Towards a Pesticides Risk Reduction Policy for New Zealand

Summary of Submissions

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1 Introduction

This is a summary of the submissions received on the public discussion document *Towards a Pesticides Risk Reduction Policy for New Zealand*, released in April 2002.

There were 111 submissions[1] received up to early July 2002, including two reports commissioned by the Ministry for the Environment to provide a Maori viewpoint. Meetings to discuss pesticide risk reduction were held in 10 centres (Invercargill, Christchurch, Nelson, Takaka, Wellington, Greytown, Hastings – Havelock North, Tauranga, Auckland, Kaitaia) and were hosted by a variety of different groups.

This introduction contains a general analysis of the submissions by place and submitter category, and by key issues raised, roughly following the format of the discussion document.

The pesticide risk reduction process

The Government believes that there are genuine and significant concerns in the community about the use of pesticides, and that there are real opportunities to reduce the overall burden of pesticides on the environment. By working together, industry, the Government, communities and individual users can reduce risks to people and the environment, while gaining the benefits when it is necessary to use pesticides. We need to:

- review how risks are managed at the present time
- identify the risk areas where more can be done
- agree on the best means to move forward.

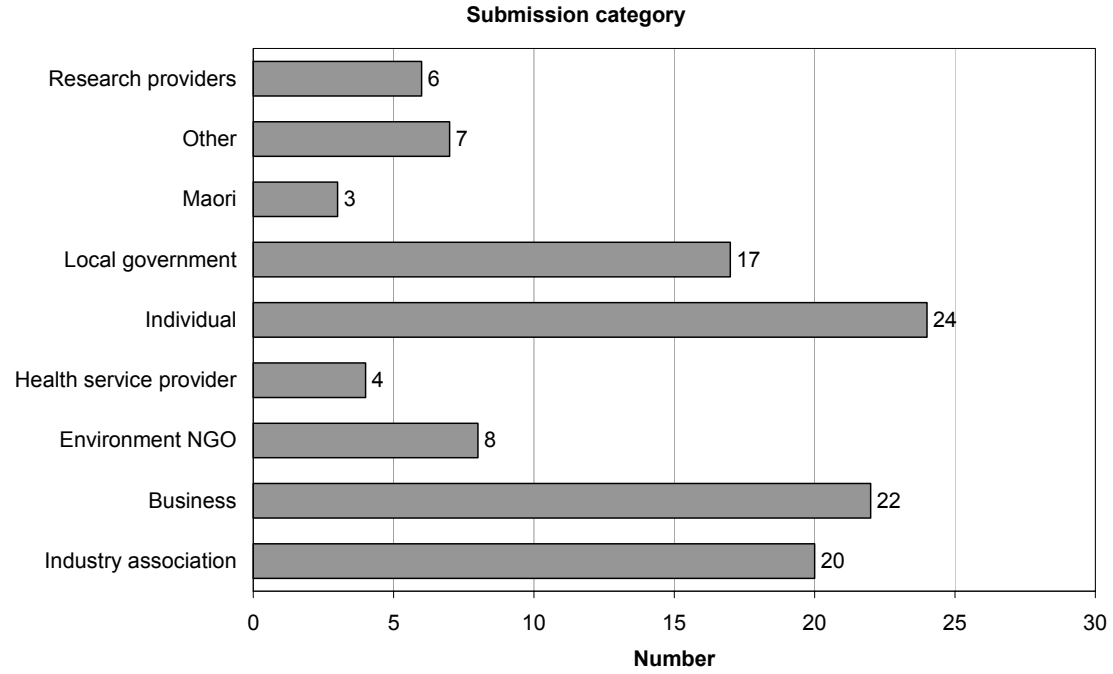
The discussion document was designed to help us all think about pesticides use and risks, and the best policies for managing them. Based on these public responses, the Ministry for the Environment will develop a set of policy options for how we might reduce the level of risk to the environment, including human health. The Government will then determine a course of action and a programme to achieve its objectives.

[1] There are 111 submissions but numbered 1–112 as one submission was entered twice in error.

General analysis

The submitters were classified into nine groups according to their background (see Figure 1).

Figure 1: Analysis of submitters, by submission category



Notes:
1 'Business' includes farms.
2 'Other' includes NZ Deerstalkers, Safe Food Campaign, National Council of Women, NZCTU, the ERMA, MAF and the Breast Cancer Network.

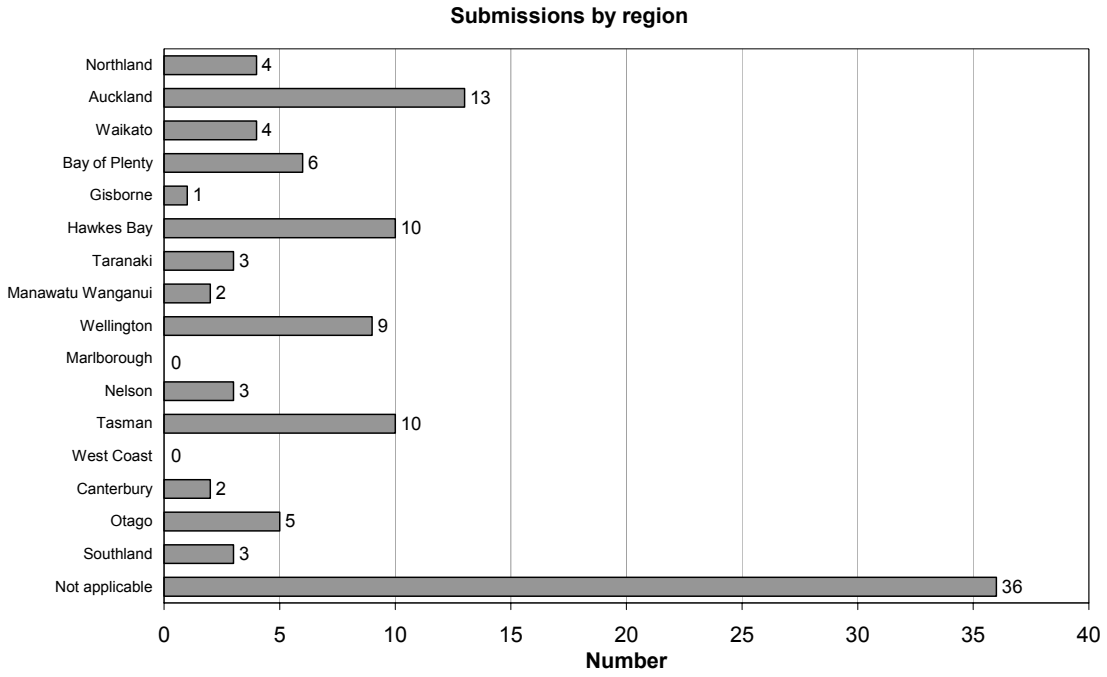
There were several strong patterns in the comments representing the different categories.[2] The business category tended to comment on issues surrounding new pesticides, funding (such as taxes) and practice issues. Individuals tended to comment on alternatives to the current pesticide use pattern, risk-reduction targets and practice issues. Industry associations tended to comment on new pesticides, risk-reduction targets, practice and (strongly) on the funding issues. Local government submissions tended to comment on data needs and (strongly) on practice issues. The six research providers tended to comment on data needs, new pesticides and funding, and (of course) research needs.

[2] Statistical analysis of the submissions was not undertaken.

Geographical spread

Submissions were received from all around the country, with a significant group coming from national organisations. There were no particular patterns of comment discernible from the different regions (see Figure 2).

Figure 2: Analysis of submissions, by region



Note: Not applicable refers to submitters that were a national industry organisation (such as Federated Farmers), or where no information on location was supplied (two submissions).

In the rest of the document we will summarise comments, using representative quotes from the submissions, by seven main headings:

- risk model
- national level policy
- the four environments
- data/monitoring/information
- animal and plant pest management
- responsible use
- research.

2 Risk Model

There were around 25 submissions on the risk model. Most submitters supported the simple model (risk = exposure x hazard) as being a useful conceptual tool.[3]

> [The simple model satisfactorily explains] the manner in which risks arise and where we should look to ways of managing risk (51 AGCARM).

There were a number of criticisms including the failure to pick up on frequency and cumulative effects, and to identify *for whom* there were risks and uncertainty.

> This type of risk [progressive accumulation of copper in soils] is not overtly described by the simple formulation of risk ... because the problem has a time-dependence ... (4 Kim)
>
> The discussion paper is not explicit as for whom there are risks and uncertainty [This submitter gave an in-depth critique of the model]. (19 Fricker)

Another group noted that measurability of exposure is critical to the usefulness of the model, and that there are scientific uncertainties around this.

> A hazard is only turned into a risk through a component of exposure ... (30 Cawthron Institute).
>
> For pesticides we believe it is the uncertainty with respect to the exposure part of the risk equation that should be the focus ... (33 New Zealand Agricultural Aviation Association).

One perspective weighed pesticide risks in comparison to other risks in life, while others pointed out that, regardless of the size of a risk, if it can be avoided, it is prudent to do so.

> The real risks posed by pesticide use are small (8 Paxman).
>
> Current levels of risk and uncertainty ... have not been well-defined (78 New Zealand Forest Owners' Association).
>
> "We are exposed to risks" is no reason why we should have more (103 Atkinson).

The model was also criticised at the more fundamental level.

> The concept ... is too simplistic and as such can lead to significant underestimation of the actual problems ... (16 Soil and Health Association of New Zealand).
>
> [The outcome of adopting this model is that] any view that pesticides need to be restricted further is dismissed as a "perception", and that only "science-based decisions" are valid (80 Safe Food Campaign).
>
> [The model] has a number of serious flaws ... an alternative model is required, based on precaution and prevention of harm (95 Greenpeace).

[3] See discussion document pp. 4–8.

3 National-Level Policy

Section 3.6 of the discussion paper used the Danish Action Plan as a 'lead-in' to consideration of national-level policy. Submissions were received on the need for legislative and institutional change, and principles that could potentially be adopted into legislation. Section 6 of the discussion paper listed four policy instruments that are already provided for in the Hazardous Substances and New Organisms Act 1996 (the HSNO Act), and that could be easily activated if the Government (and the Environmental Risk Management Authority) agreed there was a need.

The Danish Action Plan

There were 43 submissions on the case study and three distinct and opposing points of view on the desirability of New Zealand adopting a similar approach. One group considered the Danish Plan to be highly relevant and argued that New Zealand should adopt it in its entirety, including use-reduction targets and a tax on pesticides.

> Enlightened countries such as Denmark ... have taken serious and successful remedial steps ... (6 New Zealand Deerstalkers' Association).
>
> [The Plan] has many excellent features ... We are also supportive of taxes on pesticides as a disincentive to their over-use (69 Breast Cancer Network New Zealand Inc).
>
> [The Plan shows] the value of clear reduction targets and a co-ordinated programme … not only making pesticides harder and more expensive to use but also ensuring alternative approaches ... [are] ... available and understood (74 The Natural Step).

A second group thought that the Danish Plan had some relevance, showing the value of an integrated approach, but that some aspects of it may be unsuitable or unnecessary for New Zealand, or better handled in other ways.

> [A risk reduction goal is a good idea but] tonnage used is a poor measure (2 Weston).
>
> Reducing the use of pesticides alone does not necessarily mean health hazards and impacts on the environment are reduced (26 Waitakere City Council).
>
> The Plan has appeal but ... would need to be tested against a cultural framework ... (60 Te Runanga o Ngai Tahu).
>
> Aspects of the [Plan] should, in essence, already be in effect ... under current legislation ... (81 Landcare Research).
>
> ... the objectives ... appear sound and may be appropriate ... [but] a tax on pesticide sales may not be applicable in New Zealand (97 Auckland City Council).
>
> [There are] ... regular detections of chemicals in groundwater in a number of areas of New Zealand ... the Danish approach would see these chemicals being banned (in principle) (105 Tasman District Council).

A third group rejected the Danish Plan as having little or no relevance to New Zealand.

> [The Plan] is probably totally irrelevant to the New Zealand situation (9 Palmer).
>
> ... such a programme in New Zealand is quite inappropriate and would have serious economic implications (28 New Zealand Pipfruit Ltd).
>
> Federated Farmers does not support ... a strategy such as the Danish Plan described. Pesticide use and risks associated with newer pesticides are already in decline ... (86 Federated Farmers of New Zealand Inc).
>
> [The Danish Plan was agreed] as a result of very polluted ground water effecting 98% of ... drinking water. There does not appear to be any correlation with New Zealand (98 Ministry of Agriculture and Forestry).

Legislation and institutions

There were 58 submissions on this issue. The discussion paper stated:

> *The Government's view is that the present legislation and institutional arrangements must be given a chance to settle in, and that there is thus no strong case for considering major legislative reform at this stage. What do you think? Do you see areas of legislation that need to be changed, or a need for new government institutions?*

One body of submitters, including most local government submitters, agreed with the statement. They argued that the focus should be on practice, not legislation.

> ... it is not the legislation that needs to change but the practice of applying pesticides (20 Christchurch City Council).
>
> We agree ... [but] ... there is still fragmentation with the responsibility for different aspects ... now dealt with in different pieces of legislation (33 New Zealand Agricultural Aviation Association).
>
> Local governments have not yet got to grips with the [HSNO/RMA][4] interface (47 Southland District Council).
>
> Education should be all that is further required ... (75 Tropical Grass Webworm Task Group).

There were two main groups of submitters who disagreed with the present legislation, but for opposite reasons: either it was already too restrictive, or it did not go far enough.

[4] RMA = Resource Management Act 1991.

Barriers to new chemicals

Thirty submissions from growers (individuals or industry associations), chemical companies and others directly involved with pesticide developments expressed concern about barriers to the introduction of new pesticides. Submissions focussed on the application process and the cost, rather than the risk management approach of the HSNO Act.

> The registration process will in effect achieve much of the risk reduction aims ... A balance must be found between ensuring the safety of pesticides on the market, and having the pesticides available for use (101 New Zealand Winegrowers).

The submissions noted that the cost of applications was much more expensive than previously, and that preparing an application was a time-consuming process. The concern was that the New Zealand market is too small to warrant the expense of introducing new pesticides, which is a particular concern for those growing minor crops, such as vegetables, small fruit and glasshouse crops.

Some submissions noted the inequity between the expense to a company of applications for new pesticides, and the zero cost to users of the transfer process of existing pesticides. This could also mean existing pesticides will retail more cheaply than the new chemicals.

There was a strong sense through most of this group of submissions that the new, 'soft' pesticides would be better than the old, in terms of being safer and more sustainable:

> ... new pesticides generally have fewer hazards than older ones (86 Federated Farmers of New Zealand Inc).
>
> It is vital that whatever policy is chosen, the development of new, innovative pesticides with lower environmental risk [is] not stifled or restricted (94 Auckland Regional Council).
>
> ... any delay in introducing the new and scrapping the old is detrimental to our environment (2 Weston).

Many submissions assumed the new pesticides would replace the older ones, though a few expressed caution that the older pesticides should not be discarded until proven alternatives were available. Strategies were considered necessary for some of the newer more pest-specific pesticides to prevent resistance developing.

This note of caution was echoed in other submissions.

> What WaiPAC is concerned about is that we don't replicate yesterday's pesticide management in the future by using chemicals that are softer in one way but is more hazardous in other regards. Synthetic pyrethroid dip chemicals are an example where human toxicity is far safer but ecotoxicity is higher (25 WaiPAC).

Concern was also expressed that because of these barriers to new pesticide development, chemical companies have relocated off shore with a consequent loss of expertise in the area.

Several suggestions were made to address this issue, including funding applications for new pesticides, fast tracking the application process by using appropriate international data, and using a system similar to the USA IR4 process.

> Yet old chemicals transfer into HSNO at zero cost, while applications for new chemicals have to surmount a considerable cost barrier ... This is a financial issue rather than a legislative issue, e.g. it would be best addressed by a policy of subsidising costs for chemicals which have a net beneficial effect by replacing older chemicals ... (63 ERMA).

One submission did not support the "magic bullet" "reductionist" view that new pesticides would provide the solution to risk reduction.

> The continual disadvantage of assuming that more modern pesticides will solve a particular problem is that only one aspect is considered: how to get rid of a pest, without considering other aspects such as why there is a pest in the first place, what methods can be used from the immediate environment to discourage the pest, and what the effect on the environment is of using a particular strategy (80 Safe Food Campaign).

Stricter requirements needed

Another group of submissions argued that far from present policy settings being too restrictive, they are not restrictive enough. The main problem area was seen to be health, exacerbated by lack of Occupational Safety and Health (OSH) presence on farms and other workplaces. Issues raised included the lack of a liability framework to enable the funding of health treatments for victims, lack of enforcement of existing controls and weak implementation generally, and the lack of a minimum harm principle in the legislation:

> ... the Government's stated view that there is "no strong case for considering legislative reform" appears to compromise the paper's intent. This is disappointing to those who favour a more healthful environment and moves towards organic agriculture (102 Gannaway).
>
> Information from OSH will need to be readily available (34 Waikato District Health Board).
>
> If OSH is to become one of the lead agencies, then its staff need to be upskilled ... (41 Public Health South).
>
> Exposure to chemicals is clearly a very serious health and safety risk (104 New Zealand Council of Trade Unions)
>
> [There] is the need to implement health treatments for victims ... (3 McInnes).
>
> Consumers need to be better protected ... (69 Breast Cancer Network New Zealand Inc).

> ... a number of legislative changes are required ... HSNO Act to ... to require manufacturers to have liability ... HSNO regulations to provide for the keeping of written records ... not supportive of the [approach of] exposure limits; the risk benefit assessment approach used by ERMA is fundamentally flawed ... [Food Act] MRLs]should be set on the basis of safety for small children and developing foetuses ... [Health Act] An awareness-raising campaign to ensure that medical practitioners [comply with the requirement to report cases of environmental poisoning] (16 Soil and Health Association of New Zealand).

In the environmental area, a key issue was the workability of the HSNO approach of setting environmental exposure limits (EELS).

> TELs[5] and EELS, whilst appearing workable in theory, might well be impracticable ... (25 WaiPAC).
>
> ... controls ... do not seem to ensure compliance at all. Exposure limits are not satisfactory [conceptually] (103 Atkinson).

Principles

There were 24 submissions to questions raised in Section 3.7 of the paper concerning the precautionary principle. It was acknowledged that the current section 7 of the HSNO Act:

> ... is not an expression of the precautionary principle but a general exhortation to decision-makers to be cautious (63 ERMA).

One group of submitters was of the opinion that a strong statement of the precautionary principle should be incorporated into both legislation and practice, and should not be compromised by other considerations.

> [The precautionary principle] should be applied at all times with respect to pesticides. The manner in which it can be best applied is that of the decision rule of minimum harm; which provides for the use of the pesticide or method that causes the least harm to the environment ... This expression of the precautionary principle can be applied in a number of ways (16 Soil and Health Association of New Zealand).
>
> The role of the precautionary approach in substance decision making is ... an important tool but is most effective if used in combination with a systems approach, founded upon backcasting from principles of sustainability (74 The Natural Step).
>
> ... prevention of harm is paramount and should drive policy toward an aim to eliminate hazardous substances (95 Greenpeace).

[5] TELs = Toxic exposure limits.

Others were equivocal, arguing, for instance, that principles should be subordinate to the "national interest", or that while they might have relevance at higher levels of decision-making, individual users should still have flexibility to decide the appropriate course of action.

> Supports the precautionary principle with respect to hazardous substances and pesticide risk [but] ... has some concerns in relation to biosecurity threats (97 Auckland City Council).
>
> [The principle] should be applied when deciding whether a pesticide is suitable for general use ... Once released ... opportunities to monitor and/or restrict usage are limited (20 Christchurch City Council).
>
> Importantly, consideration of risks should be balanced against benefits, both financial and environmental ... (71 Environment BOP).
>
> [The principle] is valuable as an approach [but should not involve] an overly cautious approach in a situation of low risk (110 Wanganui District Council).

Another view was that the precautionary principle should be referred to:

> ... where key basic knowledge is lacking. A strong case can be made that this is not the case for modern pesticides (30 Cawthron Institute).
>
> [The principle] should be taken on board and that where impacts are unknown, for instance in combination with other substances, then use must not be supported (38 Nelson-Tasman Forest and Bird).

National-level policy instruments

Section 6 of the discussion paper listed four policy instruments: environmental user charges, transferable permits, volume reduction targets and reassessments. Each of these instruments was considered individually by submitters, while some commented on the use of policy instruments generally.

General

There were 10 general submissions opposing the use of economic policy instruments to achieve the goals of a pesticide risk reduction strategy.

> The policy instruments ... are bureaucratic and take little or no account of the technical nature of risk reduction ... (8 Paxman).
>
> If implemented, [all] would have a disastrous effect on the profitability of food production ... (55 Hellyer).
>
> The instigation [of these instruments] would inject an unnecessary complication into the overall ethic [of use reduction] ... (78 New Zealand Forest Owners' Association).
>
> ... the actual risk to be managed is quite small and is certainly not a reason for adopting more regulation or the economic policy instruments [described] (42 Taranaki Regional Council).

Environmental user charges (EUCs)

There were 40 submissions on this issue, which fell into three groups. One group, largely made up of environmental or community groups, supported the concept of a hazard-based (variable) tax on pesticides, both as a way of changing user behaviour and as a means of providing funding for use- and/or risk-reduction activities.

> ... a "mil tax" [as it is known in California] ... to fund education and research into alternatives and safer use (25 WaiPAC).
>
> [A national level instrument could have merit] depending on the hazard score of the pesticide so that there is financial encouragement to use lower risk materials (97 Auckland City Council).
>
> ... high taxes on pesticides to serve as a disincentive to their use, and a source of funding for reduction programmes (102 Gannaway).

A second group argued that the mechanism already exists in law, and said it should be left to ERMA to recommend to the Government on whether it should be applied.

> [Not much point] ... until the country has implemented education programmes to increase awareness ... (20 Christchurch City Council).
>
> There is clearly a mechanism already in place ... and it can be left to ERMA to consider the use on a case-by-case basis (42 Taranaki Regional Council).
>
> [National-level] user charges are potentially a very powerful instrument for change [but] it is important they are introduced as part of an overall programme (63 ERMA).

A third group of submitters, many of whom derived financial benefit from pesticide use, rejected the idea of environmental user charges in principle, saying that it would be counter-productive to achieving a risk-reduction goal, inequitable, and simply add to production costs.

> It seems inappropriate to enable users to continue risky practices just because they are prepared to pay (30 Cawthron Institute).
>
> ... user charges made no discernible difference to pesticide use in Denmark (51 AGCARM).
>
> ... a hopeless option. It is simply another compliance cost ... Organics would not fare well from this tax (53 Hawkes Bay Land Users Forum).
>
> The quantity of pesticide sold in New Zealand is relatively small and a tax would raise relatively little money compared with what would be needed ... (70 Crop and Food Research).
>
> [A tax] would be grossly unfair to our members who have voluntarily contributed to SWGNZ[6] (96 Gisborne Grape Growers Society).

[6] Sustainable Winegrowing New Zealand.

Transferable permits

There were 23 submissions, and virtually no support for the use of this policy instrument. Even those submitters who see the desired policy outcome as use reduction were opposed, viewing it as inefficient and ineffective compared to other instruments such as taxes and volume reduction targets.

> The Association does not support this suggestion (16 Soil and Health Association of New Zealand).
>
> It is bureaucratic and has too many difficulties (33 New Zealand Agricultural Aviation Association).
>
> Transferable permits would make it hard to balance the merits of different users (62 New Zealand Forest Managers Ltd).

Volume reduction targets

There were 43 submissions on this issue. One group of submitters saw reduced use as a the policy goal, and supported volume reduction targets as a means of getting there:

> ... in New Zealand the only way to reduce risk is to ban the chemicals (1 Palbas).
>
> ... the desired endpoint would be for the abolition of pesticides within our country (39 Jackson).

A second, larger group acknowledged risk reduction as the policy goal, but considered a volume measure (albeit hazard-adjusted) could be a useful surrogate for risk, at least at the sector or national level. Some of these submitters noted that the first step towards setting such targets is the collection of sales/use data.

> [Supports] the adoption of a national target, or targets ... for the purposes of tracking success and of stimulating national interest ... (16 Soil and Health Association of New Zealand).
>
> Good idea in principle but severely restricts the right to farm in practice. Who sets the target and at what level? (57 Hawkes Bay Fruitgrowers Association).
>
> The Authority endorses the concept of having national reduction targets ... However hazard scores need to be used with caution because they tend to be "one-dimensional" in nature ... (63 ERMA).
>
> [The first step would be] information on the production sale and use of pesticides to be collated and co-ordinated nationally ... (71 Environment BOP).
>
> In supporting an approach using a "hazard score, it is noted that the proponents (Watts, 1998) suggested this on the basis of toxic and ecotoxic characteristics. All hazardous characteristics would need to be taken into consideration (97 Auckland City Council).
>
> Any targets [must be] industry (e.g. food) based (99 TMP Consultancy).

A third group saw the policy goal as risk reduction and considered that any focus on volume reduction would detract from achieving this goal.

> Unless significant current risky practices are identified and quantified, any such scheme would be political window-dressing (30 Cawthron Institute).
>
> Risk reduction – yes; Abolition of pesticides – definitely no (47 Southland District Council).
>
> Elimination of unnecessary use [is a more appropriate concept] (66 Heinz Watties Ltd).
>
> If an instrument is required, it must be a risk-based one (78 New Zealand Forest Owners' Association).
>
> Reducing the amount of pesticide ... could possibly increase the risk of exposure ... (86 Federated Farmers of New Zealand Inc).

Reassessments

There were 24 submissions on this issue. No one disputed the need to reassess some pesticides, and the majority view was that the number of publicly funded reassessments was inadequate.

> This is the most sensible approach, [building] on the current registration system ... (30 Cawthron Institute).
>
> If there are potential problem chemicals, then they [should be reassessed]. So the management of HSNO by ERMA is critical ... (53 Hawkes Bay Land Users Forum).

Opinion varied on the ideal rate of progress and how priority for reassessment should be determined. One view was that all pesticides should be reassessed as soon as possible, starting with the most hazardous and those with significant data gaps. Another view was that lists should be developed in consultation with users to ensure that resources were not wasted on little-used pesticides.

> The current funding ... is very limited (there will be no new reassessment work in 2002/03 (63 ERMA).
>
> ... recommends all pesticides registered before the transition to ERMA be reassessed as soon as financially possible – starting with the most hazardous, the oldest registrations and those with the most significant data gaps (16 Soil and Health Association of New Zealand).
>
> prefers to see a system ... [developed] with industry input [to prevent waste of resources on reassessing little-used products] (36 Leith).
>
> An intermediate reassessment matrix could be put in place that if an individual or community group satisfied, would lead to a publicly funded [reassessment] (73 Game Forest Foundation).

It was noted that overseas experience is that pesticide companies, faced with a reassessment, will often simply withdraw a product from the market. If this occurred in New Zealand, there would be consequences for areas of use where there was no alternative control method.

Turning to the issue of how an increased number of reassessments might be funded, it was suggested EUCs should be imposed to generate the necessary revenue. Other submitters suggested there would be abuses if funds for reassessments were too readily available.

> The lack of resources for reassessments ... Carter Holt Harvey highlighted the potential for distortion between existing and new chemical approvals at the time HSNO was enacted (58 Carter Holt Harvey).
>
> ... providing more [public funding] would result in large numbers of unsubstantiated requests for reassessment ... (62 New Zealand Forest Managers Ltd).
>
> Financial constraints to reassessment must be overcome. This can be achieved through user charges ... (95 Greenpeace).

4 Four Environments

The device of setting up four 'environments' (primary production, natural and semi-natural, built and domestic) was intended to help submitters identify issues and propose possible solutions. While it is clear many submitters found it to be a useful concept, others found the device confusing and arbitrary:

> The approach of using different "environments" is a useful one (21 Stewart).
>
> The ... segregation ... into four [environments] is unhelpful to any consideration of pesticide use and risk reduction (58 Carter Holt Harvey).
>
> Use of pesticides in one environment will affect other environments ... (103 Atkinson).

Primary production

There were 24 submissions on this issue. It was noted that risks to be managed vary greatly across the subsectors of pastoral agriculture, cropping, forestry and horticulture. Even subsector groupings may be too broad, with the horticultural sector being particularly diverse.

The section was criticised for lacking unequivocal scientific information on which pesticides in which use situations were currently causing significant risks. The need is for better information and for environmental and health monitoring.

All seven risks listed in the summary table in Section 4.1.5 (contamination, loss of biodiversity, over-reliance, health effects, food safety, and short-term and strategic trade risks) were seen as important by at least one of the submitters. While some submitters did rate progress in risk reduction, it was not possible to analyse these responses in a systematic manner.

> What pesticides are we using in each environment and what effects are they having? (9 Palmer).
>
> Progress varies across sectors ... The risks that have highest priority are those of adverse health effects and off-target property damage, food safety, the production systems becoming too reliant on pesticides, loss of biodiversity and environmental contamination (16 Soil and Health Association of New Zealand).
>
> We would rate progress with risk reduction within the production environment a 10 (29 Katikati Fruitgrowers Association Inc).
>
> Our opinion is that this should be around 6 (41 Public Health South).
>
> For the forest industry: 5–6 ... For agriculture: 3–4. There are several contrasting differences ... (47 Southland District Council).
>
> [Section 4.1.5] is meaningless because there is no breakdown by industry sector (66 Heinz Watties Ltd).
>
> Horticulture is a very diverse set of crops ... Each crop will needs its own protection strategy which should include pesticide use reduction (70 Crop and Food Research).

> [With reference to possible biodiversity effects], species will not always be appropriate indicator, and other effects measures may be required ... (81 Landcare Research).

Natural and semi-natural environments

There were 19 submissions on this issue. No-one rated the risk-reduction achievement in these environments highly. Current approaches may not be sustainable in the longer term and progress towards improving practices has been slow.

On the other hand, there was broad agreement about management goals: prevention of loss of indigenous biodiversity due to invasive exotic species, and maintenance of water quality. The disagreement was over how best to achieve these goals, and the place for animal populations such as feral deer.

> ... progress in this area is non-existent and that the situation is becoming rapidly worse (16 Soil and Health Association of New Zealand).
>
> [Pesticides] are employed to reduce threats to biodiversity ... While some approaches may not be sustainable in the long term they may be the only effective short term option (20 Christchurch City Council).
>
> In our experience with marine antifouling paints, the current approach to managing risks is not very satisfactory (21 Stewart).
>
> We would rank the progress with risk management in natural and semi-natural environments with respect to pesticide use at about 5. This relatively low ranking ... stems from a belief that many of the agencies that control the use of pesticides ... in these environments do not take advantage of modern technologies designed to achieve accurate placement (33 NZ Agricultural Aviation Association).
>
> The Association has from its inception maintained a strong stand against the use of poisons ... (6 New Zealand Deerstalkers' Association).
>
> ... the first priority risk is the loss of indigenous biodiversity caused by invasive weeds and pests (83 National Council of Women of New Zealand).
>
> The ['natural and semi-natural' heading] appears to be rather a mixture of different elements ... [chemical options are essential]. Overall there needs to be a balance of pest control methods, each tailored the specific problems ... different land use values apply and aesthetics instead of economics may be dominant concerns (107 Forest Research).

Suggested ways forward included: in the short term, greater consultation between pest control agencies and the local community; and, in the longer term, development of IPM strategies, including control techniques that are more labour-intensive. Pest control budgets will need to be sufficient to enable this.

> [Problems to be addressed include]: poor tourist perceptions where herbicides are used on road verges; an IPM approach to weed control; conservation plans for indigenous ecosystems on productive land (70 Crop and Food Research).
>
> Improvement requires an increase in research and more intensive management by New Zealanders (78 New Zealand Forest Owners' Association).

> [Pesticides should be avoided in favour of less toxic methods]; local knowledge and co-operation among those affected ... cessation of all aerial spraying and drops ... [addressing the problem] ... of losing biodiversity [when herbicides are used] (80 Safe Food Campaign).

On a positive note, regional council consent processes were seen as leading to improved use of aquatic herbicides, and that ERMA's setting of EELs should manage the potential for the contamination of fresh water by pesticides.

> ... the transfer to the HSNO regime includes the setting of EELs for pesticides in water ... the ERMA assessment process ... is adequate to minimise risks [of contamination of water] (71 Environment BOP).

> ... practices in aquatic herbicide application have been gradually improving mostly as a result of the consent process required by Regional Councils ... (109 NIWA).

Built environment

There were 18 submissions on this issue. For some submitters, health risks through involuntary exposure were very important. Others rated this risk behind biodiversity loss and occupational exposure.

> We object to the document's description of communities' actual health experiences as "perceived risk" (16 Soil and Health Association of New Zealand).

> The range of pesticides "stored" was amazing ... and defied belief, therefore [we] advocate the development of a comprehensive urban education and training package ... (25 WaiPAC).

> NCWNZ considers that the highest priority risk to be managed is biodiversity loss; others are occupational exposure and the health risks from involuntary exposure (83 National Council of Women of New Zealand).

A number of opportunities were seen for central government to contribute to improved outcomes, including development of:

- IPM strategies for roadside verge maintenance and urban weed control generally
- measures of success in the area of biodiversity protection
- training programmes for contractors, managers and advisers
- education packages about alternatives to pesticides.

> Central government can assist local government by providing national guidelines and information on best practice (20 Christchurch City Council).

> Comprehensive rules for spray use by local authorities need to be imposed nationally (23 Eco-city Tauranga Inc).

> [Rates progress 1 of 10]. All applicators and those providing advisory services must hold National Certificate in Agrichemical Application, qualified and licensed that is renewable and can be suspended or cancelled (84 Haughey).

> Signage is good practice and should be encouraged. There is no need to regulate for this (110 Wanganui District Council).

> Tangata whenua have a legitimate role to play ... (60 Te Runanga o Ngai Tahu).

> There is considerable scope to manage rural road verges with minimal use of herbicides ... One way to reduce pesticide use in many urban based problems is to adopt an IPM approach (70 Crop and Food Research).
>
> Measures of success for managing biodiversity loss [should include] parklands supporting native species (81 Landcare Research).

Domestic environment

There were 19 submissions on this issue. Submitters were uniformly of the view that there are significant risk issues in the domestic use of pesticides and that these are not being adequately addressed. Only products of low toxicity should be used in the domestic environment, yet some of the products that are currently used have significant eco-toxicity. Pesticide storage, disposal of used containers and disposal of unwanted pesticides are all thought to be significant risk issues, and extended producer responsibility is called for.

> High priority risks: health of users, drift onto neighbours, disposal in stormwater drains, sewers, household rubbish collection; contamination of environment (16 Soil and Health Association of New Zealand).
>
> Home users are by an large restricted to low toxicity relatively benign products. (28 New Zealand Pipfruit Ltd).
>
> ... lockable caps that don't work well; [poor storage practice in the home]; untrained users in the domestic environment can lead to exposure issues through misuse as well as damage to property (34 Waikato District Health Board).
>
> This new approach must place emphasis on educating people (usually in domestic situations) away from the lax attitudes of [the past] (60 Te Runanga o Ngai Tahu).
>
> The most difficult problem with "domestic pesticides" is the lack of knowledge for safe disposal of obsolete stock. Collection by regional councils, with the volunteer/ technical advisory support of the pesticide industry ... [is the safest and best way to deal with this] (91 Taranaki NuChem Ltd).

A second set of issues concerned who should sell pesticides to home users and who should be able to apply pesticides in the home "for hire and reward". There was wide agreement that existing arrangements are too lax. In particular, pesticides should not be sold through supermarket outlets, and all commercial pest control operators should be appropriately qualified.

> Problems encountered ... following commercial pest control in the home environment [include] respiratory effects, nausea, and skin reactions (82 Broughton-Webb).
>
> ... the risk is very real ... Pesticides should not to be sold through supermarkets or anywhere food is sold (84 Haughey).
>
> ... endorse the proposal not to have agrichemicals available at the local supermarkets. There is no advice available normally for their use (107 Forest Research).

Patterns of domestic use of pesticides are not well known in New Zealand. The risks might well be significant in spite of few reports to health authorities. There is a need for surveys of household pesticide use and collection of data on pesticide sales.

> I do not believe that most people … are aware enough about the bad effects of pesticides ... (39 Jackson).
>
> Exposure around the home tends to produce very little public enquiry ... (41 Public Health South).
>
> While the human health risk of domestically use pesticides might well be lower ... eco-toxicity may be high. It is essential that pesticide containers adequately list the risks and use requirements (105 Tasman District Council).
>
> The sketchy data available suggests the domestic use of pesticides might be significant and should be understood more fully. This could be achieved by: survey of household pesticide use; collecting data on domestic pesticide sales (108 Koch).

5 Data, Information and Monitoring

Thirty-three submissions discussed the data, information and monitoring requirements needed to progress a pesticide risk reduction programme. This ranged from comments on the importance of identifying the 'risks' that need reducing, to the specific information and monitoring data required. All of these submissions recognised a need for more information in particular areas.

What are the risks?

Several submissions sought clarification on what the risks of pesticide use currently are, and therefore what the need for risk reduction is. One submission noted the various legislation currently in place to manage pesticide risks, and went on to query whether it had been shown that additional steps are required.

> The report paper acknowledges the lack of information on the current status of risk posed by pesticide use in New Zealand. New Zealand has to measure/quantify current risk, and benefits, before setting a plan to reduce pesticide use – at present there is an assumption that risk is too high and that despite a lack of data we should just get on and reduce – the assumption needs justifying, it is not necessarily valid across all the various pesticide users (66 Heinz Watties Ltd).

Pesticide use

Sixteen submissions specifically mentioned collection of pesticide use data, although one submission did not see this as useful to measuring risk reduction. Most of these submissions assumed that pesticide use data would be a useful measure for a pesticide risk-reduction programme. Some submissions identified subsets of data on pesticide use that should be gathered, such as for households, by region and by the four 'use environments' set out in the discussion paper.

> It is very unsatisfactory that overall pesticide use in New Zealand is not known with certainty. We believe this situation needs to be urgently resolved, so that accurate data can be obtained and any reduction or increase clearly identified (69 Breast Cancer Network NZ Inc).

Two submissions specifically referred to gathering sales data, including domestic sales data.

Monitoring

Several submissions made general comments on monitoring, including:

- the high cost of pesticides monitoring and who pays for it
- the need for hazard and exposure information
- the need for regular statistics and evaluation
- monitoring the HSNO Act
- monitoring should be related to modelling exercises.

Work on developing more cost-effective pesticides monitoring was suggested:

> ... if a particular set of policy goals was adopted by the Government a sensible first response would be to monitor the outcomes produced by the application of the HSNO Act to see if they are consistent with policy before seeking to change the regime (63 ERMA).

Environmental monitoring

Fourteen submissions identified a need for more environmental monitoring. Specific areas included surface and ground water monitoring, and biodiversity indicators. One submission identified the need for monitoring pesticides currently in use.

> The accuracy of 'exposure', which is fundamental to the risk assessment model, is in doubt when the corresponding monitoring of the environment – pesticide movement, behaviour and interaction with the various populations at risk – is missing or incomplete (89 ECO).
>
> Further information about the fate of pesticides and the significance of pesticides detected during environmental monitoring is required. Cost effective means of monitoring are also required (105 Tasman District Council).

One submission suggested there should be monitoring of the actual application of pesticides.

Health monitoring

Eleven submissions identified the need for monitoring the effects of pesticides on people, and concern for human health was seen as a key issue in several submissions. Just who should monitor health effects was also raised as an issue.

> Better collection of data about human exposure levels and health effects is required (105 Tasman District Council).
>
> We recommend that the Ministry of Health undertakes an awareness-raising programme to ensure that medical practitioners are aware of, and meet, this requirement under the [Health] Act [to report suspected environmental poisoning (16 Soil and Health Association).

Comments were made on the desirability of using international research to avoid duplicating work in New Zealand, the need to look at long-term effects of pesticide exposure, the importance of linking food residue levels with health effect work, and the need for gender analysis of data. A suggestion was made to gather data through use of Census questions.

Some submissions referred to the inadequacy of current reporting by health professionals through the Health Act requirements. Some referred to the level of monitoring of pesticides in food, suggesting this should be more comprehensive and regular.

One submission referred to concerns specifically from Maori. This was a commissioned work that involved consultation with a number of Maori groups.

> The overall issue of health effects was a recurring theme. The need was raised of monitoring food gathering sites and kiwifruit and trust block workers for rashes and health status in general etc. There was also much concern in relation to the cumulative effects of agrichemicals in Maori (112 J Hohapata).
>
> What also became apparent was the lack of data on the specific impacts upon Maori from the use of agrichemicals. Rural Maori land use is significantly different than non-Maori, yet no research focussing specifically on Maori in relation to land use and the gathering and eating of customary kai seems to be evident (Ibid.)

Worker monitoring

Three submissions specifically sought more monitoring of the effects of pesticides on workers. Baseline blood testing of workers in high-risk areas was suggested.

Two health providers referred to testing that was previously done by public health authorities.

> In pre-OSH times (<1992) the Public Health Nurses employed by the Ministry of Health offered residual pesticide testing (mainly for organophosphates) and reported the results to workers. Although simple and at times inaccurate (relied on a baseline level), it did nonetheless highlight problems in handling these pesticides to workers and spray operators. These systems are all self-regulated (*now*) to my knowledge and some control is therefore lost (not to mention loss of trend information) (41 Public Health South).

Cultural aspects

All three submissions from Maori raised issues surrounding information needs and monitoring. One submission noted the absence of any sort of 'monitoring inspector' who would observe the actual application of pesticides rather than the results of applications. The lack of monitoring of cumulative effects of pesticides, effects on non-target species and waterways, and specific effects on indigenous biodiversity such as waikakahi (freshwater mussels), frogs and tuna (eels) were noted. The identification of sites and values of significance to tangata whenua were seen as important.

Two specific recommendations were:

1) The development of an identification and classification project of Maori customary kai. The classification would indicate the degree of risk from agrichemical contamination and the associated health risk.

2) The development of rules and regulations protecting Maori customary kai from agrichemical contamination and eradication (112 J Hohapata).

These would lead to:

> Application methods and rates that protect sites and values of significance to tangata whenua and that are agreed to by the local tangata whenua (60 Te Runanga o Ngai Tahu).

Other

Other suggestions for data and information were to:

- gather information on organic farming
- improve the system for data collection on spray drift and pesticide complaints
- research people's understanding of how to use pesticides (e.g. do they read and understand the labels?).

6 Sustainable Animal and Plant Pest Management

Although some submitters pointed out that non-chemical methods of animal and plant pest management ('alternatives') are not always environmentally friendly, and that the public are not necessarily well informed about this, there was general agreement that a move towards improving sustainability is necessary.

> Where intervention becomes necessary, the primary consideration should be the sustainability of the practice (101 New Zealand Winegrowers).
>
> ... there is often a balance to be reached between the cost of non-chemical methods with fewer negative effects and the use of pesticides (97 Auckland City Council)
>
> Some alternatives to the use of pesticides ... may not be practicable or cost-effective…or can be just as environmentally damaging (42 Taranaki Regional Council).

Submissions were received on two particular management systems that have led to reduced use of pesticides: organics and integrated pest management/integrated fruit production (IPM/IFP). Claims and counter-claims were made about the merits of these two systems, and policy issues were identified concerning the appropriate role for government.

Organics

There were 25 submissions. Submitters were either supporters or opponents of the organic philosophies. Supporters were of the view that it is self-evident that organics is better for health and the environment.

> The organic industry, which we believe is the way of the future ... (38 Nelson-Tasman Forest and Bird).
>
> That New Zealanders want more organic food is a fact (27 Grierson).
>
> Organic farming is a holistic way of farming that uses no chemical pesticides ... (77 Wairarapa Organics).

Opponents did not concede this, saying that organics is not spray-free, and that heavy metal fungicides are permitted and are potentially environmentally damaging.

> ... heavy metal pesticides have gained acceptance under organic production systems because of peculiarities [in organic philosophies] (24 HortResearch).
>
> It is interesting to note the public perception of an organically grown fruit or vegetable as being "spray free" as opposed to that of a conventional crop as being "sprayed with poisons". Neither in fact is true (57 Hawkes Bay Fruitgrowers Association).
>
> There is still some confusion and misunderstanding as to what constitutes organic growing (90 New Zealand Fruitgrowers Federation Nelson-Marlborough).

IPM/IFP[7]

There were 22 submissions on IPM/IFP, mainly from IPM/IFP growers and from the science providers who have developed these systems. A number of submitters pointed to a deficiency in the discussion paper in as much as it did not highlight or quantify the gains to be made from reducing pesticide use and/or toxicity characteristics through the introduction of IPM/IFP to the horticultural industries. (This was because the discussion paper used 1998 use data, and the changes submitters are referring to have occurred since then.). It was acknowledged that these achievements are not well known outside of sector organisations, and that there is scope for publicity.

> There has been a 72% reduction in the use of organophosphates from 1996 to 2000 (57 Hawkes Bay Fruitgrowers Association).
>
> Yes there is a need to inform the consumer and critics of pesticide applications to the merits of schemes such as IPM and the grape equivalent IWP (56 Erindale Vineyard Partnership).
>
> ... individual industries are very aware of what has been achieved and can document the considerable progress that has been made over the last 15 years (66 Heinz Watties Ltd).

Some submitters raised questions about IPM/IFP, saying: there has been no survey of the benefits of IPM/IFP at the regional or national level; IPM concepts are not easily applied in sectors other than horticulture; and IPM has never been able to achieve consumer recognition to the same extent as organics (so there would be a bigger pay-off for New Zealand if available research funding were to be channelled to organics).

> ... how successful these measures have been/are needs to be assessed (81 Landcare Research).
>
> [In spite of research effort] ... IPM has little public recognition, no significant market premiums and merely maintains the New Zealand grower in the overseas market ... (54 Clearwater Research and Consulting).
>
> IPM is an attractive proposition that has been promoted most in the horticultural sector ... there has been no survey of the overall benefits ... [and] ... it is not easily applied in other sectors (107 Forest Research).

[7] Integrated Pest Management/Integrated Fruit Production.

Some policy issues

One underlying issue is the extent that subsidies should be paid to organic and/or IPM/IFP producers to achieve risk (or use) reduction goals. Such subsidies are commonly paid in European countries.

One body of opinion was that if the government is serious about risk reduction it should use policy instruments such as taxes and/or subsidies. Another view was that it is for producers and consumers to decide the merits of one system or another, and producers continually re-evaluate production system choices in the light of prices received. The Government should step in only if adverse effects can be demonstrated.

At the pragmatic level it was noted that if a subsidy were paid to organic producers (only), because organics constitutes such a small percentage of agricultural production the potential contribution to risk-reduction goals could only be small.

> We see two areas that policy makers need to concentrate on: encouraging alternatives either through subsidies or taxes; and education programmes (10 Pirirakau Inc Society).
>
> Technical assistance to help farmers to IPM or organic production ... (102 Gannaway).
>
> It is not the government's place to give preferences to particular weed and pest control strategies (28 New Zealand Pipfruit Ltd).
>
> To do so would be contrary to the RMA effects-based approach (33 New Zealand Agricultural Aviation Association).
>
> Pesticides are a cost to primary production and are therefore continually re-evaluated and reduced if possible (111 Arable Food Industry Council).
>
> Any development of organic production worthwhile as it is could be in pesticide risk reduction terms ... minuscule ... (87 Batten).

There was wider acceptance of a role for government in the funding of research into improving sustainability, and in the advocacy and dissemination of information to users.

> Experience has shown that a comprehensive IPM approach is required ... This is what the government should be funding (70 Crop and Food Research).
>
> ... the real pest ... is the overuse of pesticides ... and the hit-it-with-chemicals approach needs to be replaced ... by sustainable strategies ... (76 Stevenson).
>
> Improved pest control methods must be continually sought (78 New Zealand Forest Owners' Association).
>
> [There should be] increased support for research into alternative growing systems that do not rely so heavily on pesticide use ... (85 Hawkes Bay Regional Council).

7 Responsible Use

There were 56 submissions that referred to matters relating to the actual use of pesticides (including education).

Education, training and information

Forty-six submitters (41% of all submissions) made comments on the education, training and information requirements for those who use, work with, sell and are affected by pesticides. All of these submissions supported increased education and training. Eight of the 19 industry association submissions commented on education for users.

> Emphasis should be on education and research to achieve pesticide risk reduction in New Zealand rather than legislation and penalties (111 Arable Food Industry Council).
>
> The dangers lie in uninformed use and people taking the chemicals for granted. Although containers are required to have directions and precautions written on them, people are often lax about reading them and acting on such instructions (83 National Council of Women of New Zealand).

There was a strong push for some form of compulsion in training or education.

> Addressing these difficulties by using voluntary education opportunities, which have been available for 25 years plus, is not working. The time has come to make mandatory that *all users* be holders of the National Certificate in Agrichemical Application and Licensed (84 Haughey).
>
> Pest control operators must be trained and registered in the use of pesticides (69 Breast Cancer Network New Zealand Inc).

Submitters commented on education for domestic users.

> Domestic consumers also need to be educated about the risks associated with a wide range of pesticides, so they can make informed decisions about appropriate pesticide use (71 Environment BOP).
>
> Education of home pesticide users needs to be stepped up; i.e.
>
> - mandatory information leaflets to supply with a product
> - review of labelling requirements to make instructions more fool-proof
> - manufacturers to produce labels that do not fade, nor are easily spoiled
> - label to highlight the effects on non-targets; beneficial insects; drains; adjacent plants
> - training and licensing of retailers selling pesticides.
>
> Restrict the range of available pesticides (108 Koch).

Comments were also made on training and licensing commercial pesticide users.

> All persons that in the course of their livelihood use pesticides should be registered (similar to a firearms licence) (68 Mrkusic).
>
> Many users don't know how to calibrate spraying equipment resulting in under/ over applications (84 Haughey).

Comments were made on providing education and information on alternatives to pesticide use.

> Ministry for the Environment:
>
> - can encourage territorial authorities which are significant users of pesticides to increasingly utilise non-chemical control options, even outside the built environment (43 Otago Regional Council).
>
> Good quality educational material for gardeners and home-owners covering the major problems should emphasise the alternatives to pesticides such as hygiene for ants indoors (70 Crop and Food Research).

The ability of people to purchase pesticides and to make purchases at food retail outlets was commented on in 20 submissions.

> However, an area of concern is the ease at which the general public have access to some of the toxic pesticides with no education as to their application, residue parameters, or safe storage protocols (72 Shepherd Vineyards).
>
> Our code for storage of chemical is higher than shops, especially garden centres, yet we do not have the public coming into our storage areas, nor do we store much chemical compared to a shop. Chemical storage should be the same for shops as chemical applicators (61 Rhodesway Services Ltd).

Several submissions wanted a ban on selling pesticides in supermarkets and food outlets. Submitters also sought to require training of shop staff in the uses and potential adverse effects of pesticides, so that they could inform customers. Several submissions sought to have pesticides sold only to qualified users.

There was also a perceived need for general information, including better labelling, more realistic advertising (using safety equipment etc), and an 0800 number with information on proposed pesticide applications.

> One agency responsible for the supply of information on things like
>
> - the findings of the latest research
> - best practice techniques and practices, and
> - alternatives to pesticides etc
>
> (85 Hawkes Bay Regional Council).

Application of pesticide

Several submissions referred to improvements in the application of pesticides that should be made. These were from people who had practical experience in the pesticide application process.

> The risk reduction strategy in New Zealand should extend to cover more of the practices and equipment used to administer and apply the pesticide ... no real risk occurs until the pesticide is used ... adverse environmental effects arise largely because the pesticide has not been entirely confined to the target (33 New Zealand Agricultural Aviation Association).

Use of the best technology available was suggested, with two submissions referring to through-volume booms for aerial spraying and air-induction nozzles, as well as the use of geographical information systems (GIS) and global positioning systems (GPS) for pesticide applications.

One submission even suggested the development of a "spray coverage tool", such as an ultraviolet dye, so that applicators could see where they have sprayed.

Banning use of aerial drops of chemicals classed as S4 poisons (e.g. 1080) was seen as a risk-reduction measure. Various submitters thought it would be useful to:

- develop risk assessment tools, such as exposure prediction tools
- have a warrant of fitness for pesticide application equipment
- keep records of use
- consult early with tangata whenua, which was seen as helpful in planning pesticide applications.

One experience of local consultation had been that the local community: was able to express its concerns; be kept well informed and suggest improvements to pest control programmes.

National guidelines

Twelve submissions commented on national guidelines and planning issues, including buffer zones. Buffer zones were seen as useful by a number of submitters, with a range of views of how they might work. The comments related to the discussion in the paper and referred to waterway buffer zones.

> Buffer zones along waterways offer an opportunity for creation of indigenous ecosystems and making a contribution towards indigenous biodiversity. They also provide a carbon sink which would be in line with the climate change policy (70 Crop and Food Research).
>
> We support the use of buffer zones along watercourses and around lakes, and believe this could be of great value in a New Zealand policy (16 Soil and Health Association of New Zealand).
>
> Buffer zones may be beneficial if it is shown that chemicals are entering waterways, these zones may severely limit production, especially on smaller properties (32 Richards).

> It is interesting to note the USA experience of (Danish) pesticide prohibition around water margins that has resulted in such dense weed growth that drinking domestic and wild animals and recreational fishermen have been unable to access the water (87 Batten).

The identification of sensitive and significant sites was seen as useful in some submissions, particularly to identify sites of importance to tangata whenua.

One submission referred to Australian experience:

> The use of pesticides, particularly at land-use boundaries, is a very real problem in a number of countries ... To date, the Australians have found that the most successful approach has been to get the people involved to discuss the problem and attempt to find resolutions. Regulation has not been an effective mechanism (98 Ministry of Agriculture and Forestry).

Several submissions wanted national guidelines and standards, or codes of practice to assist better practice. The GROWSAFE® code (NZS 8409) was commented on by a number of submitters, with many seeing a need for further development and promotion of the code. Some called for its review or audit, including how the training programmes are delivered.

A nationally co-ordinated and funded programme for monitoring to get nationally consistent data was suggested in one submission. A recommendation was made for model provisions for district plans on territorial authority functions under the HSNO Act. Other submissions asked for nationally consistent comprehensive rules for resource management plans on pesticide use. An apple producer working to a range of production standards asked for:

> ... a robust primary production standard that can be used as a minimum in terms of production systems for all producers (22 Mr Apple New Zealand Ltd).

Enforcement

Four submissions commented on the need for adequate enforcement of pesticide use, including the following.

> Enforcement of minimum standards of health and safety in the workplace is essential (104 NZ Council of Trade Unions).

> Heavy reliance has been placed on monitoring the results after application rather than equally assessing the operator at the time of use (60 Te Runanga o Ngai Tahu).

Disposal

Five submissions made comments on the importance of the proper disposal of pesticides. For example:

> Associated with this issue though is the responsibility that producers must also take in assisting in the safe disposal of containers of used, deregistered and unwanted pesticides (60 Te Runanga o Ngai Tahu).

Other

Several submissions saw biosecurity development as an area that required more attention to stem the pest problem before pesticides were needed.

IPM production systems were seen as a good model for risk reduction, and which should be expanded to more crops and other pest control systems. A step towards using IPM could be to develop "multi-tactic crop protection manuals" for a range of crops.

Comment was made on the need for technology-transfer research (separate from new research areas) to disseminate information widely.

One submission referred to the work of the Agrichemical Trespass Ministerial Advisory Committee, and that its recommendations should be implemented.

Banning the use of sewage sludge in compost was seen as necessary to avoid pesticide contamination.

Recommendations were also made for:

- a robust and regular food-testing programme
- an improvement to worker health and safety
- tangata whenua to be used as pesticide applicators in significant and sensitive areas.

8 Other Comments

Specific chemicals

While many submissions referred in passing to individual pesticides or groups of pesticides, some submissions provided more detailed recommendations on particular pesticides.

Several submissions pointed out the problems of accumulation of metals from pesticides, resulting in lowered production and possible ultimate sterilisation of the soil. This applies across a range of pesticides (e.g. copper-based, dithiocarbamates, etc). A risk reduction aim should be to minimise the rate of accumulation of metals caused by pesticide use. This is also seen as a problem for organic farmers, and includes the use of lime-based pesticides.

Paraquat and diquat controls were seen as needing amendment, particularly their use in water and their accumulation in soils, and updating the label information.

One submission focused on marine anti-fouling paints, which contain a range of ingredients including copper and organic booster biocides. It was suggested that these substances should be carefully considered during the transfer process to ensure that protection of the marine environment is adequate.

Insect growth regulators and juvenile hormone analogues were seen as only a 'staging post' along the way to 'mature' IPM because of their risks of insect resistance, environmental persistence, and human health issues.

Fumigants were seen as needing a review before they have been transferred to the new HSNO regime.

Many submissions referred to the use of vertebrate pesticides. The recommendations varied, but included:

- no poisons should be used to kill game animals
- trappers should replace 1080 drops
- aerial applications should cease and ground control should be stepped up
- all vertebrate poison applications ought to require resource consent with specialised consent hearings panels.

Comment was made on the alternatives to 1080:

> It is rather ironic that the risk management of 1080 is probably the most sophisticated of any pesticide in New Zealand because of the quality and completeness of the scientific information about it, and yet many people have strongly negative perceptions of its use. The alternative vertebrate poison brodifacoum has a very low public profile, but DOC has restricted its use because of concerns about its persistence in terrestrial food webs (21 Stewart).

9 Research

There were 32 submissions received on this issue. Submitters felt that the Pattle Delamore *Pesticide Research Review* (one of the background studies for the discussion paper) was useful but incomplete.

> The Pattle Delamore Partners Ltd study ... there appear to be other omissions ... For instance ... current research on timber treatment chemicals ... (19 Fricker).

A number of submitters called for a co-ordinated approach to research as being the key tool to risk reduction:

> ... a cohesive and co-ordinated approach to funding research is needed, so that the gaps in our knowledge about pesticides in New Zealand already identified by MfE are targeted (89 ECO).
>
> Properly funded and co-ordinated plant protection research can lead to solutions ... (24 HortResearch).

It was seen as ironic that the release of the discussion paper coincided with an announcement that FRST funding for HortResearch's IPM programmes was to be cut. Public funding was necessary because research outputs quickly become public domain. Some felt the role of government is to partner the private sector.

> It is ironic that ... government is ... cutting off the funding of ... HortResearch (57 Hawkes Bay Fruitgrowers Association).
>
> The focus of government should be ... to reverse the current trend of reducing research into pest and disease management ... (64 New Zealand Asparagus Council).
>
> Government should be partnering horticultural industry initiatives to develop and enhance IPM ... (79 The National Organisations for Fruit and Vegetable Growers).

Possibly with reference to the current debate around 1080, one submitter saw a "confidence gap" between scientists and the public. Another submitter thought there was insufficient consultation with the public on research directions.

> Endeavour to bridge the confidence gap between scientists and the mainstream public (82 Broughton-Webb).
>
> Could the public have a say in what research is being done for the public good (103 Atkinson)

Turning to the kind of science that should be done, submitters seemed to focus on the area of risk they themselves were most familiar with, to the exclusion of other areas of risk. Health-focused people argued for complementary medicine and quick-test tools.

> New Zealand ... would benefit from greater research in the area of how complementary medicine can assist with the diagnosis and treatment of chemical poisoning ... (16 Soil and Health Association of New Zealand).
>
> ... a "quicktest kit" which would enable easy and timely identification of pesticide damage ... (23 Eco-city Tauranga Inc).

> There is too little research on the long-term effects of pesticides ... (10 Pirirakau Inc Society).

In horticultural production, there was support for more research on biocontrols.

> The effective use of beneficial wasp species ... and beneficial species of micro-organisms that reduce the number and impact of pathogens (54 Clearwater Research and Consulting).
>
> We require support ... to speed up the introduction of more beneficial predators (56 Erindale Vineyard Partnership).
>
> Ensuring that effective alternatives are available, attractive and understood will require action from researchers ... (74 The Natural Step).

In the area of natural and semi-natural environments, it was argued that we need studies assessing effects, including information on the toxicity of pesticides to native species, and pest control methods not involving toxins.

> For many pesticides, very little research has been done on their environmental effects (71 Environment BOP).
>
> ... the standard tests may not actually capture potential toxicity to non-standard native species (81 Landcare Research).
>
> The priority for research is into methods of pest control that do not involve toxins (73 Game Forest Foundation).

Appendix: List of Submitters

Submission number	Surname	Company name
1	Palbas	
2	Weston	
3	McInnes	
4	Kim	
5	Renouf	
6	Brown	New Zealand Deerstalkers Association
7	Pugh	
8	Paxman	
9	Palmer	
10	Rolleston	Pirirakau Inc Society
11	Webb	
12	Thompson	Ashburton District Council
13	Smith	Elliot Chemicals Ltd
14	Campbell	
15	Petley	
16	Watts	Soil and Health Association of New Zealand
17	Lowry	Fletcher Challenge Forests
18	Harrey	
19	Fricker	
20	Moody	Christchurch City Council
21	Stewart	
22	Jones	Mr Apple New Zealand
23	Webber	Eco-city Tauranga
24	Suckling	HortResearch
25	McBride	WaiPAC
26	Bodmin	Waitakere City Council
27	Summerhays	
28	Butcher	New Zealand Pipfruit Ltd
29	Hunkin	Katikati Fruitgrowers Association

Submission number	Surname	Company name
30	Holland	Cawthron Institute
31	Albertyn	Franklin District Council
32	Richards	
33	Maber	New Zealand Agricultural Aviation Association
34	Blake	Waikato District Health Board
35	McLean	
36	Leith	
37	Falls	Organic Pipfruit Growers of New Zealand
38	Campbell	Nelson-Tasman Forest and Bird
39	Jackson	
40	Clothier	HortResearch
41	Shand	Public Health South
42	Chamberlain	Taranaki Regional Council
43	Selvarajah	Otago Regional Council
44	Corbett	
45	Robertson	
46	Mason	Bush Community Board
47	Sarfaiti	Southland District Council
48	Hermunssen	Pest Management Association of New Zealand
49	Shaw	Kapiti Coast District Council
50	Petch	Environment Waikato
51	Richardson	AGCARM
52	Enright	Pan Pac Forest Products
53	Hoy	Hawkes Bay Land Users' Forum
54	Clearwater	Clearwater Research and Consulting
55	Hellyer	
56	Sage	Erindale Vineyard Partnership
57	Dames	Hawkes Bay Fruitgrowers Association
58	Parrish	Carter Holt Harvey
59	Robinson	
60	O'Connell	Te Runanga o Ngai Tahu
61	Rhodes	Rhodesway Services Ltd

Submission number	Surname	Company name
62	Murphy	NZ Forest Managers Ltd
63	White	ERMA
64	Ward	NZ Asparagus Council
65	Gaw	Public Health, Auckland District Health Board
66	Kale	Heinz Wattie Ltd
67	Sloan	
68	Mrkusic	
69	Woods	Breast Cancer Network New Zealand Inc
70	Tocker	Crop and Food Research
71	Mandemaker	Environment BOP
72	Shepherd	Shepherd Vineyards
73	Ottman	Game Forest Foundation
74	Roberts	The Natural Step
75	Rawnsley	Tropical Grass Webworm Group
76	Stevenson	
77	van Steensil	Wairarapa Organics
78	McLagan	New Zealand Forest Owners Association
79	Silcock	New Zealand Fruitgrowers Federation and Vegfed
80	White	Safe Food Campaign
81	O'Halloran	Landcare Research
82	Broughton-Webb	Hutt Valley District Health Board
83	Glenie	National Council of Women
84	Haughey	
85	Bramwell	Hawkes Bay Regional Council
86	Petrey	Federated Farmers
87	Batten	
88	Joel	Save Mahinerangi Society
89	Sutherland	ECO
90	Kempthorne	New Zealand Fruitgrowers Fed Nelson-Marlborough
91	Mason	Taranaki NuChem Ltd
92	Parnell	
93	Roberts	The Natural Step (Duplicates 74)

Submission number	Surname	Company name
94	Grogan	Auckland Regional Council
95	Connor	Greenpeace
96	Egan	Gisborne Grape Growers Society
97	Taylor	Auckland City Council
98	Burdon	Ministry of Agriculture and Forests
99	Patterson	TMP Consultancy
100	Ensor	NZAET
101	Manson	New Zealand Winegrowers
102	Gannaway	
103	Atkinson	
104	Lloyd	New Zealand Council of Trade Unions
105	Baker	Tasman District Council
106	Gray	
107	Zabkiewicz	Forest Research
108	Koch	
109	Clayton	NIWA
110	Munneke	Wanganui District Council
111	Dick	Arable Food Industry Council
112	Hohapata	