

SELECT CORRECT ADJUVANT FOR EFFECTIVE SUMMER WEED CONTROL

TECH NOTE SERIES



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KEY POINTS

- Droplet survival on leaf surfaces is a key determinant of herbicide efficacy
- ANTI-EVAP® and ENHANCE® improve droplet survival and final herbicide efficacy
- ANTI-EVAP® and ENHANCE® have been proven superior to LI700 in Triclopyr, Glyphosate & LVE mixes for melon control.

Recent rainfall across much of the western winter cropping areas, has resulted in good soil moisture profiles. As a result effective summer weed control programs will be essential to maintain yield.

Timing of application is critical for effective control and as most summer weed herbicides provide little residual activity, controlling later germinations depends on stopping seed set.

Whether you decide to spray early or late, adjuvant selection is critical to the performance of most active ingredients.

Adjuvants improve herbicide efficacy by reducing evaporation and drift, increasing droplet survival on leaf surfaces and increasing penetration of herbicide active ingredients into the plant.

Which of these is best suited to your needs depends on the active ingredient being used, the weed spectrum and stage, water volume, desired droplet size, spraying conditions and timing of the year, which may require the use of a particular type of adjuvant.

SACOA's ANTI-EVAP® is excellent at improving the efficacy of most summer fallow herbicides such as Triclopyr and/ or Glyphosate.

An acidifying surfactant such as COHORT 700® may be of use as a buffering agent if water quality is poor, otherwise provides little benefit in improving droplet survival and penetration.

SPRAY COVERAGE AND DROPLET SURVIVAL

The final efficacy of a herbicide results from the active ingredient getting from the nozzle into the plant for translocated herbicides or onto the leaf surface for contact herbicides. In most cases herbicides are sprayed out using water as a carrier and an adjuvant to improve this process.

Droplet survival on the leaf surface is an important indicator of herbicide efficacy, and is influenced by three key factors

- Environmental loss through drift and evaporation influenced by temperature and humidity, travel and wind speed, droplet size and viscosity of spraying liquid. Generally measured using Delta T, volume median diameter of droplets (VMD) and leaf coverage (see Chart 1).
- Evaporation and run-off loss once droplets have landed on leaf surface
- Rate of absorption through the leaf surface as a result of penetration

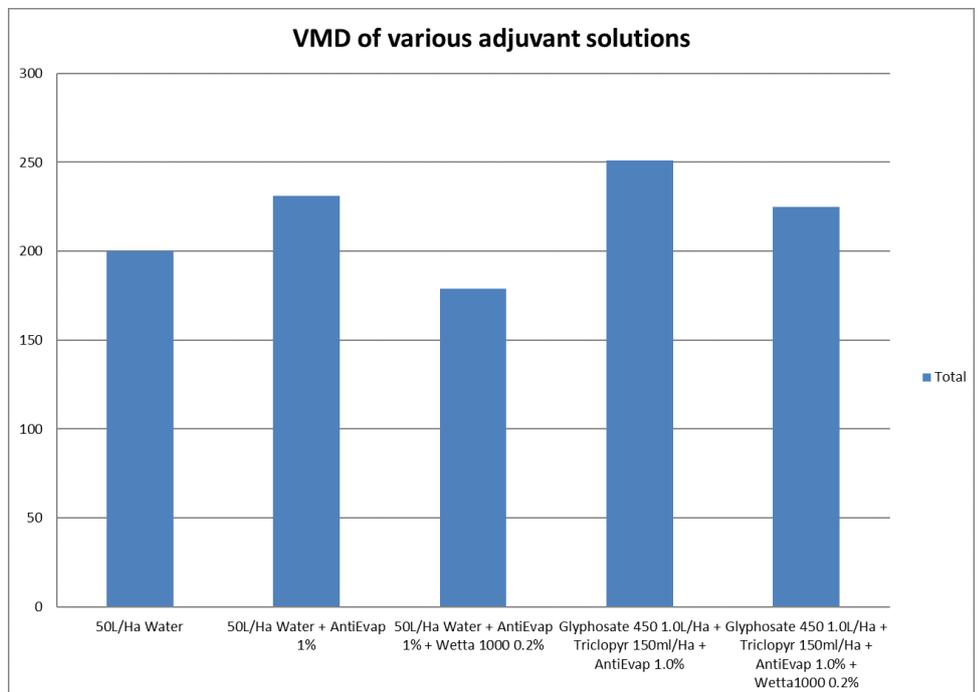


Chart 1: Oil based adjuvants such as ANTI-EVAP® have a positive effect on increasing droplet size versus non-ionic surfactants. (Source: USDA 2014)

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DIFFERENCES BETWEEN ADJUVANTS TYPES

Adjuvants have an important role in improving herbicide efficacy by;

- Protecting the active ingredient from drift and evaporative losses
- Improving the coverage on the target surface and facilitating uptake through the leaf surface.

Oils and adjuvants can be split into two broad types - penetrants and spreaders.

Penetrants

Penetrants have properties which break down waxy leaf surfaces, allowing the active ingredient to enter the plant faster. They are generally plant or mineral oil based and due to their higher viscosity have the ability to increase droplet size or Volume Median Diameter (VMD) (see Chart 1).

Many grass selective herbicides such as the Group A's are very poor on their own at entering leaf surfaces, particularly if they are waxy like ryegrass, but are translocated once inside the plant.

Hence most are labelled to be used in conjunction with an oil based penetrant adjuvant, where leaf surface coverage is not as critical as penetration.

Spreaders

Most spreading type adjuvants are surfactant based, which work by reducing the surface tension of liquids and thereby improve coverage on the leaf surface. Improved coverage is important for non-translocated herbicides such as paraquat, which work on contact and don't need to enter through the leaf surface.

As a result of reduced surface tension, surfactants can decrease droplet size and increase drift. This may result in increased runoff of the active ingredient from the leaf surface, particularly fine leaf grasses, which may result in reduced efficacy (see Chart 1).

Role of Adjuvants in Melon Control

A 2012 trial conducted by AgSense at Goomalling examined the effect of time of day on herbicide efficacy and the efficacy of ANTI-EVAP®, LI700 and ENHANCE® in some commonly used melon control mixtures.

The trial found;

- ANTI-EVAP® and ENHANCE® proved superior to LI700 in Triclopyr & LVE mixtures.
- ENHANCE® proved superior to LI700 in Triclopyr, Glyphosate & LVE mixtures.
- Time of day did not affect the performance of ANTI-EVAP® and LI700.
- The Untreated Control had >300 surviving melons 3WAA.

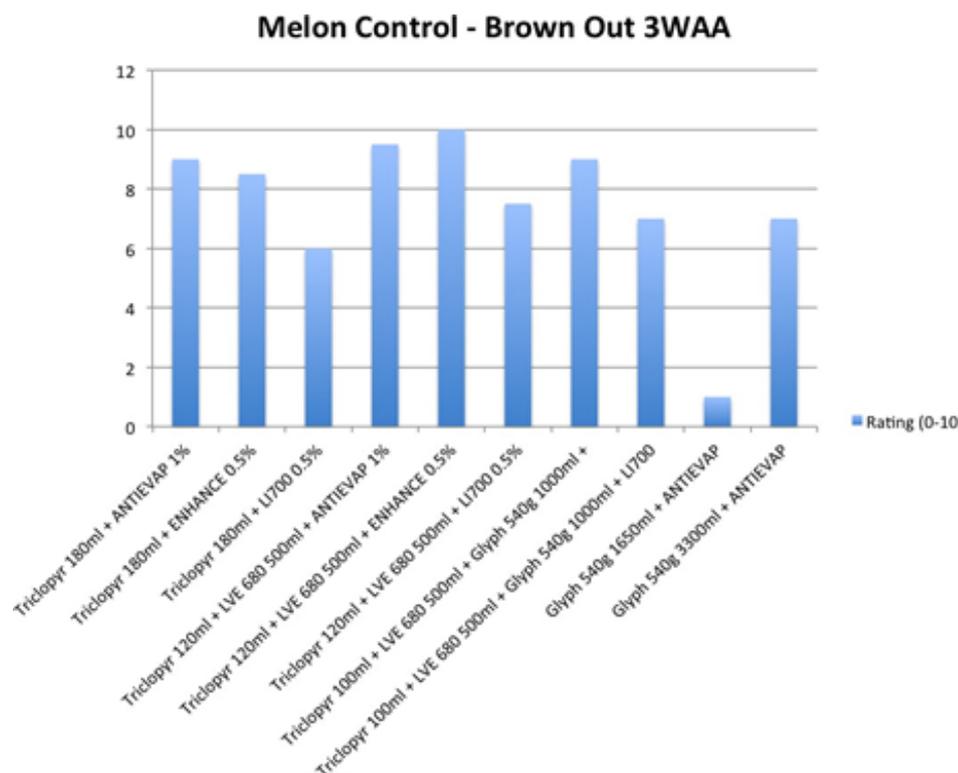


Chart 2: ANTI-EVAP® 1.0% and ENHANCE® 0.5% proved superior to LI700 with Triclopyr & Triclopyr + LVE mixtures. (Source: AgSense Western Australia 2012).



REFERENCES

- GRDC - Summer Fallow Spraying <http://tinyurl.com/l5a2hy2>
- GRDC - Summer Fallow Weed Management Reference Manual <http://tinyurl.com/paf7j86>
- PIR (SA) - Code of Practice, Summer Weed Control <http://tinyurl.com/pdzbls6>

FIND OUT MORE

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