

Herbicides or poisons?

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"Ever since early man (sic) first cultivated plants and animals for food and fibre, he has been plagued by pests, and has striven to control them. Pests are not an unhappy accident of nature, but are a fundamental consequence of agricultural practice. Monocultures of selected plants and animals, assured of success by treatments designed to give maximum yields, invariably create situations which favour a particular plant or animal species. ...natural systems of living organisms achieve a degree of balance which tends to reduce or prevent great fluctuations in numbers of their constituent species... Thus man (sic), in his endeavours to change the environment to suit his own needs has created problems which he does not fully understand."
(*'Birds of Victoria and rare species'*, Gould League 1975).

"The use of integrated pest management has the advantage of reducing the range and frequency of chemicals used, placing greater reliance on biological controls and reducing the potential for resistance to develop."
(ESD Agriculture working group).

Introduction

The CSIRO has warned of several major concerns of Australian agriculture's dependence on pesticides (herbicides, insecticides etc.), "in 1988 some \$850 million was spent on these compounds... Although cost effective, some chemicals give rise to major concerns:

- the potential hazard posed by residues to consumer health,
- the threat that residues hold for exports,
- and the damage caused to the environment.

"Also, the effectiveness of pesticides is threatened by increasing resistance in target species." (CSIRO Rural Report 1990).

Unions, consumers and rural communities have voiced similar concerns regarding chemical usage in Australian agriculture. The ACF believes it is critical that all parties involved make commitments to strong initiatives to reform chemical use in agriculture in order to protect our export markets, worker health and safety and the environment. A pro-active rather than a reactive approach is called for.

In this paper, I often refer to pesticides in general, because many of the policy issues relate to the various classes of pesticides, but before considering the given question of 'herbicides or poisons?' let us consider the role of herbicides in agricultural systems. In the 10 000 years or more of cultivated food supply systems herbicides are a recent addition. Herbicides are only one option for controlling plant growth, a component of the agricultural system used for regulating unwanted plant growth. What are the other options? Have they been explored and assessed and are they adequately promoted?

In general terms the question 'herbicides or poisons?' is somewhat amusing. Clearly if herbicides were not effective in killing or restricting plant growth

(poisonous to plants at some stage in their growth cycle) they would not be effective herbicides, maybe they would not even be herbicides. Therefore I think we can vary the old saying about "one man's junk another man's treasure" along the lines of "one man's herbicide another's poison". This is of course clearly demonstrated when intensive horticultural enterprises are effected by neighbour's spray drift and valuable plants are killed.

The human, ecological and economic consequences of the extensive use and increasing reliance on herbicides raises many significant questions. Overall there is reason for serious concern. For example, atrazine is a common contaminant of ground and surface waters both here in Australia and overseas. It is frequently recorded in public water supplies throughout the world. It is the most frequently detected herbicide in the USA National Surface Water Testing Program. Perhaps more alarming is that atrazine has been recorded in rain and fog. US Geological Survey recorded atrazine in rainwater in 23 American states. It has been detected in cow's milk (Sentinel, National Toxics Network, 1995).

Atrazine is clearly a widespread environmental contaminant, but what are its effects? Given that local, regional or global systems are poorly understood nobody can really say.

Now let us turn to human health. Atrazine exposure has been associated with many human ailments from diarrhoea and rashes to cancer and reproductive problems. As usual in complex biological or ecological systems, conclusive proof is almost impossible to get.

Atrazine is not unique. Many herbicides have been implicated in the decline of rural trees and the contamination of ground and surface waters.

It is a truism that in order to determine the long term effects of agricultural chemicals they need to have been in usage for a lengthy period. This approach treats the population and the environment as a big laboratory. While trials are useful, the full effects of the chemicals on the environment and consumers cannot be predetermined and therefore, a cautious approach (precautionary) must be encouraged.

The US National Research Council's report into alternative agriculture provides clear evidence of the viability, profitability and productivity of farming techniques which have minimal chemical use, as well as documenting the significant environmental benefits of these approaches to production.

Trade issues

"We could improve our long term trading prospects by aligning our chemical registration standards with those found in the United States and the European Community." (Australia's Natural Resources, An Outlook, CSIRO, 1990).

CSIRO also recommended that agricultural chemicals which are banned in our major export markets should not be in use in Australia. This is becoming increasingly important as nations form trading blocks and look to non-tariff trade barriers as a way to restrict access to markets. Some chemicals in common usage in Australia are now banned overseas.

Germany has recently banned the use of all herbicides in vineyards, with the exception of Round Up® (NZ Growing Today 1990) in an attempt to clean up intensive agriculture. Australia's reputation as a 'clean' producer must surely be protected by programs which remain consistent with our export markets.

New Zealand has adopted a policy supporting organic agriculture by increasing research and marketing efforts into 'alternative' agricultural techniques and products.

There are considerable consumer, producer and environmental concerns about the continued use of chemicals in agriculture. To satisfy these concerns, tightening of standards for both the registration and application of agricultural chemicals is required. There is no other industry which regards the release of thousands of tonnes of toxic compounds into the environment as a right which should go unchallenged.

Australia needs to preserve its reputation overseas as a low pollution continent. This reputation has been tarnished by chemical residues in our export crops. We cannot, as a major food exporter, afford to lose our reputation. There is a market waiting to be supplied with 'pure' or 'clean green' produce, but what is required to guarantee that consumers are not buying pesticide residues in their food? And can Australia do it?

Pesticide pollution

"Water pollution is probably the most damaging and widespread environmental effect of agricultural production. Agriculture is the largest non-point source of water pollution..."

"The highest concentrations of pesticides are related to agricultural run off into streams and lakes... A number of widely used corn and soybean herbicides have been detected in rivers, many of which are used as drinking water..." (US National Research Council 1989).

I have already mentioned atrazine, but residues of many herbicides and pesticides have been found in both ground and surface waters in Australia and the United States. Concerns over the ecological consequences and the health effects on human communities relying on these waters have been raised.

The true costs of pesticides—should polluters pay?

The benefits of herbicide use in agriculture are essentially of a private nature—that is the benefits accrue to the farmer through increased yields, greater efficiency of production etc.—whereas many of the costs of herbicide use and misuse is public. These public costs are borne by the broader community through the health system and through environmental consequences, on and off farm. The consequences are almost certainly widespread and almost impossible to quantify.

A study commissioned by the UK Ministry of Environment recommended taxing of agrochemicals:

- i. as a means of applying the polluter pays principle to chemical usage,
- ii. in recognition of the environmental costs of agrochemicals (Pearce Report to Ridley, Minister for Environment).

One man's pesticide another man's poison

"Aerial spraying of crops has been the focus of community concern because of the potential for residues to drift some distance from the target crop and both industry and governments have been active in developing codes of conduct and regulations controlling this practice." (ESD Agriculture working group).

The aerial spraying of herbicides becomes increasingly controversial and divisive when rural populations become concerned about the consequences and when enterprise mixes become more diverse. Grape growing is a high value crop in many parts of Victoria. The extreme sensitivity of grapes to some types of herbicide drift at certain times of the year is an example of conflicts arising when different enterprises share a region. Incidents of spraying of non-target areas are frequently reported, including the spraying of a primary school (Nayook, Victoria,

1990) and frequent reports of spray drift into neighbouring properties. The threat of spray drifts to rural residential areas, organic farms and non-target crops indicates the need for stringent codes for aerial spraying.

This will not be easy, as recent research (Australian Cotton Growers Research Corporation 96) indicates substantial drift from aerial applications under normal atmospheric conditions. In one trial insecticide in quite high concentrations was recorded one kilometre downwind.

The ACF recommends reforms to the regulations on the use of pesticides in Australia, combined with a major public awareness program on their safe usage via:

- promotion of minimal chemical farming,
- stricter controls on application techniques,
- new and more stringent registration procedure,
- stringent testing on herbicides with existing registration and
- ongoing operator education and certification programs that focus on operator and public safety, product quality and environmental protection.

Warnings on chemicals—what is the role of government?

It is now over 25 years since Rachel Carson wrote 'Silent Spring' warning of the dire consequences of the promiscuous use of agricultural chemicals.

Perhaps what is most frightening is the continued acceptance of, research into and recommendations promoting the use of agricultural chemicals by State Government Agencies often without warning or promotion of alternatives. Throughout Australia many Government Agencies regularly recommend chemical applications as the solution to numerous land management problems in a wide variety of journals, including many industry and local rural newspapers. However there are many successful farmers practising minimal or nil chemical agriculture in virtually every industry. These practitioners and their techniques have received little official recognition. They should be acknowledged as pioneering the way for a cleaner agriculture which minimizes the social and environmental impact of chemical usage.

There has generally been minimal governmental support or encouragement of farming systems based on no or reduced levels of synthetic chemicals. Generally herbicide recommendations are based on the primary objective of ensuring maximum short term yields from pastures and crops. It would appear that chemical industries are capable of doing their own promotion and that governments' responsibility is the regulation and control

of the use of chemicals for the protection of the community and the environment.

The long term solution – reductions in usage of pesticides

In 1989 and 1990 there was an important initiative. It was an attempt by environmental and consumer organizations to bring producers and others into an extended discussion on developing a national food policy. These efforts included creating a National Pesticides Working Group. While it is some years ago, I quote extensive below from the Draft Pesticide Charter which the National Pesticide Working Group produced at the time.

"While the spotlight has been on organochlorines, there are hundreds of other pesticides in use. Many of these are more acutely toxic to humans than the organochlorines and it will almost certainly only be a matter of time before another chemical or group of chemicals returns to the media spotlight. The recent US outlawing of the apple spray, Alar[®], because of its links to cancer, resulted in its banning, spectacular media coverage in the northern hemisphere and considerable damage to the apple industry.

"The Australian Apple and Pear Growers Association and many other producer organizers have been invited to form part of a National Pesticides Working Group as a part of the development of the National Food Policy – a major initiative from the Australian Consumers Association, ACF, Greenpeace and the Total Environment Centre. These groups have sought discussions with a wide range of consumer and producer organizations to contribute to the charter. The basis of the charter is outlined below:

"All parties agree that definite and attainable targets for overall reduction of pesticide use should be established and a national program to implement such targets be developed at local level with due allowance for regional and local variations.

"As a starting point, all parties agree to explore the possibilities for achieving the following reductions in overall pesticide usage:

- i. A 25% reduction within three years
- ii. A 50% reduction within five years
- iii. A 75% reduction by year 2000.

"All parties agree that reducing the use of pesticides in food production is beneficial to consumers, growers and the environment. Alternative methods of pest control are being used successfully in Australia and abroad.

"Alternatives include:

- i. integrated pest management methods and techniques such as:
 - farmer/grower participation and education
 - ecological studies on the crop and associated organisms

- cultural practices
- population monitoring by inspection and/or lures
- rotation and inter-planting of crops
- biological control using predators and parasites
- encouraging natural predation
- intervention control methods, both chemical and physical
- pheromone controls
- limited use of selected pesticides where no viable alternative has yet been developed
- system management through computer models.

ii. organic and biodynamic approaches (which include some of the above).

“These alternatives show potential for maintenance of economic crop yields, reduction of cost to growers and reduced long-term contamination of food, soil and water supplies. They can also help reduce other undesirable impacts of pesticide use such as increased resistance in pest species and effects on non-target species and flora.” (Draft Pesticide Charter, National Pesticide Working Group).

Beyond regulation

I would be telling you nothing new to say that the agrochemical industry is viewed with suspicion by many consumers and environmentalists. However the efforts of the industry to “clean up its act” have not gone unnoticed. For example, I have publicly acknowledged that the Cotton Industry Audit and ‘Minimizing the Impacts of Pesticide Research Program’ provide important examples to other industries.

Despite these and other advances, the trust of environmentalists and the wider public will only be restored when a genuine balance is struck between environmental protection and industry development. Proven, careful and responsible use of chemicals will be essential after a decade of bad press. Fears about health and environmental effects of chemicals will not dissipate.

Rather than simply doing the bare minimum to satisfy the critics, the best direction which industry can chart is one of pioneering the world’s most environmentally sensitive and benign pest management regimes. On this front we do not know what is possible until we have a go.

Some industries are still in a state of denial over their responsibility for environmental problems – at least this is now not the case for the agrochemical industry. The decade of bad press, public criticism, environmental scrutiny, embarrassment and litigation have ensured the recognition of problems. The industry should be thankful to the vigorous campaigners who challenged the pesticide usage practices and the regulators who prosecuted water polluters. Environmental stirrers rarely get any credit but they perform a

legitimate and valuable role in getting industry and government to face the reality of its responsibilities.

Recognition of problems is the first step towards constructively finding solutions. After initial recognition there is the choice between window dressing or a commitment to turning the bad image into a well deserved good image through hard work. Collectively we must tackle the hard questions to achieve significant environmental gains. The willingness to confront each other over problems must be matched by a willingness to co-operate on solutions – to be stuck in confrontation is to miss a chance for real progress. Both confrontation and co-operation are legitimate tools in bringing industries to a recognition of its social responsibilities. However, lack of progress often results in further confrontation and calls for more stringent regulations to protect the public interest.

Regulations may provide the bottom line in standards, but can we achieve the world’s best primary industries in terms of environmental performance? What are the impediments and opportunities?

Apart from some significant ‘niche’ markets, meeting high environmental standards is unlikely to attract significant price premiums because we trade in a global economic system that ruthlessly extracts natural resources, demanding delivery at competitive prices and showing little or no respect for sustainability.

What about other advantages? Improved industry pride and better public perceptions while desirable will not pay the bills. Reduced costs may be a real incentive as pesticides are expensive. But the most important advantages will be long term. Intensive agricultural systems are showing major stress around the world. Changing course before crash testing the ecological limits avoids many negative consequences. Most agriculture in Australia still operates within a rich ecological framework – the rivers, native vegetation and wildlife are components of that framework. Unlike many industrialized countries our landscapes are not dominated by intensive ‘farm factories’. Most Australian agro-ecosystems retain remnants of former natural ecosystems and complex natural checks and balances which can be deliberately enhanced.

“In nature everything is food for something else”, as recognised by the current work on beneficial insects. With targeted research and industry co-operation we could move toward minimal pesticide use. But dramatic changes would be needed. Farms would look and function differently. New approaches will be required. To create systems that work, both economically and ecologically, requires determination, commitment, innovation and respect for nature. All available skills and

knowledge should be drawn on to accelerate this evolution.

The planet’s agricultural capacity is limited but required to supply an increasing global population. Further expansion of cropping areas is limited by water availability, climate and unsuitable soils. Improving the productivity and sustainability of agriculture is therefore urgent. Can we satisfy people’s needs without further depleting or degrading water, soil, energy and genetic diversity?

We have only really just begun exploring the challenge of clean, green farming. Will Australia’s farming industries be recognised as leaders in taking up this challenge? Minimizing the impact of pesticides is a great start in the search for productive and resilient agricultural systems which mimic nature’s diverse and complex interactions.

Let us move from minimizing impacts to maximizing beneficial relationships.