

## Changes in product pricing and availability

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### Summary

**Herbicide prices to Australia over the past 10 years have risen less than other agricultural inputs. Competition from new products, a selection of good commodity products and a poor farm economy have all moderated price increases.**

**The requirement for more detailed toxicological and environmental studies has resulted in many products sold for speciality uses being withdrawn from the market. This will continue and possibly escalate unless changes are made in regulatory requirements. The prime factor that will ensure continued availability is a healthy agricultural economy.**

### Introduction

In the early 1970s the herbicide business, worldwide, was growing rapidly. Markets were expanding as more hectares were being treated and more land planted. A new generation of selective weed killers was being sold to prosperous farmers around the world. One of the major problems facing chemical manufacturers was obtaining adequate supplies of petrochemicals to produce products and devising allocation mechanisms for their customers. Chemical retailers often allocated new products to farmer customers and the crops harvested were sold easily at profitable prices.

In the last 10 years many factors have changed, as anyone who is acquainted with the herbicide business or weed control can attest. Some of the major factors that have affected pricing and availability of herbicides are as follows. (i) The price of oil, which rose from \$4-5 per barrel to \$30 per barrel, has declined to less than \$10 per barrel. (ii) Patents have or will be expiring on many key herbicides and a new generation of very active herbicides is evolving. (iii) Toxicological and environmental safety requirements are increasing. (iv) Demand for many key agricultural commodities has decreased significantly as many countries that formerly imported food products became self sufficient, and (v) exchange rates have changed drastically. Each of these factors can have significant effects on the price an American or Australian farmer will pay for a herbicide.

### Discussion

Prior to discussing any of these factors in detail, the factors influencing price will be reviewed. The price charged by a herbicide manufacturer for his product is determined like that of most other types of industrial products. The first factor to consider is the cost of putting the product on the market. Terminology varies, but the basic elements are manufacturing costs, sales, marketing and technical costs, and various allocated and fixed costs (Table 1). The type of chemical and the type of company will determine the relative amounts of each grouping. A commodity producer may have a much higher percentage of their total cost allocated to manufacturing than a producer of proprietary products, who will have to pay more for research and development. However, the total cost of offering a product for sale is only one element of the pricing decision.

The actual selling price is dependent upon several factors (Table 2). During the proprietary years, cost of manufacturing may determine a minimum acceptable price, while the relative cost of competitive products or alternative methods of weed control also have to be considered. Also to be considered is a satisfactory return on the investment in the product's original research and development to allow ongoing research into new areas to be funded. If the product is unique, the value to the end user versus benefits received may be the factor that decides the selling price. After patent expiration, the introduction of generic alternatives adds another dimension to the pricing equation.

The effect of patent expiration on pricing has been studied for some time and the effect on end user pricing has varied from little change to dramatic drops in grower price. Following patent expiration, atrazine pricing in the United States was reduced by nearly 50%, as was the price of trifluralin in Australia. Other products have changed little when their patents expired. The reasons for minimal changes vary, but often competition

**Table 1** Factors influencing the cost of production and sale of an agricultural chemical

Raw materials	Cost of chemicals ingredients
Formulation materials	Solvents, adjuvants, etc.
Conversions	Cost of conversion including labour, utilities, capital costs, interest, etc.
Packaging	
Freight	
<i>Sum equals a total manufacturing cost</i>	
Market expense	Advertising, Marketing, Promotions
Field sales	Customer service, Market development
Technical	Product development, Registration
<i>Sum equals total variable marketing costs</i>	
Corporate overheads	Research, finance, etc.

**Table 2** Factors influencing pricing of commodity and proprietary products

Proprietary products	Commodity products
Cost of manufacturing	Cost of manufacturing
Cost of competitive products	Cost of competitive products
Cost of alternative methods	Cost of alternative methods
Value to end user	Value to end user
	Cost of generic product

from new products or similar products result in the product margins being reduced to the point that it is not attractive for others to manufacture the product. The current number of products that do not have patents is significant and competition from these products should ensure that dramatic increases in price do not occur.

The recent introduction of chlorsulfuron and metsulfuron has created a new standard for herbicidal activity. Ten years ago a herbicide was considered active if applied at 0.5 kg a.i. ha<sup>-1</sup>, and use rates of 4.0 to 6.0 kg a.i. ha<sup>-1</sup> were and are not uncommon. These new generation products are applied at 3 to 15 g a.i. ha<sup>-1</sup> in some situations. Many other newer products are used at rates of 0.1 to 0.2 kg a.i. ha<sup>-1</sup>. These increases in activity provide many benefits to the manufacturer and to the grower. The active materials are easier to handle and transport and would usually be less affected by sudden shifts in petrochemical prices. Raw material prices would constitute a smaller percentage of the actual selling price for very active material than one applied at very high rates. The increased competition from the new alternatives has generally resulted in growers benefiting from additional and often more efficacious choices. In many instances the new products have filled market voids, such as the selective post-emergent grass weed control herbicides now available for use in broadleaf crops.

The first three factors mentioned (petrochemical pricing, patent expiration and new highly active chemicals) are interrelated with regard to end-user price. The introduction of very active herbicides, with less dependence on petrochemicals, should take some of the pricing fluctuations attributed to changes in oil prices out of the pricing equation. The expiration of patents on the present good products should also help to keep pricing stable.

Chemical producers are now faced with more stringent toxicological and environmental requirements for new active ingredients and the re-registration of existing products. The United States Environmental Protection Agency has required that all products registered prior to 1978 be re-registered. This process, plus pressure from various anti-pesticide groups, has resulted in many products' future being questioned. Concerns about safety to the applicator, consumer and the environment are real in the eyes of the public and must be dealt with in a scientific and ethical manner. If numerous or expensive studies are

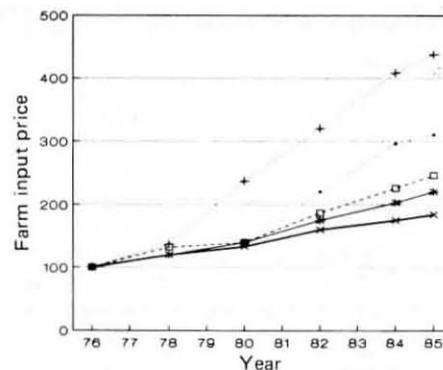
required to satisfy regulatory agencies, the manufacturer must decide whether to conduct the studies or to withdraw the product from the market.

If the product in question is a large-volume proprietary compound, then the company will probably spend the money necessary to maintain the registration. If the product has limited volumes or is not very profitable because it is a commodity or has severe competition, then it may well be removed from the market. Many older speciality products have already been withdrawn and many more will follow in the coming years, unless some changes are made to present regulatory systems.

The loss of a herbicide can often result in the grower using less effective choices or more expensive options. Sometimes the grower may not have an option. The long-term impact of increased regulation will be higher grower prices, whether it be from losing a less expensive alternative or paying more for a newly registered product.

The biggest single impact on the price an Australian grower will pay for a herbicide will probably be the strength of the dollar versus major international currencies. Since most major herbicide manufacturers are based in Europe, the United States or Japan, the relative strength of their currencies can signal immediate changes in price. The same fluctuations that give the Australian wheat grower more dollars per tonne of wheat often force him to pay more for his herbicides and other inputs. The actual increase in Australian dollars has been less for herbicides than for other inputs the grower must purchase (Figure 1). The moderate increase in herbicide price is probably due to a combination of all the factors described above. Several key patents have expired, new very active and efficacious products have been introduced and oil prices have declined. If the Australian dollar had not lost value, the increases would have been even smaller.

Another major factor relating to herbicide pricing is the farmer's ability to pay. The recent overproduction of certain commodities has placed much of the world's agricultural community in poor financial circumstances. This has resulted in growers and members of the distribution chain suffering from poor cash flow and difficulty in meeting financial commitments made a few years ago when prospects looked better for agriculture. The final impact will be larger farms, and with fewer farmers, fewer distributors and deal-



**Figure 1** Farm prices 1976-85. Farm input price index: 1976=100. (●, interest; +, fuel; \*, wages; □, machinery; x, herbicides.) (Source: B.A.E. Reports, Canberra.)

ers will be needed to service them. Such rationalization of the retail system may cause some short-term availability problems, but generally farmers still have multiple choices from which to purchase chemicals. The commodity price has a direct bearing on the type of chemical that is developed and the value to the grower. The present prices and short-term forecasts are for generally poor commodity prices. This will tend to keep herbicide prices suppressed unless new, unique, products are discovered for problems not presently solved.

## Conclusions

During the past 10 years, herbicide prices have risen less than most farm inputs. Patent expirations, new discoveries and reduced oil prices coupled with a poor farm economy have all contributed to modest price increases in real terms. The loss of some products and the possible future loss of more herbicides give cause for concern, particularly in the area of speciality crops or low-volume uses that would not justify the expense associated with repeating or conducting additional expensive toxicological or environmental studies.

In the future, broadacre farmers will continue to have economical herbicides. A broad base of chemicals now exists and new technology is being introduced. The concern about availability for speciality crops and uses is real and needs to be addressed. The major factor that will influence prices dramatically will be sharp changes in exchange rates. In general, the farmer will benefit from increased commodity prices if the dollar falls, compensating some for the increased chemical prices. The primary factor needed to ensure continual supply is a healthy agricultural economy that can afford the needed inputs to control weeds and maximize yield.