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ETHICAL PESTICIDE POLICY: BEYOND RISK ASSESSMENT

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A thesis submitted for the degree of

Doctor of Philosophy,

The University of Auckland,

December 2000
Abstract

This thesis sets out to develop a pesticide policy process that is ethical, one that fairly addresses the needs of society whilst at the same time minimizing the impact of pesticides on nature. The process that is developed here is context dependent: it is not a prescription for all public policy processes, but one specifically for pesticides in one country at a particular period in time. Nevertheless, the general principles are widely applicable to other areas of policy, particularly those involving technological risks, and to other countries. Much of the material used is drawn from the New Zealand experience, with two major exceptions: United States data is used to describe the toxicological risk assessment process and its failures, and studies conducted in Asia are used to illustrate community participatory research. The development of Auckland City's Weed Management Policy is used to illustrate the potential of the proposed approach to pesticide policy.

It is argued that the reductionist science of toxicology, on which current pesticide policy heavily depends, fails to accurately predict the effects of pesticides on human health and on the environment. It is shown to be based on a particular set of values that cannot be said to represent those of society in general. These two factors contribute significantly to the differences in the acceptability of risks from pesticides by lay people and by technical experts. There are also gender and race differences in assessment of risk.

It is argued that to base pesticide policy on toxicology is irrational because this science fails to incorporate ecological rationality, i.e. the interconnectedness of nature, and social rationality. It is also argued that pesticide policy based on the anthropocentric approach of the domination of nature, which broadly underlies the mechanistic worldview of science, is unethical because it fails to take into account the needs and interests of nonhuman nature. Ethical pesticide policy is therefore based on ecological rationality (as well as social rationality) and a recognition of the intrinsic interests of nature, both aspects of an ecocentric ethic. The ecocentric ethic is practically applied to pesticide policy processes by using the decision rule of the principle of minimum harm, which is an expression of the precautionary approach.

The objectivity and cultural authority of science are challenged and the way is cleared for the introduction of other knowledge into the ethical pesticide policy process. It is scientism, not science that is rejected, and science takes its place alongside other knowledge systems. Wisdom is incorporated into the policy process by including the knowledge of members of the community and of public interest groups who have
understanding and experience of the effects of pesticides, and also the management of pest, weeds and disease in agri-ecosystems in ways that minimize harm to nonhuman nature, principally by the methods of organic agriculture and natural farming.

Democracy is improved by including in the decision-making those who lie in the path of the policy: public interest groups that bring expertise, experience, and social values, farming interest groups that bring the views of those who use pesticides and those who manage the agri-ecosystem without them, and the appropriate bureaucrats. The pesticide industry is not included in the decision-making group for ethical reasons. The tripartite approach is augmented by a person representing the interests of nonhuman nature, an ecocentrist whose role it is to ensure that the principle of minimum harm is adequately applied. This is an acknowledgement of the need for considerable attitudinal change, particularly on the part of bureaucrats and pesticide users, in order that the ethical pesticide policy process lives up to its potential. Distributional justice issues are addressed by requiring that the policy decision-making group consists of 50 percent women/50 percent men, and 50 percent pakeha/50 percent Maori, to reflect firstly the gender differences in the acceptability of risks from pesticides, and secondly the bi-cultural nature of New Zealand as afforded by the nation's founding legal document, the Treaty of Waitangi.

Supervisor: Dr Bruce Hucker

Academic Advisor: Ms Prue Taylor
Acknowledgements

This thesis has arisen out of ten years of work on behalf of the community on pesticide issues, including six years as a member of the Pesticides Board and nine years as a member of the Steering Council of Pesticide Action Network Asia and the Pacific. During those years I have had ample opportunity to witness the failure of pesticide policy to address the needs of many members of society, and to learn from the experience and expertise of individuals and organizations too numerous to name, within New Zealand, Asia, United States and England. Special thanks go to the Toxins Awareness Group in New Zealand whose perseverance and insistence on preventing unnecessary exposure of the public to herbicides paved the way for the Auckland City Weed Management Policy, the development of which provided valuable insight; and to Pesticide Action Network Asia and the Pacific and its network partners for their wisdom, courage and expertise.

Special thanks also to the Soil & Health Association of New Zealand for financial support, for the opportunity to write this thesis, for the opportunity to work on behalf of the pesticide-affected community, and for the sixty years of accumulated experience in managing pests, weeds and disease in ways that minimize damage to humans and the wider environment.

My gratitude also to my supervisor Dr Bruce Hucker and academic advisor Prue Taylor of the Department of Planning for their invaluable input, to the staff of the University of Auckland libraries for their willing assistance, particularly the Architecture Library, and to the administration staff who never failed to help. I am indebted to my reviewers who, presented with isolated chapters, nevertheless made sense of it and provided valuable comments: Professor Klaus Bosselmann of the University of Auckland, Drs Deborah Moore and Mary O’Brien of the USA, and Dr Karin Meissenburg of Hamburg and Orkney. Any errors are my own and despite their kind assistance.

Finally, my deepest thanks go to my partner Jo Davies for making it possible, and to other members of my family for their support, understanding, and encouragement.
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Abbreviations

ACVM Agricultural Compounds and Veterinary Medicines:
- Act 1997
- Group
- Unit
ADI acceptable daily intake
ADE acceptable daily exposure
AGCARM Agricultural Chemical and Animal Remedies Manufacturers Assoc.
AVMAC Agricultural Compounds and Veterinary Medicines Advisory Group
BOD biological oxygen demand
CACOC Chief Agricultural Compounds Officer, Ministry of Agriculture
CDI chronic daily intake
CNS central nervous system
COD chemical oxygen demand
DDT Dichlorodiphenyltrichloroethane, an organochlorine insecticide
DES diethylstilbesterol
DoC Department of Conservation
EC50 environmental concentration of a pesticide required to kill 50 percent of a test population
EDSTAC Endocrine Disruptor Screening and Testing Advisory Committee
ERMA Environmental Risk Management Authority
FMFAF Federal Ministry of Food, Agriculture and Forestry, Germany
FQPA Food Quality and Protection Act 1996 (USA)
GATT General Agreement on Tariffs and Trade
HortResearch Horticulture and Food Research Institute of New Zealand Ltd
HQ hazard quotient
HSNO Hazardous Substances and New Organisms (Act 1996)
IDS integrated defense systems
IPCS International Programme on Chemical Safety.
IPM integrated pest management
IUCN International Union for the Conservation of Nature
IWMCS Interagency Workgroup on Multiple Chemical Sensitivity
LC50 concentration of a pesticide required to kill 50 percent of a test population
LD50 dose of a pesticide required to kill 50 percent of a test population
LOEL lowest observed effects level
### Ethical Pesticide Policy: Beyond Risk

**Assessment**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>MAF</td>
<td>Ministry of Agriculture, and variously Fisheries or Forestry depending on date</td>
</tr>
<tr>
<td>MCS</td>
<td>multiple chemical sensitivity</td>
</tr>
<tr>
<td>MfE</td>
<td>Ministry for the Environment</td>
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<tr>
<td>MoH</td>
<td>Ministry of Health</td>
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<tr>
<td>M-WRC</td>
<td>Manawatu-Wanganui Regional Council</td>
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<tr>
<td>NOAEL</td>
<td>no observed adverse effects level</td>
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<tr>
<td>NOEL</td>
<td>no observed effects level</td>
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<tr>
<td>NRDC</td>
<td>Natural Resources Defence Council</td>
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<td>NRC</td>
<td>National Research Council</td>
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<td>NAS</td>
<td>National Academy of Science</td>
</tr>
<tr>
<td>OECD</td>
<td>Organization for Economic and Cultural Development</td>
</tr>
<tr>
<td>PAN NA</td>
<td>Pesticide Action Network North America</td>
</tr>
<tr>
<td>P/CCRARM</td>
<td>Presidential/Congressional Commission on Risk Assessment and Risk Management</td>
</tr>
<tr>
<td>PCP</td>
<td>pentachlorophenol, an organochlorine wood treatment pesticide</td>
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<tr>
<td>PHC</td>
<td>Public Health Commission Rangapu Hauora Tumatanui.</td>
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<tr>
<td>ppm</td>
<td>parts per million</td>
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<tr>
<td>ppb</td>
<td>parts per billion</td>
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<tr>
<td>PRS</td>
<td>pesticide rating system</td>
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<td>RfD</td>
<td>reference dose</td>
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<td>RMA</td>
<td>Resource Management Act 1991</td>
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<tr>
<td>SF</td>
<td>slope factor</td>
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<tr>
<td>TEL</td>
<td>tolerable exposure limits</td>
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<tr>
<td>TWPCRASC</td>
<td>Technical Working Party on Carcinogen Risk Assessment for Soil Contaminants</td>
</tr>
<tr>
<td>TT-WTWT</td>
<td>Talking Technology – Whiriwhiri Tahi, Whakatau Tahi</td>
</tr>
<tr>
<td>US EPA</td>
<td>United States Environmental Protection Agency</td>
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<tr>
<td>US FDA</td>
<td>United States Food and Drug Administration</td>
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<tr>
<td>WHO</td>
<td>World Health Organization</td>
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</table>
Glossary of Māori words and terms

The definitions given below are those provided by Williams' (1975) Dictionary of the Māori Language, unless otherwise specified, in which case the meaning provided is consistent with the context within which the word or expression was used.

Hapu sub-tribe
Kaitiakitanga the exercise of guardianship by the tangata whenua of an area in accordance with tikanga Māori in relation to natural and physical resources; and includes the ethic of stewardship (Resource Management Amendment Act 1997, section 2(4)).
Karakia a form of spiritual expression (Jarman et al. 1996)
Mana vested with authority, influence or power
Mana putaiao interpersonal responsibility (Jarman et al. 1996)
Mana tangata personal integrity, described by Jarman et al. (1996) as ensuring that "our actions have significance and we do not entertain wanton and callous destruction, or depletion of resources simply because we have a short term 'need'" (p.94).
Mana whenua having authority over the land
Mauri life principle
Mauriora life principle, same as mauri.
Pakeha person of European descent
Papatūanuku Earthmother (Jarman et al. 1996)
Taonga highly prized, treasure
Tangata whenua local people, literally people of the land
Tapu under a restriction of a religious nature, often referred to as sacred
Tikanga Māori cultural and spiritual norms; defined by the RMA as meaning Māori customary values and practices
Tino rangatiratanga an obligation, a duty and a commitment to interact with our world in the most responsible and appropriate way we see fit, in order to fulfil our needs (Jarman et al. 1996).
Tipuna ancestor, same meaning as tupuna
Tupuna Māori ancestors of the Māori people
Waahi tapu sacred place
Whakapapa common descent (Jarman et al. 1996)
Whanaungatanga kinship-like relatedness (Jarman et al. 1996)