CONTROLLING DIFFICULT FALLOW WEEDS
Feathertop Rhodes, Fleabane and Barnyard Grass

KEY POINTS

- Use Enhance in mixtures with glyphosate to reduce drift and improve coverage
- Use Plantocrop in mixtures with GRP A herbicides and the paraquat double knock to improve leaf uptake

APPLICATION PRINCIPLES FOR SUMMER FALLOW SPRAYING

Adjuvants can greatly assist in improving the performance of summer fallow herbicides by:

1. Increasing droplet size – to reduce drift and the risk of off- target damage, whilst still providing good coverage. It is particularly important to understand which adjuvants increase droplet size and which will decrease it and what the herbicides inbuilt formulation adjuvant will do to droplets.
2. Increase the rate of droplet survival on the leaf – to enable the active ingredient time to penetrate.
3. Increase the rate of uptake into the leaf, by assisting movement through leaf surfaces into plant cells.
4. Improve the mixing compatibility of multiple products in often poor quality water.
5. Work with a wide range of herbicides on both broadleaf and grass weeds.
6. Be cost effective and work at a range of application volumes.

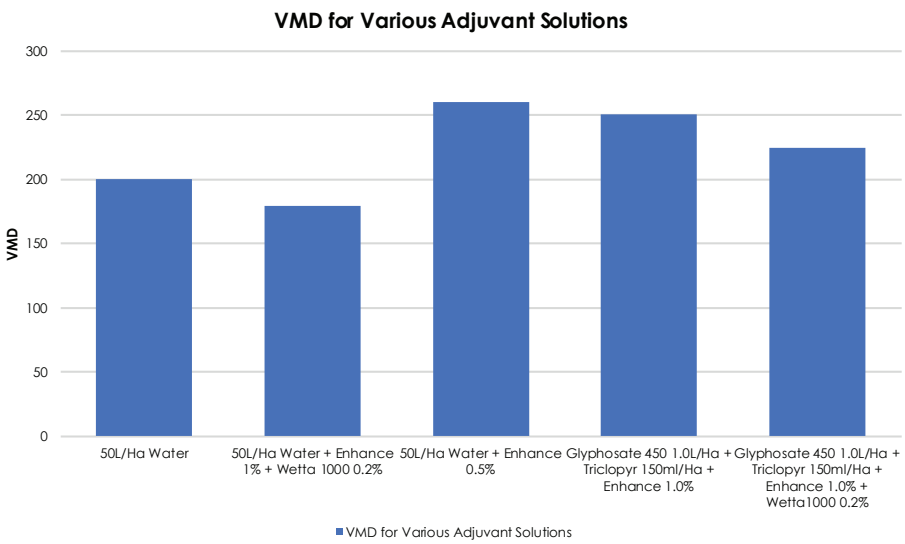
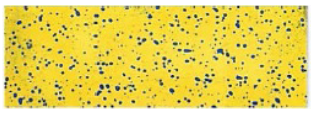


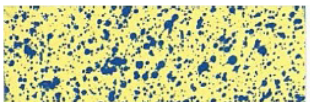
Chart 1: The addition of Enhance increases the VMD in spray solutions whilst non-ionic surfactants such as Wetta 1000 can decrease the VMD
Source: USDA droplet survival study SACOA May 2014

DROPLET SIZE

Maintaining correct droplet size is crucial to reduce drift and ensure good coverage on target leaf surfaces. Nozzle and adjuvant type, operating pressure, travel speed and environmental conditions all impact on droplet size. Enhance will increase overall droplet size and reduce the number of small driftable droplets. In contrast, non-ionic surfactants will reduce droplet size and increase drift. Glyphosate and many paraquat formulations contain inbuilt non-ionic surfactants – so using them without an oil-based adjuvant can cause drift issues and efficacy loss.



WATER
7.5% Coverage, 19% Predicted
VMD 150um, Spray Quality (Fine)



ENHANCE®
26.8% Coverage, 28.6% Predicted
VMD 350um, Spray Quality (Coarse)

Figure 4: Spray coverage of various adjuvant types in a typical summer herbicide mixture with AI110015 nozzels @ 3Bar and 100L/Ha water. Temp: 30.4oC, RH 32%, Wind speed 11.0km/Hr, Delta T 11.5 Coverage analysis using Snapcard® water sensitive paper analysis app. *(Source: SACOA internal trial December 2014).*

DROPLET SURVIVAL

Once a spray droplet reaches a target surface – droplet survival becomes critical in ensuring herbicide actives are able to penetrate through the leaf surface get to their site of activity within the cell.

Methylated seed oils such as Plantocrop are excellent for assisting leaf surface penetration, particularly in mixtures with GRP A's and paraquat.

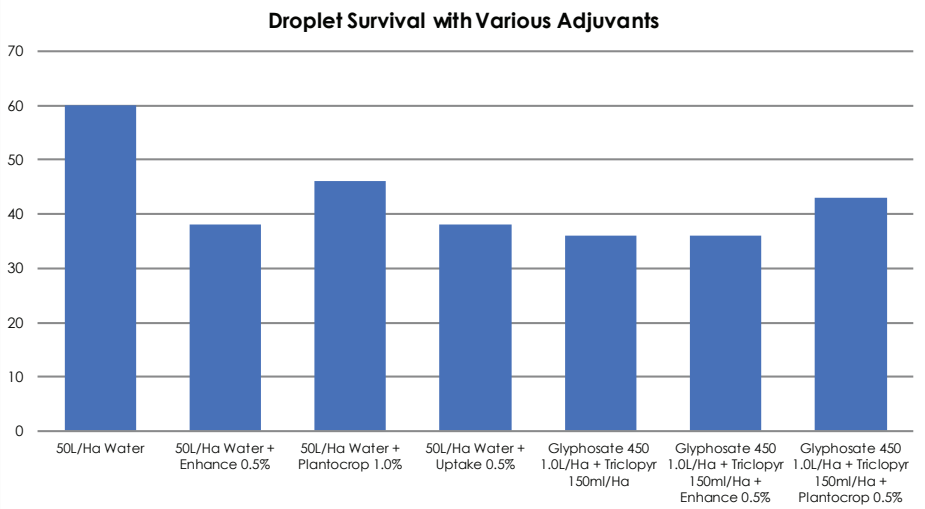


Chart 2: Adjuvants such as Enhance and PLANTOCROP increase the droplet survival time on leaf surfaces, enabling time for the active ingredient to enter. Source: USDA droplet survival study SACOA May 2014

ENHANCE

SACOA's mineral oil based adjuvant, Enhance, has become the fallow spraying adjuvant of choice in many cropping areas – offering the benefits of:

- Flexibility to mix with all herbicides including glyphosate and paraquat for the double knock.
- No impact on spray mix pH – important for newer herbicide actives such as saflufenacil.
- Over twenty years of proven results under local Australian conditions.
- Ongoing product support including up to date information on new weeds and actives.
- Made in Australia, by a fully Australian owned, agriculture focussed company.

PLANTOCROP

SACOA's methylated seed oil based adjuvant, Plantocrop, is ideal for use with GRP A herbicides such as clethodim and haloxyfop which are becoming increasingly important for managing grasses such as Feathertop Rhodes and Barnyard grass, particularly where glyphosate resistance is a concern. GRP A's are classified as lipophilic and are therefore relatively slow at entering into leaves. Plantocrop increases the rate of GRP A leaf uptake particularly through cuticle and wax layers. When used as an adjuvant with paraquat in the double knock, Plantocrop will improve leaf surface coverage by reducing drift and facilitating leaf uptake. The double knock should always be applied within 7-10 days of the initial GRP A application, to ensure enough time for GRP A translocation but before any weed recovery can start. Be aware also that a double knock is a legal requirement of using GRP A's in a fallow situation.

FLEABANE CONTROL - KEY FINDINGS

- In glyphosate tank mixes with Ester, mineral oils, such as Enhance at 1%, assist with drift reduction and improved droplet survival. They also provide a balance between leaf surface coverage and penetration, enabling effective coverage and translocation.
- Glyphosate activity can be reduced by the presence of Ca and Mg ions in hard water. The addition of Ammonium Sulphate will help alleviate this.
- A double knock within 7-10 days of the initial application can double the efficacy of the initial treatment and prevent seed set.
- On difficult to control, stressed weeds, a penetrant type seed oil such as Plantocrop at 1% proved the most effective mix partner with paraquat in the double knock, particularly if using glyphosate spikes such as Sharpen or carfentrazone.

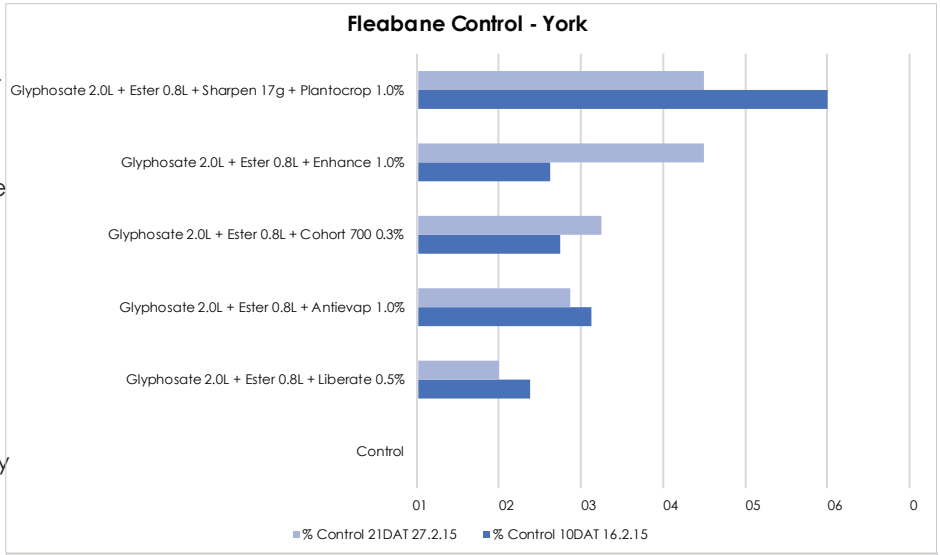


Chart 3: Source: T. Boyes AgVivo Agronomy, York Feb 15

FEATHERTOP RHODES - KEY FINDINGS

- Mixtures of the GRP A herbicides, clethodim & haloxyfop, proved more effective than glyphosate or clethodim alone. Overreliance on this group should be avoided however, due to the risk of resistance development.
- A mineral oil, such as Enhance at 0.5%, or esterified seed oil, such as Plantocrop @ 1%, were the best adjuvant options for both glyphosate and the GRP A's.
- The addition of haloxyfop to glyphosate doubled the efficacy of glyphosate alone.

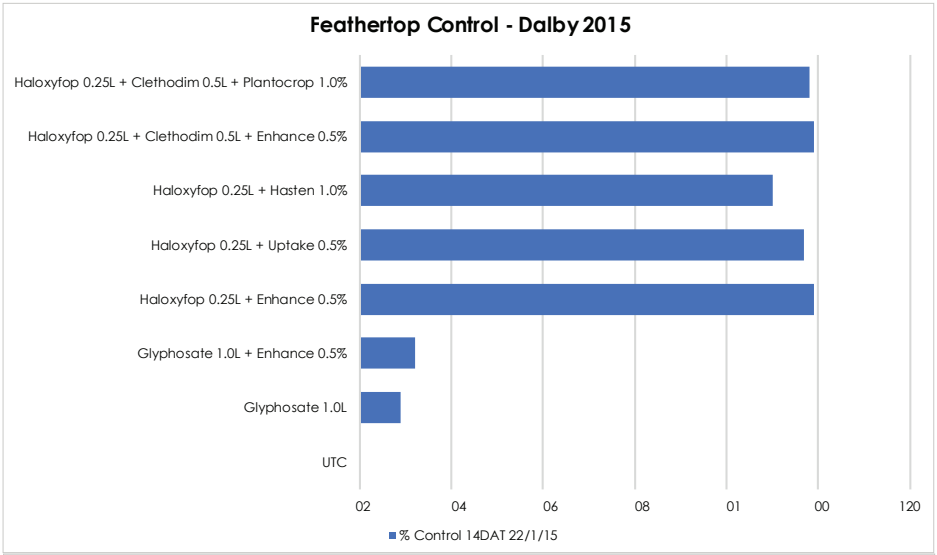


Chart 4: Source: Kalyx Dalby 12/2/2015 (KA14-1041 Adjuvants and Oils for summer fallow weed control)

BARNYARD GRASS CONTROL - KEY FINDINGS

- Many glyphosate formulations, particularly 450g/L concentrations, contain an inbuilt non- ionic surfactant which assists leaf surface spreading, but can also increase drift by reducing droplet size.
- Group A herbicides require a leaf surface penetrant for uptake. Plantocrop @ 1% proved most effective in this work.
- The addition of Enhance at 1.0% significantly improved the activity of Paraquat and Glyphosate Flame mix.

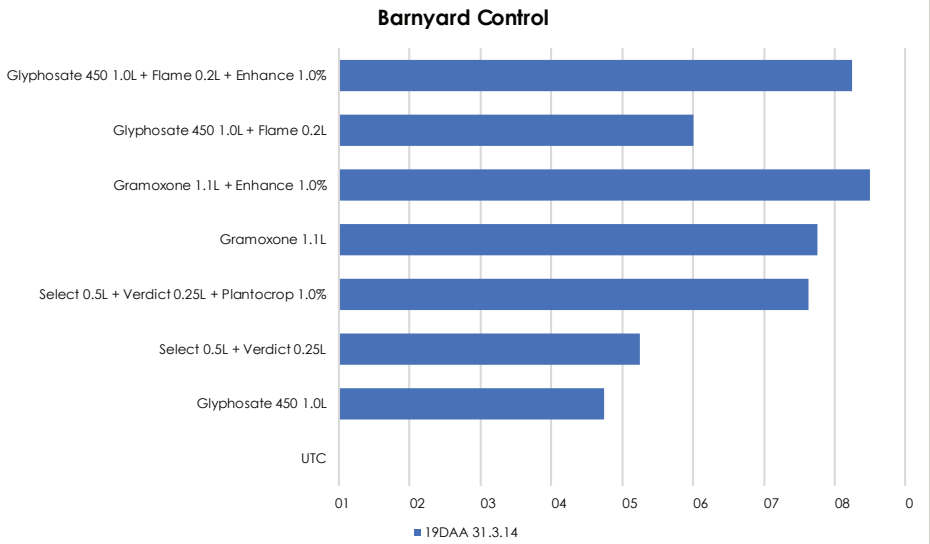


Chart 5: Source: Kalyx 13.5.2014 - KA13-828 Control of Awnless Barnyard Grass Narrabri

TAKEAWAY MESSAGES

- For the majority of difficult fallow weed control situations which include glyphosate, an emulsifier loaded mineral oil such as Enhance, provides the best balance of droplet survival, leaf surface coverage and penetration, resulting in more complete weed control.
- In a paraquat double knock, under difficult conditions or on stressed weeds, an emulsifier loaded mineral oil such as Enhance will improve the effectiveness of the double knock.
- Group A herbicides are slow to enter leaf surfaces, esterified seed oils with penetrant properties such as Plantocrop are effective at assisting these modes of action.

REFERENCES

- QDPI – Management of flaxleaf
- fleabane – S.Walker 2007
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- NGA – Weeds & Resistance – considerations for awnless barnyard grass etc – R. Daniel 2015
- NGA – Fallow management of grass weeds – R.Daniel 2014
- Cotton CRC – Managing herbicide resistant barnyard grass – S. Maas – 2015

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