4Front

Intelligence about the farm chemical business • Autumn 2016

4Farmers ...
...For Farmers

GLYPHOSATE HERE TO STAY – despite alarmist claims

Pandemonium has been created over the International Research on Cancer (IARC), an affiliated organisation of the World Health Organisation (WHO), that classified the world's most widely used pesticide Glyphosate as "probably carcinogenic to humans" in March 2015.

The same IARC category of "probable carcinogenics" includes red meat, food fried at high temperatures, and shift work that disrupts workers' body clocks.

Fortunately, Glyphosate was classified lower than the group of "known carcinogenics" that include alcoholic beverages, processed red meats and smoking.

As a matter of interest the IARC has no mandatory impact on any regulatory agencies. It only conducts initial screenings prior to comprehensive assessments by regulatory authorities.

Glyphosate would not be the first chemical that regulatory authorities have not confirmed the same view as an IARC screening.

OVERWHELMING CONSENSUS SAYS "SAFE"

The surprise IARC announcement was in contradiction with the overwhelming consensus among the World's most robust and stringent pesticide agencies as well as many reputable scientific organisations.

After consideration in the wake of the IARC claim, bodies like the APVMA in Australia have continued to endorse Glyphosate as being safe if used according to its label directions.

Most ironic was that among the many reputable scientific organisations contradicting the IARC were other affiliated WHO programs; namely the WHO Core Assessment Group, the WHO Guidelines for Drinking Water Safety, and the WHO international Program on Chemical Safety.

One of the most eminent organisations, foremost in the European Union regulatory system - widely recognised as one of the strictest in the world, is the European Food Safety Authority (EFSA).

After receiving a considerable amount of data, including the IARC report and data not considered by the IARC, EFSA declared in November last year that the active ingredient, Glyphosate was unlikely to pose a carcinogenic hazard to humans.

WHY DIFFERENT CONCLUSIONS?

The major reason for different views is that the IARC only looks at the "hazard" of Glyphosate. It does not context the potential hazard of Glyphosate into actual "risk" that a regulatory agent would.

A chemical risk assessment will consider the hazard of a chemical plus the exposure of humans that takes into account how the chemical is used and its formulation. For example, electricity and swimming pools are both potential fatal hazards. However with appropriate use they are safe, everyday family items.

A second factor for the isolated view of the IARC can be explained by the fact that it reviewed a narrower body of work - only published data. EFSA in contrast considered more data including unpublished studies.

Furthermore, the data that persuaded the IARC to come to its conclusion was largely based on selected animal studies, but limited weight was given to the human studies.

A third factor possibly contributing to the differing views is that the IARC looked at all Glyphosate based formulations regardless of composition whereas the EFSA focused on the glyphosate 'active ingredient'.

One such ingredient common in many formulations of Glyphosate is tallow amine. Some studies like one done in Japan, reported by Scientific America, claimed that patients who drank Glyphosate, either intentionally or accidently, became sick or died due to tallow amine, not Glyphosate.

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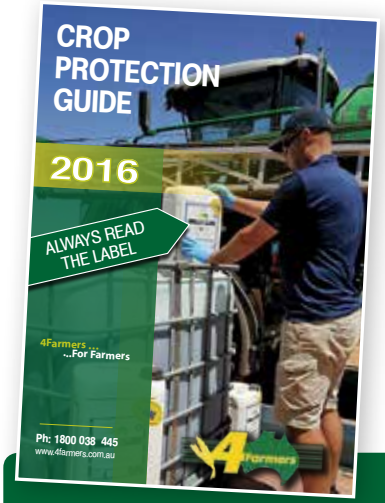

4 Farmers 2016 Crop Protection Guide – out now!

4Farmers Products

With Cross Reference to similar trade name products

Herbicides	Similar Product
2,4-D Amine 625, 750	Amicide 625®
2,4–D Ester 680	Estercide Xtra 680®
2,4–D Ester 800 (RP)	Various
2,4-D plus Picloram	Tordon™ 75-D
Amitrole 250	Amitrole T®
Atrazine 900, 600	Gesaprim®
Bromacil 800 WP (RP)	Uragran®
Bromox MA	Bromicide MA ®
Bromoxynil 200	Bromicide 200®
Brown Out	Spray.Seed®
Carfentrazone 240 EC	Hammer®
Chlorsulfuron 750	Glean®
Clethodim 240	Select®
Clodinafop 240	Topik®
Clopyralid 300, 750	Lontrel®
Cyanazine 900	Bladex®
Dicamba	Dicer 500®
Diclofop-Methyl 500	Hoegrass®
Diflufenican 500	Brodal®
Diflufenican/Bromoxynil	Jaguar®
Diuron 900	Various
Fluazifop 212	Fusilade®
Flumetsulam 800	Broadstrike®
Fluroxypyr 200	Starane™
Glufosinate-Ammonium 200	Basta®
Glyphosate 470,450,540	Roundup®
Glyphosate 875	Roundup Dry®
Haloxyfop 520	Verdict®
Ipic 240	Flame®
Imazethapyr 700	Spinnaker®
Imazapyr 750	Arsenal®
LV MCPA 570	LVE Agritone ®
LVE MCPA/ Diflufenican	Tigrex®
MCPA 500, 750	Agritone®
Metolachlor 960	Dual®
S-Metolachlor 960	Dual Gold®
Metribuzin 750	Lexone®, Sencor®
Metsulfuron Methyl 600	Ally®
Oryzalin 500	Surflan®
Oxyfluorfen 240	Goal®, Striker®
Paraquat 250	Gramoxone®
Pendimethalin 330	Stomp®, Argo®
Propyzamide 500	Kerb®,Edge®
Quizalofop-p-ethyl	Targa®
Simazine 900	Gesatop®
Sulfometuron 750	Oust®
Sulfosulfuron 750	Monza®
Terbutryn 500	Igran®
Tralkoxydim 400	Achieve®
Triclopyr 600 (755RP)	Garlon®
Trifluralin 480	Treflan®
Tri-pick	Grazon®
Turf Control	Spearhead®

70% formulated in Australia by 4Farmers

Seed Dressings	Similar Product
Imidacloprid 600	Gaucho®, Emerge®
Imid-Triadimenol	Zorro®
Procymidone 500	Sumislex ®
Tebuconazole 25T	Raxil®
Triadimenol liquid/WP150	Baytan C®
Triticonazole 200	Real®

Fungicides	Similar Product
Azoxystrobin 500	Amistar WG ®
Carbendazim 500	Bavistin®, Spin®
Chlorothaloril 720	Bravo®
Epoxiconazole 125	Opus 125®
Flutriafol 250, **500**	Impact®, Intake®
Iprodione 500	Iprodione Aquaflow ®
Mancozeb 750	Penncozeb 750 DF®
Procymidone 500	Sumisclex ®
Propiconazole 500	Tilt®, Throttle®
Tebuconazole 430	Folicur®
Triadimefon 125	Triad®, Slingshot®
Triadimefon 500 Dry	Unique to 4Farmers
Triadimenol 250	Bayfidan®,Shavit®

Insecticides	Similar Product
Alpha-Cyper 100, 250	Dominex®
Aluminium Phosphide Fumigation Pellets	Phostoxin®
Bifenthrin 100	Talstar®
Chlorpyrifos 500	Lorsban®
Dimethoate 400	Rogor®
Fenamiphos 400	Nemacur®
Fipronil 800	Regal ®
Imidacloprid 200	Confidor®
Lambda-Cyhalothrin 250	Karate Zeon ®
Omethoate 290	Le-mat®
Pirimicarb 500	Aphidex®,Pirimor®

Rodenticides	Similar Product
Rat and Mouse Bait Pellets	Talon®
Zinc Phosphide Unsterilised Mouse Bait	MouseOff ZP®
Strychnine Alkaloid Crystals 1080 Oat baits	

Other Products	Similar Product
Ammonium Sulphate	
Boom Cleaner	
Citric Acid	
Farm Pro 700	LI 700®
Foam marker	
Metaldehyde Snail/Slug Bait	
Penetrator	Pulse Penetrant®
Speedy Spray Adjuvant	Hasten®
Sunshade Spray Adjuvant	AntiEvap®
Turbo Charge	Supercharge®, Uptake®
Wetter 1000	

New Product

(RP) denotes products with Registration Pending at printing

Shuttle Gauge – a better way to measure liquid in an IBC

Nick Gillett, demonstrating his unique Shuttle Gauge.

Accurately measuring the quantity of liquid within shuttles or Intermediate Bulk Containers (IBCs) can be very frustrating.

The job is now much easier with a simple, low cost invention called the Shuttle Gauge.

Bencubbin farmer and 2014 Nuffield Scholar Nick Gillett developed the product after extensive testing on his own farming property where he crops over 8000ha.

The gauge eliminates the need to decant chemical into measuring buckets, use of flow meters and/or double handle with slow electric pumps.

One of the key points is that the gauge has the ability to compensate for an IBC not sitting level. This feature makes it ideal for working on a site that's not level such the back of a vehicle in a paddock.

Nick is also proud of the fact that the product is being manufactured by an Australian company offering employment opportunities to people with disabilities.

The gauges are made to last, being laser cut from marine grade stainless steel.

The Shuttle Gauge is now commercially available for $99 Inc. GST.

Nick will be displaying the Shuttle Gauge at 4Farmers Field Day sites they are attending this year. Alternatively, Nick can be contacted via nick@shuttlegauge.com.au

Introducing our new agronomist

Agronomist Nathan Dovey, has joined the 4Farmers team.

Nathan is based in Albany, having hailed from a farming family in Manypeaks.

He graduated with a BA in Ag Science from the University of WA in 2007, returned to farming for three years with his older brother and then joined Eurofins Australia, a company that specialises in conducting research trials.

Nathan invites input or opportunites to collaborate on trials with farmers, grower groups or other professional entities to investigate any chemical crop protection issue concerning them.

4Farmers new agronomist, Nathan Dovey.

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DEBUNKING THE MYTHS

"Bans by some countries like the Netherlands on Glyphosate flies in the face of good science", states Australian toxicologist , Dr Ian Musgrave, Senior lecturer in Pharmacology at The University of Adelaide.

"If you tried to get the concentrations we see in animal studies, you'd have to eat something like a half a kilogram of glyphosate a day. If you tried to eat the same amount of sodium chloride, table salt, you'd be very sick indeed."

In one study linking Glyphosate to human birth defects, Dr Musgrave points out the study soaked frog eggs in concentrate of glyphosate that were 11,000 times higher than are present in the environment. "In toxicology there is a saying 'it's the dose that makes the poison, even table salt is toxic in the right concentrations," he said.

Sri Lanka banned Glyphosate due to reported links with kidney disease.

According to Dr Musgrave, "The chronic kidney disease found in parts of Sri Lanka is due to arsenic found in the phosphate fertiliser they're using. It has nothing to do with glyphosate."

"We should be basing our use of any chemical, be it herbicide or a drug, on good science. And a lot of what people are reacting to, is stuff that has been disproven."

HARD TO REPLACE

Farmers have a strong vested interest to protect the right to use Glyphosate as it is difficult to contemplate many modern farming systems without it.

Not only is there a lack of effective alternatives, but the higher use of some products like Paraquat could be of far greater health concern.

All pesticides must be treated with great respect and Glyphosate has never been "safe enough to drink". Neither is drinking alcoholic beverages or eating red meat totally safe. Considering a ban on smoking could arguably make more scientific and economic sense than banning Glyphosate.

While we hope Glyphosate isn't banned on dubious health concerns, hopefully farmers in the meantime will take care not to shoot themselves in the foot by allowing weed resistance to develop any sooner than it should, and lose it for themselves anyway.

CORRECT MIXING OF CHEMICALS - AVOID A DISASTER IN YOUR SPRAY TANK

Acknowledgement: Eureka Agresearch

To minimise the risk of products interacting badly in your spray tank it's important to follow the correct order of adding chemicals to a tank mix, and the correct method of addition.

Note: some products should never be mixed together. For example a foliar fertiliser should never be mixed with a phenoxy herbicide.

1: WATER

Most interactions between chemicals are intensified by increased concentration, so the first item into the tank should be at least 70% of the total amount of water. Be warned, mixing products in a spray tank before water is added can result in severe interactions.

2: WATER CONDITIONERS INCLUDING AMMONIUM SULPHATE

The role of a conditioner is to modify the water to better suit or protect the products to be added. They should always be mixed in thoroughly before product is added.

3: WETTABLE POWDERS (WP)

Solid chemicals react at their surface so the larger the surface area, the greater the potential for reactions. Wettable powders have a huge surface area, and are formulated with matching wetters and dispersants to ensure they wet-up and disperse uniformly in the tank to form a stable suspension.

The ingredients in some products can greatly interfere with this process – crop oils and emulsifiable concentrates are particularly problematic.

4: WETTABLE GRANULES/WATER DISPERSIBLE GRANULES/DRY FLOWABLES (WG/WDG/DF)

These are essentially, wettable powders compressed into granules that have to disintegrate before suspending in water. They take longer to form a uniform suspension than WPs. The time taken depends on the product, agitation in the tank and the temperature and quality of the water. Tests have shown a minimum of 10 minutes is needed.

5: SUSPENSION CONCENTRATES/ FLOWABLES

Eg. Propyzamide SC.

These are powders that have been pre-milled and mixed with water. They form a uniform suspension faster than the two preceding groups. They're designed with a careful balance of dispersants which can be upset by the presence of other, incompatible or competing surfactants. Emulsifiers or surfactants in crop oils and emulsifiable concentrates pose the biggest risk.

6: EMULSIFIABLE CONCENTRATES

Eg. Trifluralin EC.

These are called emulsifiers because their role is to drive the active ingredient and solvent into stable emulsion droplets when added to water.

A stable emulsion will only form if the balance of emulsifiers is correct.

The ingredients in WPs, WDGs or SCs can be affected by emulsifiers which is why ECs are added after the preceding product groups. It is also possible for the emulsifier system in an EC to be incompatible with those in another EC.

7: WATER SOLUBLE GRANULES (SG)

Eg. Glyphosate 875 SG.

These granules dissolve in water rather than suspend. It's a process that proceeds more readily than for WDGs. They contain dispersants and wetters to speed the process.

The effect of the ingredients is not usually strong enough to break the emulsion formed by an EC but it has been known to tip the balance in some complicated mixes or where water quality is poor if added after ECs.

8: SOLUBLE LIQUID PESTICIDES

Eg. Glyphosate 450.

When added to the tank, these products undergo a simple dilution process and should be added after all the product groups above.

9: FLEXI N AND OTHER LIQUID NUTRIENTS

Be very wary about mixing any nutrients. Mixes with these can be especially problematic. These products, can drastically interfere with the job of materials like dispersants or emulsifiers if added earlier.

ADDITION NO 10: ADJUVANTS

Eg. Wetter 1000.

All remaining adjuvants are added last. This should be done after all the other products have had a chance to mix thoroughly through the tank.

Example 1: Glyphosate added to solution first then Ester 680 causing the Ester to precipitate. The pH of the water made no difference.

Example 2: Flexi N can wreak havoc on emulsifiers and dispersants. Sample on left example of adding Flexi N to the tank before an EC that has led to serious separation problems.

TRIFLURALIN – HOW IT WORKS

Source: Eureka Agresearch

Trials consistently prove that high rates of Trifluralin can be the most cost effective pre-emergent chemical application for the control of ryegrass.

To get the most from this widely used chemical it is useful to know how it works.

Photo: ABC

HALTS CELL DIVISION

Trifluralin is a member of the Dinitroaniline family from within Group D. These chemicals inhibit the division of cells at the root tip. Without cell division, the roots stop growing and the weed's growth grinds to a halt.

A droplet of Trifluralin EC dries on the soil to form tiny Trifluralin crystals. These are mixed with the soil by incorporation. The crystals produce a vapour of Trifluralin around them which slowly disperses into the pores of the surrounding soil.

It will continue to disperse away from the source until the concentration gradient is no longer sufficient to drive the Trifluralin molecules further.

SMALL, SLOW MOVEMENT IN SOIL: GOOD COVERAGE A MUST

Trifluralin might be considered volatile by pesticide standards with a vapour pressure of 6 million Pa but what does this mean?

By comparison, petrol has a vapour pressure of 10 million Pa and water is 2-3 million!

So even when high rates of Trifluralin are applied, the concentration of Trifluralin gases to disperse in the soil is relatively low.

Under normal conditions, Trifluralin gas moves millimetres rather than centimetres in the soil. This demonstrates how critical it is to have even spray coverage and good soil incorporation if Trifluralin is to control every weed seedling.

On average, 3-4 times as much Trifluralin is needed to come into contact with the coleoptile compared to the roots to cause the same level of damage. Therefore Trifluralin is far more effective at controlling weeds when it is in the root zone but some chemical is still absorbed through the coleoptile. This is in contrast to Triallate that is mostly absorbed via the coleoptile.

TIME NOT SUNLIGHT IS CRITICAL TO TRIFLURALIN LOSES

Volatilisation of Trifluralin left unincorporated causes considerable loss in efficacy.

Trials showed that the efficacy fell by 62% when incorporation was delayed for 48 hours after Trifluralin application.

Of the amount of Trifluralin lost in this 48 hour period; 39% was lost in the first two hours, 55% was lost in the next 22 hours and only 6% was lost in the following 24 hours (24 – 48 hours after spraying).

This demonstrates incorporation as soon as possible after application significantly improves efficacy of the Trifluralin applied.

Sunlight or UV radiation surprisingly made little difference to the loss of Trifluralin.

The same trial in sunny conditions had no significant difference

MORE EFFECTIVE IN CLAY SOILS

Studies have looked at Trifluralin volatisation from a range of soils.

Trifluralin incorporated immediately after application (0h) was 21% more effective at reducing emergence of ryegrass in alkaline clay than in alkaline sand.

It is speculated that the more sandy soils continue to lose Trifluralin from their surface after incorporation.

Left for 48 hours before incorporation there was much less volatilisation from the clay; 39% from the clay compared to 62% from the sand.

Trifluralin is also known to have a particularly strong affinity for organic matter.

It was not surprising in this trial that the alkaline clay had an organic carbon content of 2.2% compared with 0.6% for the sand.

Trifluralin efficacy is not strongly affected by soil pH.

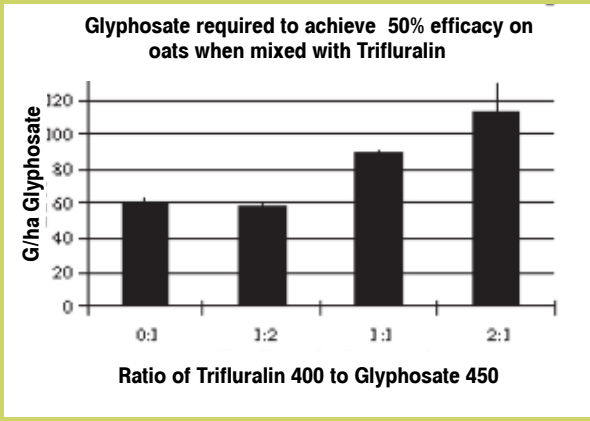
SUMMARY

While it may be impossible to provide the ideal conditions, it is important to understand the optimum situation from this research so as to best utilise Trifluralin.

- Incorporate evenly in the root system of the weeds
- Incorporate immediately after spraying
- Sunlight makes little difference to volatisation
- Clay or higher organic soils will tend to retain more Trifluralin

BEWARE: High rates of Trifluralin is antagonistic to Glyphosate

Antagonism of Trifluralin at relatively high rates to Glyphosate can be very significant.



Trials have shown at a ratio of 1:2 Trifluralin to Glyphosate, there is no significant reduction in the efficacy of Glyphosate.

However, when the ratio is increased to 2:1, Glyphosate activity is reduced by 46%.

This loss in Glyphosate efficacy was eliminated in trials by the addition of ammonium sulphate (AMS) solution at 1% of spray solution.

Antagonism also occurs when Glyphosate is mixed with other pesticides like Atrazine or Simazine too, and can also be solved with the addition of AMS.

Furthermore, AMS can overcome problems with water hardness and improve absorption of chemical into plants.

The addition of Ammonium Sulphate literally floods the spray solution with Nitrogen and Sulphate ions.

The Sulphate ions form conjugate salts with the hard water cations to neutralise them. Nitrogen attaches to the Glyphosate and this form is readily absorbed by the plant leaf.

Reference: Bedgood, Vic. Institute Dryland Agriculture

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For those who prefer to buy Australian owned and made goods, we're proud to say that when it comes to 'ag chemicals' we're among the most Australian of them all.

You surely have no better choice than 4Farmers because we're Australian owned, we manufacture most of our products ourselves and farmers with a local distributor nearby can buy through them.

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