

Chemical Prices



Understanding Trifluralin Fundamentals

3

Investigation



Problems with chemicals? You need to put your super sleuth hat on

4

Problems



Examples of Problems from the Field

5

WOW! Take a look at what New Zealand farmers are paying for their chemicals!

Australian farmers take it for granted that they now have some of the lowest chemical prices in the world.

Comparing some indicative prices of a few selected products in Australia with a large New Zealand farmer brought home the price advantage that Australian farmers have.

Granted NZ could be a little more expensive because it is smaller and more fragmented. There also seems to be strong farmer ties to suppliers with full service agronomy packages or other services provided such as seed supply.

In contrast Australian farmers either don't need to rely on professional agronomy advice or understand the value of independent services. Many are also savvy enough to know the actives in various products and can see past the marketing bluff of trade names.

An informed market, more free to make its own choice, also needs to have an

Product	Australia Price		NZ Price		Difference
Azoxystrobin 500 WG	\$54.60	kg	\$92.99	kg	\$38.39
Bromoxynil+Diflufenican	\$11.65	litre	\$30.50	litre	\$18.85
Carfentrazone 240 EC	\$102.30	litre	\$248.20	litre	\$145.90
Clethodim 240 EC	\$10.95	litre	\$42.00	litre	\$31.05
Clopyralid 300	\$18.60	litre	\$38.30	litre	\$19.70
Diflufenican 500	\$28.65	litre	\$101.25	litre	\$72.60
Diuron 900 WDG	\$9.27	kg	\$22.95	kg	\$13.68
Glufosinate Ammonium 200	\$17.15	litre	\$22.50	litre	\$5.35
MCPA Amine 750	\$8.95	litre	\$10.50	litre	\$1.55
Oxyfluorfen 240 EC	\$13.65	litre	\$168.48	litre	\$154.83
Tebuconazole 430 SC	\$10.95	litre	\$72.36	litre	\$61.41
Triclopyr 600	\$13.65	litre	\$21.94	litre	\$8.29
Trifluralin 480	\$6.10	litre	\$8.80	litre	\$2.70

aggressive marketer like 4Farmers.

The strong competition 4Farmers brings to the market has brought reduced prices. 4Farmers has also brought more transparency to the market like having a

policy of calling products by their active ingredient not fancy trade names. A panel on the back page shows the impact that 4Farmers has had on Australian prices over the past 20 years.

Soft prices on Glyphosate and Paraquat One off events – the potential danger!

Good news in regards to chemical prices: The markets for Glyphosate and Paraquat are soft.

Demand in Latin America for Glyphosate has fallen and supply in China is excessive.

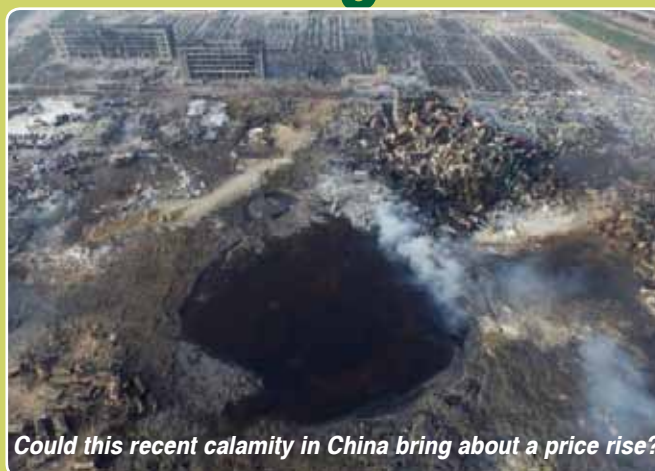
A similar fundamental story exists for Paraquat. Supply is strong and there's only moderate demand.

The most significant factor in the short term for chemical supplies could be one off shock events like

the recent explosion of a chemical warehouse at the port city of Tianjin, China.

An event like this has the potential to cause ripples in the industry and disrupt supply of other chemical plants. Much like there have been environmental crack-downs on chemical plants, there could also be a crack-down on safety in the wake of this event.

4Farmers will be offering competitive deals this spring for those wanting to hedge their supplies at the present levels.



Could this recent calamity in China bring about a price rise?

4Farmers Products

With Cross Reference to similar trade name products

Herbicides

Amitrole 250

2,4-D Amine 625, 750
2,4-D Ester 800 (RP)
2,4-D Ester 680
2,4-D plus Picloram
Atrazine 900 WG 600SC
Bensulfuron 600 WG,
Bromacil 800 WP (RP)

Bromox MA
Bromoxynil 200
Brown Out
Carfentrazone 240 EC
Chlorsulfuron 750 WDG
Clethodim 240EC
Clodinafop 240EC
Clopyralid 300EC, 750SG
Cyanazine 900 WDG
Dicamba 500 EC
Diclofop-Methyl 500
Diflufenican 500SC
Diflufenican/Bromoxynil
Diuron 900DF
Fluazifop 212EC

Flumetsulam 800 WG

Fluometuron 900WG
Fluroxypyr 200 EC
Glyphosate 470,450,360,540
Glyphosate 875
Glufosinate-Ammonium 200
Haloxypfop 520EC
Imazethapyr 700WG
Ipyr 750WG
Ipic 240
LV MCPA 570
LVE MCPA/ Diflufenican
MCPA 500, 750
MCPA/Picloram
Metolachlor 960 EC
Metribuzin 750WG
Metsulfuron Methyl 600WG
Oryzalin 500SL
Oxyfluorfen 240EC
Paraquat 250
Pendimethalin 330EC
Propyzamide 500SC, 900WG
Quizalofop-p-ethyl
Simazine 900WG
Sulfometuron 750WP
Sulfosulfuron 750
Tralkoxydim 400WG
Tri-allate 500EC
Triasulfuron 750WG
Tribenuron Methyl 750
Triclopyr 600EC
Trifluralin 480EC
Tri-pick
Turf ControlSC

Similar Product

Amitat®
Various
Various
Various
Tordon™ 75-D
Atradex®, Gesaprim®
Dupont Londax DF®
Uragran® WG
Bromicide MA®
Buctril®
Spray.Seed®
Hammer®
Glean®, Siege®
Select®
Topik®
Lontrel®
Bladex®
Dicer 500®
Hoegrass®
Brodal®
Jaguar®
Diurex WG®
Fusilade®
Broadstrike®
Nu-tron 900 DF
Starane™
Roundup®
BiDri700®, Roundup Dry®
Basta®
Verdict®
Spinnaker®
Arsenal®
Flame®
Nufarm LVE Agritone®
Tigrex®
Various and Agritone®
Tordon™ 242
Dual®
Lexone®, Sencor®
Ally®
Surflan®
Goal®, Striker®
Gramoxone®
Stomp®, Argo®
Kerb®, Edge®
Targa®
Gesatop®, Simagranz®
Oust®
Monza®
Achieve®
Avadex®
Logran®
DuPont™ Express®
Garlon®
Treflan®
Grazon®
Spearhead®

70%
formulated in
Australia
by 4Farmers

New Product

(RP) denotes products with Registration Pending at printing

Seed Dressings

Imidacloprid 600 SC
Imid-Triadimenol
Iprodione 500 (RP)
Procymidone 500 SC
Tebuconazole 25T
Triadimenol 150 + WP
Triadimenol 150 liquid
Triticonazole 200

Similar Product

Gauche®, Emerge®
Zorro®
Rovral®
Sumislex®
Raxil®
Baytan®, Baymax®
Baytan®, Baymax®
Real®

Fungicides

Azoxystrobin 500 WG
Carbendazim 500
Chlorothaloril 720
Epoconazole 125 SC
Flutriafol 250SC, **500SC**
Iprodione 500
Mancozeb 750 WG
Procymidone 500
Propiconazole 250EC, 500EC
Tebuconazole 430SC
Triadimefon 125EC
Triadimefon 500 Dry
Triadimenol 250EC

Similar Product

Amistar WG®
Bavistin®, Spin®
Bravo®
Opus 125®
Impact®, Intake®
Rovral®
Penncozeb 750 DF®
Fortress 500®
Tilt®250®
Folicur®
Triad®, Slingshot®
Tee-Fon 500®
Bayfidan®, Shavit®

Insecticides

Abamectin 18EC
Alpha-Cyber 100EC, 250SC
**Aluminium Phosphide
Fumigation Pellets**
Bifenthrin 100EC
Chlorpyrifos 500EC
Cypermethrin 260EC
Dimethoate 400EC
Fenamiphos 400
Fipronil 800 WG
Imidacloprid 200SC
Lambda-Cyhalothrin 250SC
Omethoate 290
Pirimicarb 500

Similar Product

Vertimec®
Fastac Duo®, Alpha Forte®
Phostoxin®
Talstar®
Lorsban®
Scud®, Sonic®
Rogor®
Nemacur®
Regent®
Confidor®
Karate Zeon®
Le-mat®
Aphidex®, Pirimor®

Rodenticides

Rat and Mouse Bait Pellets
Zinc Phosphide
Unsterilised Mouse Bait
Strychnine Alkaloid Crystals
1080 Oat baits

Similar Product

Talon®
MouseOff ZP®

Other Products

Ammonium Sulphate
Boom Clean Dry
Citric Acid
Ethephone 720 SL
Farm Pro 700
Foam marker
Metaldehyde Snail/Slug Bait
Glyphosate Wetter
Penetrator
Speedy Spray Adjuvant
Sunshade Spray Adjuvant
Turbo Charge

Similar Product

Galleon® Growth Regulator
LI 700®
Gly Wetter Plus Surfactant®
Pulse Penetrant®
Hasten®
AntiEvap®
Enhance, Supercharge®,
Uptake®

Wetter 1000

Waste management controls likely to keep Trifluralin prices firm

The market for Trifluralin 480 in Australia is estimated to be approx 12-15 million litres annually.

To meet production of this approximately 6-7.5 thousand tonnes of Trifluralin TGAC (technical grade active ingredient) is imported to meet this demand.

Supplies largely come from just two main suppliers in China.

Australia's demand is estimated to be as much as 80% of the global demand.

Local manufacture by Nufarm is believed to be minimal, though a 5% tariff to protect this supposed production exist.

Some of the key raw ingredients that make Trifluralin TGAC are: 4-chlorobenzotrifluorid, hydrogen chloride, sulfuric acid and nitric acid.

The materials are reacted in an environment of hydrogen fluoride. Fluorine is a material China has a natural advantage in.

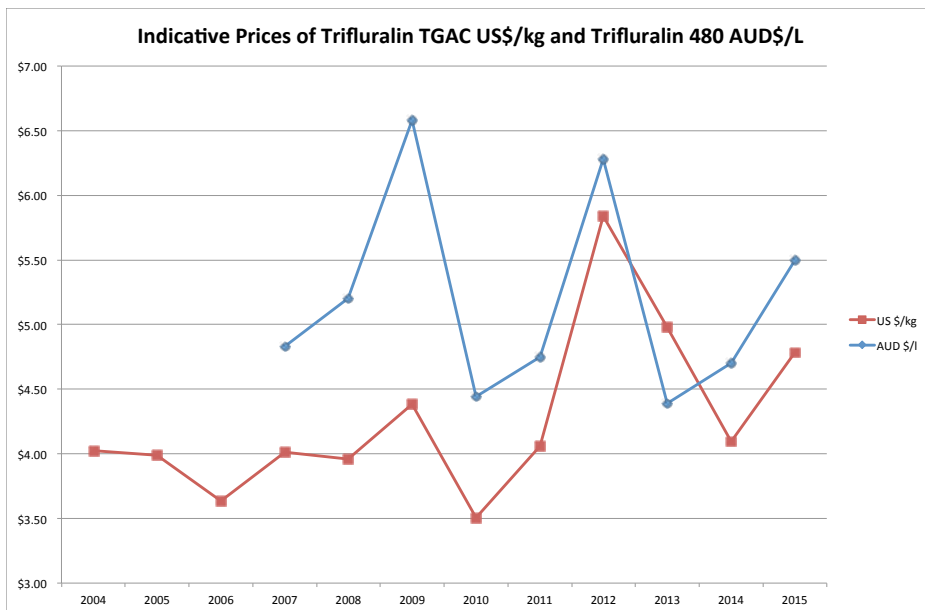
Prices for Trifluralin TGAC peaked in 2012. This was largely a result of restrictions in the supply of raw material.

The TGAC price dropped 2014. It is believed this was due to depressed demand in this period and a preference for newer pre emergent Ryegrass alternatives.

Since then, demand returned to previous levels.

WASTE MANAGEMENT

One of the problems with production of this product is that for every 1 tonne



of Trifluralin TGAC produced, 3 tonne of acid waste occurs. The recently tightened restrictions in China on waste management has been driving some of the present TGAC cost pressures and may yet force further pressure.

The cost of the TGAC accounts for around 50-60% of the final retail price.

Thus, there's no surprise in seeing a strong correlation with TGAC \$US/kg and Trifluralin retail price AUD\$/litre.

EXCHANGE RATE

Another significant factor that shifts the

relationship between these two factors is AUD exchange rate. It was in 2009 for example the AUD crashed to \$0.65 exchange. In contrast, much of the period 2011 to 2013 the AUD was fetching better than parity and had strong buying power of imports.

Currently Trifluralin TGAC prices sit in a range US\$4.70-4.80/kg and are expected to firm as buying picks up later this year.

The TGAC price is similar to last year, but the slightly weaker dollar means retail pricing of Trifluralin 480 will be up to AUD\$6.00/litre.



Spray Planning and Records Made Easy by iPaddockSpray

Mic Fels is a farmer with an 11,000ha cropping operation with wheat, barley and canola which he has built up from just 900 ha in 1983.

Aside from being a successful farmer Mic is also the MD of farm software company iPaddock. Using his first hand knowledge has allowed him to invent award winning software apps iPaddockSpray and iPaddockYield.

iPaddockSpray manages your whole spraying operation from planning, through to tank filling and record management, with a practical focus on making the whole operation quicker-better-easier.

Other benefits are that it has no ongoing subscriptions or fees, can



be used anywhere with or without mobile reception, and has calculators that tell you the exact amount of every chemical required in a tank so reducing human error.

The iPaddockYield app designed to forecast crop yields won Mic the 2012 GRDC Grain Inventors Award.

A successful farmer and progressive thinker we also think it no surprise Mic is also a strong supporter of 4Farmer chemicals.

For more information go to www.ipaddock.com.au

PROBLEMS WITH CHEMICALS?

You need to put your super sleuth hat on

Field problems with chemicals of any sort are an unwelcome headache for all; farmer, chemical manufacturer, and everyone in between.

Finding the cause of a problem can be like a “Who done it mystery”.

As such, it pays to approach the problem like a super sleuth. Carefully collect all the facts and details as well as staying objective.

While poor quality chemical is always a possibility (an easy scapegoat) more often than not, there’s another problem. Overlooking the real culprit enhances your chances of the problem happening again.

Reputable suppliers like 4Farmers test every batch of chemical in their own lab. There is also less chance of issues when the product

is manufactured in-house like most of 4Farmers products.

Furthermore, 4Farmers retains samples

of every batch of chemical sold in case of future problems. QC testing is available to any client on request.

Poor Pesticide Efficacy		Crop Damage	
Incorrect chemical selected Correct spray rare applied Unsuitable adjuvant		Incorrect chemical selected Correct spray rare applied Unsuitable adjuvant	
Tillage regime	Incorporation of chemical or lack of Uneven chemical spread	Tillage regime	Incorporation of chemical Uneven chemical spread
Moisture	Lack of moisture Too much water Intensity and/or timing	Moisture	Lack of moisture Too much water
Antagonism	Tank mix antagonism Biological incompatible eg Glyphosate+Paraquat	Residues of Harmful Chemical	In tank or lines of sprayer In water In soil from past application
Environment	Time of day/night Temperatures Wind Speed	Chemistry	
Application	Nozzle type Pressure Boom Height	Incorrect chemical selected Unsuitable water conditioner or adjuvant	
Water Quality	pH Muddy water Hardness Salt Water temperature	Water Quality	pH Muddy water Hardness Salt Water temperature
Ground Conditions	Soil Type Trash/Canopy/Stubble Treatment Seedbed condition	Incorrect mixing order of products and procedure Insufficient agitation of product Tank mixed products are incompatible Unsuitable formulation of chemical	
Resistance of pest to chemicals			

FIELD PROBLEMS WITH PESTICIDES

These can generally be classified into three categories;

1. Poor efficacy on target pest
2. Crop damage
3. Chemistry fault

The following factors are worth considering aside from the quality of chemicals themselves. Some are common to more than one category. For example, one factor common to all categories is to double check if the intended chemical was correctly selected and not mixed up with another product.

INVESTIGATION STEPS

Poor efficacy or crop damage is only noticed some time after application. If you're concerned about one of these issues the following steps should be taken:

1. **Take notes and photos** of symptoms, failures or other relevant conditions.
2. **Pay special attention** to areas of spray misses and double applications. These areas can give some definitive leads to the effect of the spray. It could be useful to consider intentionally not spraying small patches to test what your sprays are doing.
3. **Collect and review relevant paddock records.** Aside from detailed spray records, other useful information could be: sowing records, paddock history and daily rainfall.
4. **If not already recorded, double check the brand** of products used as well as batch numbers and date of manufacture.
5. **Armed with this information refer to professional advice.** The chemical supplier is a good place

to start. They should have the best understanding of the chemistry and correct use of the product. A good chemical company gratefully welcomes feedback from users of its products.

6. **If the chemical cannot be ruled out** as a potential problem then put aside whatever product is left. It is best to get samples tested initially with the supplier as they will be free and should have the expertise to do this. If it is possible, 200ml or grams is a good sample quantity. Take care not to contaminate the sample.

Residues in drums can be useful but be aware that small amounts may not always be reliable. A small amount of product has a greater likelihood of both contamination and natural changes that occur when a product is exposed to the large amount of air left in an almost empty drum, especially if the cap has been left off.

CHEMISTRY

Analysing chemistry faults also starts with collecting relevant information: what is being mixed, the mixing process, water quality and observations of what has happened.

Hopefully, with this information a qualified professional or a chemical supplier might offer a quick solution.

Another route is to conduct a small scale experiment with a problem mix in a jar.

Also consider systematically dropping certain chemicals from a tank mix. The aim is to strip the mix back to something simpler that is known to work so as to isolate the possible offender.

Switching to a different brand of the same active can be a worthwhile alternative too.

It doesn't necessarily mean the first product is a poor quality product. It might simply be its formulation ingredients are different and not suited to a particular tank mix. For example lots of dispersing agents in a granule formulation are generally good for dispersing granules to prevent blockage. However, in a certain tank mix, a poor quality granule with less dispersing agents might actually mix better.



Examples of Problems from the Field

Poor Efficacy

Glyphosate mixed with high rate Group G Carfentrazone can cause a biological incompatibility.

The Carfentrazone works quickly and shuts down a plant like Paraquat, not allowing Glyphosate to properly translocate. Keeping Carfentrazone rates lower, say 40ml/ha or less, can minimise this problem as well as spraying in conditions conducive to allowing more translocation, like when low light.



Crop Damage

Wheat seedlings from crop with poor emergence after application of 2L Trifluralin + 1.5L Triallate + 0.5L Metolachlor 960 + 0.5L Ester 680 + wetter + SOA. Moisture conditions were marginal when sown in late April, sowing was with knife points, 12 inch spacing, 9 km per hour.

The likely diagnosis was the aggregate damage from Metolachlor and Triallate exacerbated by marginal moisture conditions and other chemicals. Both Metolachlor and Triallate are absorbed through the coleoptile and have little or no effect on germination. They cause the coleoptile of wheat to shorten. If the coleoptile is not long enough to reach the soil surface the leaf is forced to emerge prematurely from the coleoptile while it is still underground.

Emergence will be greatly reduced. If the seedling does emerge the crop is initially stunted but will grow out if chemical concentrations are low.

Other possibilities were Trifluralin or Ester damage but ruled out as a principle problem due to their lack of characteristic symptoms.

Trifluralin inhibits cell division at the root tip and can affect the coleoptile. Roots and coleoptile would be thickened and stunted.

2,4-D is mostly absorbed by shoots. 2,4-D symptoms are stunted growth and growth distortion whereby tissue is thickened and stems curl.

The chemicals and rates applied in this situation are very common. It highlights the difficult balance between achieving weed control without damage however hard we might try with strategies like wide spacing, slow speed and careful seed placement.



Chemistry

Simazine granules (right of photo), a multi national brand have only 42% of particles below 10 micron and a long tail of coarse particles. This is far higher than the minimum standard of the clean white 4Farmers product (left) with 90% below 10 micron and a tight band of particle sizes after this.

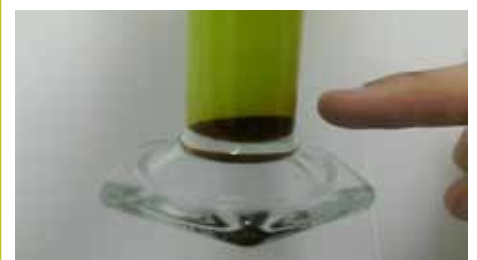


The photo below illustrates that the coarse multi national brand Simazine is difficult to disperse. Irrespective solution pH, particles of the coarse Simazine settled out soon after aggressive aggregation was stopped. Therefore the risk of filter blockage would be high.



Another example of a chemistry problem is mixing Trifluralin in a low pH environment.

This could easily happen with Glyphosate and Farmpro (like Li700®). Glyphosate works best at a lower pH therefore using Farmpro is understandable. However when a solution is too acidic, Trifluralin can react and precipitate out of solution as shown in the photo.



Hard water makes hard going for Glyphosate

Glyphosate is manufactured as the acid form but converted to various salts to improve its solubility in water and its efficacy. These salts form positive and negatively charged ions in a spray tank.

Hard water can have a large numbers of calcium and magnesium ions that react with the glyphosate ions in the spray tank to form calcium glyphosate or magnesium glyphosate. These "salts" are poorly soluble in water, form crystals on drying on the plant foliage that lock up the glyphosate and as a result severely reduce efficacy

REDUCED EFFICACY

Glyphosate efficacy is dramatically reduced with increasing water hardness. In trials the glyphosate active ingredient required for 50% weed reduction (ED50) rose from 69g/ha in soft tap water (32ppm hardness), to 653g in 3,000ppm hard water or a 90% reduction

in efficacy. Even at just 330ppm hard water, efficacy of glyphosate reduced by 74%.

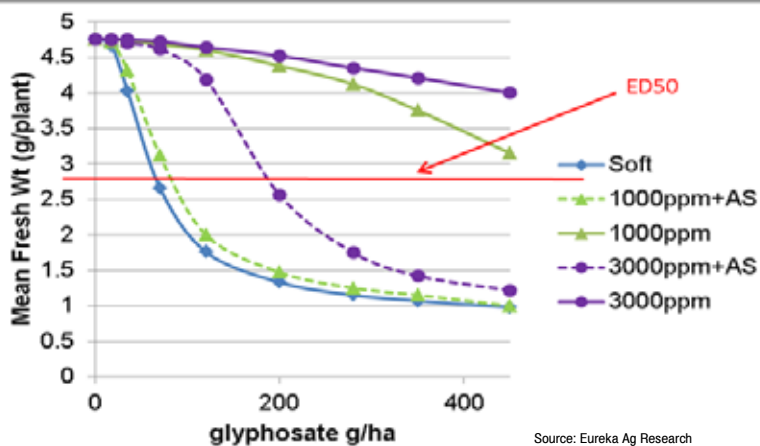
Ammonium sulphate is an excellent treatment for hard water problems with glyphosate. If sufficient ammonium ions are dissolved in the water they can overwhelm the calcium and magnesium ions.

The sulphate ions bind with the calcium and magnesium causing them to precipitate in the tank. Beware of the increasing the risk of filter residues this can create.

Glyphosate is then far more likely to bind with ammonium ions than the calcium or magnesium ions. Ammonium glyphosate is a desirable form. It is very soluble and is more quickly absorbed into the plant than other forms of salt.

A typical rate used of Ammonium Sulphate is 1% by spray volume. Farmers with very hard water might consider adding more.

Ammonium sulphate is not as effective at binding iron ions if this is what the hard water contains.



Effect of hard water, application rate and ammonium sulphate (AS) on the efficacy of Glyphosate 450 on annual ryegrass. ED50 is the point of 50% control.

FARMERS: Here's the impact that 4Farmers has made to your pocket over the years...

How 4Farmers has worked for you...

Year	Product	Typical Market \$ Before 4Farmers Entry	4Farmers Approximate Entry Price	Reduction on Market
1995	Chlorsulfuron 750 1kg	\$800	\$425	47%
1996	Glyphosate 450 20L	\$210	\$175	17%
1996	Wetter 1000 20L	\$140	\$100	29%
1997	Metsulfuron 600 1kg	\$1,360	\$400	71%
1997	Chlorpyrifos 20L	\$350	\$250	29%
1998	Metribuzin 1Kg	\$90	\$60	33%
1998	Cypermethrin 20L	\$850	\$450	47%
1998	Triadimenol 150 1L	\$65	\$35	46%
1999	Triadimefon 125 20L	\$1,100	\$170	85%
1999	Carbendazim 500 1Kg	\$70	\$35	50%
2000	Pirimicarb 500 10 Kg	\$500	\$350	30%
2000	Tri-allate 400 20L	\$225	\$175	22%
2000	Meflalachlor 720 20L	\$380	\$275	28%
2000	Diclofop-methal 375 20L	\$450	\$380	16%
2001	Alpha-Cyber 20L	\$900	\$315	65%
2001	Propyzamide 500 10Kg	\$1,100	\$550	50%
2002	Diflufenican 500 1L	\$150	\$110	27%
2002	Tebuconazole 430 SC 1L	\$142	\$80	44%
2002	Abamectin 20L	\$300	\$210	30%
2003	Triflufuron 20L	\$410	\$310	24%
2004	Propiconazole 250 20L	\$800	\$640	20%
2004	Flutriafol 250 SC 1L	\$42	\$32	24%
2004	QPE 100 10L	\$500	\$260	48%
2004	Bromoxymil 200 20L	\$300	\$220	27%
2004	Clopyralid 300 5L	\$300	\$255	15%
2005	Bifenthrin 10L	\$400	\$350	13%
2006	Tralkoxydim 400 5Kg	\$400	\$320	20%
2006	Simazine 900 1Kg	\$8.50	\$7.50	12%
2006	Atrazine 900 1Kg	\$8.50	\$7.50	12%
2007	Clodinafop 240 1L	\$350	\$240	31%
2007	Clethodim 240 1L	\$57	\$37	35%
2007	Cyromazine 5L	\$300	\$218	27%
2008	Haloxypol 520 1L	\$140	\$80	43%
2008	Cynazine 900 1Kg	\$30	\$9	70%
2011	LVE MCPA/Diflufenican	\$300	\$213	29%
2011	Imazapic 240 20L	\$3,500	\$800	77%
2011	Imidacloprid 600 SC 20L	\$1,100	\$500	55%
2011	Imazethapyr 700 WG 5kg	\$1,500	\$505	66%
2012	Azoxystrobin 500WG 10kg	\$1,800	\$900	50%
2012	Procyimdone 500SC 20L	\$1,120	\$400	64%
2013	Dicamba 20L	\$598	\$400	33%
2013	Sulfosulfuron 750WG 0.5kg	\$475	\$200	58%
2014	Diflufenican/Bromoxymil 20L	\$255	\$156	39%
2015	Flumetsulam 800 WDG 1kg	\$540	\$320	41%

Your order is just a phone call away!

4FARMERS can supply chemicals to anywhere in Australia

Simply call your local 4Farmers distributor – or if there's no distributor in your area call the head office – so easy!

Head Office 1800 038 445
www.4farmers.com.au

