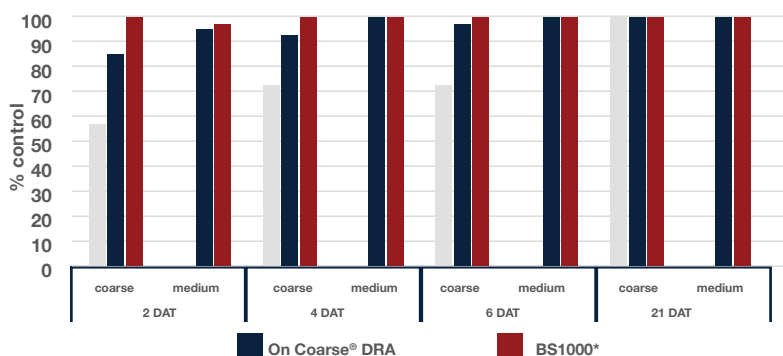
a) 600mL/ha Gramoxone® 360 Pro



b) 900mL/ha Gramoxone® 360 Pro



c) 1200mL/ha Gramoxone® 360 Pro



Trial 3: FMC-58-Jubilee-21-01, Millmerran Qld, 2021

Herbicide:

- Roundup* UltraMax 1.2L/ha
- Grasidim* (Clethodim) 0.5L/ha
- Panzer* 450 1.52L/ha

Small plot RCB 4 reps

Application: Hand held boom

Spray volume: 100L/ha

Adjuvants:

- Hasten* 1%v/v
- On Coarse® DRA 0.25% v/v

Nozzles: Minidrift 015 2.5 bar (Coarse spray quality)

Weeds: Awnless barnyard grass (1-8 tillers)

Assessments: 8 DAA; 14 DAA; 27 DAA

Key points:

- Overall, substitution of On Coarse® DRA for Hasten* did not appear to adversely affect performance of either Roundup* UltraMax or Panzer* 450 when combined with Grasidim*.
- There were no measured significant differences between treatments. In terms of trends:
 - the Roundup* Ultramax/clethodim mix performed better with Hasten* while the Panzer* 450/clethodim mix benefited more from On Coarse® DRA
 - the effect of adjuvant type depended on the individual glyphosate formulation
 - there was no benefit in mixing Hasten* with On Coarse® DRA.

Trial 4: FMC-50-Busi UWA 22, UWA, 2022

Herbicide: Gramoxone® 360 PRO 0.6, 0.9 and 1.2L/ha

Bioassay 4 reps

Application: Track sprayer single nozzle (3km/hr)

Spray volume: 100L/ha

Adjuvants:

- BS1000* 0.2%v/v
- On Coarse® DRA 0.25% v/v

Nozzles:

- Lechler IDK120 01 2 bar (C)
- Airmix 01 2 bar (M)

Weeds: Annual ryegrass (1-2 leaf)

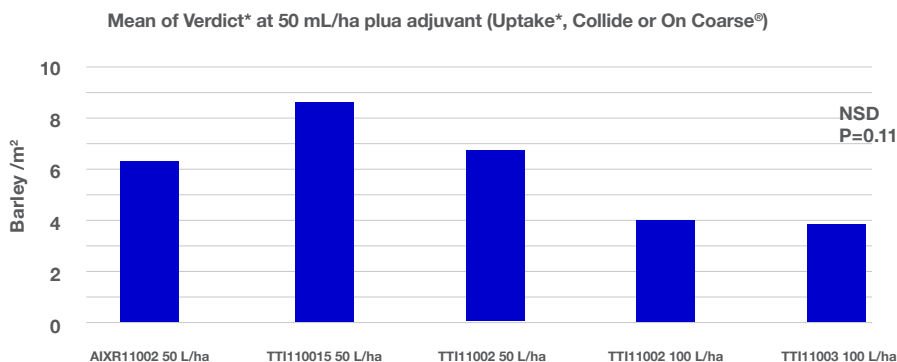
Assessments: 2 DAA; 4 DAA; 6 DAA; 21 DAA

Key points:

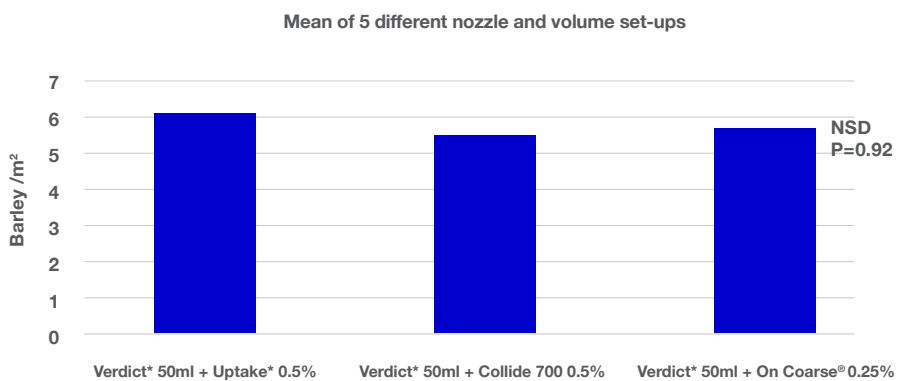
- Applying paraquat with a coarse spray quality and with On Coarse® DRA as adjuvant did not result in reduced final control or slower burndown of ARG compared to using a medium spray quality and BS1000* as adjuvant if at least 900ml/ha of Gramoxone® 360 PRO was used.
- Accompanying spray card analysis (not shown) confirmed many more fine droplets being produced when BS1000* was used with either the medium or coarse nozzles compared to On Coarse® DRA. The coarser spray quality produced when On Coarse® DRA was used, did not affect final control of Annual ryegrass.
- This trial demonstrates that effective control of Annual ryegrass can be achieved with Gramoxone® 360 PRO using a coarse spray quality, with the addition of On Coarse® DRA

Trial 5 (Northern Grower Alliance Trial)

Impact of nozzles and application volume on efficacy
Narrabri 26 DAA - March 2022



Impact of adjuvants on efficacy
Narrabri 26 DAA - March 2022



Trial 5: NGA - Efficacy impact of spray drift reduction 21/22, Narrabri NSW, 2022

Herbicide: Verdict* 50ml/ha

Small plot RCB 4 reps

Application: ATV boom application 10-21km/h

Spray volume: 50L/ha and 100L/ha

Adjuvants:

- Uptake* 0.5%v/v
- Collide 0.5%
- On Coarse® DRA 0.25% v/v

Nozzles:

- AIXR 02 4 bar (M)
- TTI 015 4 bar (XC)
- TTI 02 4 bar (UC)
- TTI 03 4 bar (UC)

Weeds:

- Volunteer barley (GS 12 -21)

Assessments: 26 DAA

Key points:

- When all common nozzle/vol results were pooled, the spray quality, within these parameters, did not affect the efficacy of haloxyfop
- With all adjuvant results pooled, Verdict* efficacy against Volunteer barley with On Coarse® DRA as adjuvant was the same as with the other adjuvants

For further information please visit www.fmccrop.com.au

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