

# Regulating by stealth: reducing the OSH impact of pesticides

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## Abstract

Exposure to pesticides poses a serious, albeit largely incalculable, threat to the health of agricultural workers worldwide.<sup>1</sup> Incremental reforms to the regulatory status quo at national level may somewhat mitigate the problem. However, this paper argues that greater opportunities for improving agricultural occupational safety and health and pesticide safety lie outside the boundaries of the traditional regulatory system, through harnessing the potential of new agricultural and pest control technology, the market forces driving global food production, and powerful forces within civil society capable of changing community attitudes to risk and safety. These instruments will be most successful when they form part of an integrated strategy underpinned by regulation and state intervention. Notwithstanding the retreat of the regulatory state, governments have a pivotal role in harnessing and shaping these forces to improve agricultural occupational safety and health in what might be termed 'regulating by stealth'.

## Key words

**Agricultural chemicals, civil society, hazardous substances, non-governmental organisations, pesticides, public policy, regulation legislation, regulatory pluralism**

## Introduction

Agriculture is one of the most hazardous industries in both developing and industrialised countries. In 1997, the International Labour Organisation (ILO) warned that, globally, agricultural workers 'run at least twice the risk of dying on the job as workers in other sectors' and noted that this disproportionate level of risk is not restricted to agricultural workers in developing countries.<sup>2</sup> In the EU<sup>3</sup> and in Australia,<sup>4</sup> agriculture ranks as one of the most hazardous industries, and in the USA, per person occupational injury costs for farming are approximately 3.2 times the national average.<sup>5</sup>

There are many facets of agricultural production that contribute to this bleak picture. Of these, exposure to pesticides is certainly one of the most significant. But how significant remains unclear because of almost insurmountable difficulties in documenting the true extent of pesticide poisoning and its impact on the agricultural workforce. There are a number of reasons for this. First, the contingent nature of much of the agricultural workforce worldwide makes it extremely difficult to document many exposures, injuries and health problems. In Australia for example, the agricultural workforce consists mostly of self-employed family members or contractors rather than employees, with the result that only a small proportion of work-related farm injuries end up in workers' compensation claims.<sup>6</sup> Second, the available statistics refer almost exclusively to acute exposure and rarely capture work-related disease

resulting from long term, chronic exposure – not least because of the long latency period between exposure and the onset of disease. It is therefore not surprising that the ILO claims that this problem is ‘notoriously underestimated’ although acknowledging it as a ‘frequent occupational hazard’ for farm workers globally,<sup>6</sup> while the World Health Organisation (WHO) estimates that worldwide between 2 and 5 million work-related pesticide poisonings occur annually.<sup>7</sup> One may conclude that, notwithstanding our limited knowledge of its precise dimensions, exposure to pesticides remains a problem with serious OSH implications.

How should the challenges of reducing the OSH impact of pesticides best be approached at a policy level? Elsewhere, focusing on Australia, we have argued that the traditional regulatory approach to chemical safety and OSH in agriculture is seriously flawed – as indicated by the failure to stem excessive rates of work-related injury, disease and loss of life in agricultural workplaces.<sup>8</sup> We suggest that a number of incremental improvements to the current framework can and should be made to mitigate the worst of these problems. These include: a greater role for farming and rural community organisations in the OSH policy-making process; an expanded role for trade unions (via roving health and safety representatives), for regional OSH advisers, and for other partnership models; and compliance assistance and effective enforcement of legislation, with a particular focus on self-audit tools, incentive programmes to target major hazards and focused enforcement programmes with escalating penalties.<sup>9</sup>

In this paper, taking a broader international perspective (but still drawing from the Australian experience), we argue that conventional thinking ‘inside the box’ and reliance on incremental reforms to the regulatory and policy status quo (or on voluntarism, which is the response in many developed countries), will be insufficient to achieve the degree of change that is required. On the contrary, we will argue that many of the greatest opportunities for improvement in agricultural OSH and farm chemical safety currently lie entirely *outside* the boundaries of the traditional regulatory system. They relate to the profound changes occurring in global food production and trade, in the development of new agricultural and pest control technology and in (particularly rural) civil society. The problem must be approached from a variety of different angles, taking account of community, public health and environmental (rather than merely workplace) perspectives. It is also essential to take account of powerful market drivers such as supply chain pressures, as well as technological developments and the ongoing restructuring of agriculture and rural society. From a normative perspective, we consider how these forces might be shaped by government policy and civil society – what might be termed ‘regulating by stealth’ – and we identify points of policy leverage.

The effects of these forces in agriculture arise from a range of intersecting tensions and contradictions between the interests of different stakeholders – farmers, agricultural workers, large and mainly multinational food retailers and processors, rural communities, consumers and regulatory authorities. In broad terms they reflect conflicting economic forces, production pressures, cultural attitudes and priorities, as for example, in the tensions arising from:

- economic pressures on farmers to produce high-quality crops for market at the lowest possible price, multinational food retailers’ use of market power to pass responsibility for guaranteeing food safety up the supply chain, and community/consumer demands for agricultural production methods that produce safe food with minimal environmental impact
- the multinational ‘crop protection’ industry’s promotion of biotechnology-based pest control methods including genetically modified organisms (GMOs), and public scepticism about the safety of GM food products

- agricultural industry pressures for self regulation and pressures from NGOs and unions for stronger environmental and OSH regulation
- maintaining rural communities based on traditional family-based farming and adoption of the large scale, industrialised farming methods suited to providing customised commodities for global markets.

In the following sections we explore potential reforms that might be achieved by harnessing technological developments (push factors), market forces (pull factors), and changing community attitudes to risk and safety against the backdrop of these conflicts and tensions and their implications for agricultural OSH and farm chemical safety. Strikingly, in many of the struggles currently taking place between different social forces, OSH is only a sideshow. That is, the contest involves stakes that the protagonists regard as far higher than OSH, which does not figure prominently, if at all, in the calculations of many key decision-makers. Nevertheless, we will argue that, for those concerned with improving agricultural OSH, there are windows of opportunity to engage in these struggles and to shape them in ways that could have far more profound OSH implications than almost anything likely to be achieved by conventional regulatory reform at a domestic level.

It should be made clear that the material in the substantive sections of the paper will, in turn, be considering the nature of the relevant problems and then the possible policy responses that could be utilised to address them.

### Impact of technology

Advances in agricultural technology over the past two decades have major implications for agricultural OSH and farm chemical safety. The new technologies have the potential to:

- reduce the overall amount and frequency of pesticide use
- provide substitute products and methods less hazardous to health and environment
- introduce application methods that significantly reduce the risk of exposure.

Unfortunately, realisation of this potential is neither straightforward nor guaranteed given the many barriers to farmers' uptake of the new products and processes.<sup>10</sup>

Given that many farming enterprises are economically marginal, financial barriers are perhaps most significant. Since marketing arrangements often preclude any increase of commodity prices, farmers can only maximise returns on their crops by containing production costs. And since pest control accounts for a large proportion of production costs, the relative costs of alternatives can become a major factor in farmers' choice of products. Unfortunately, in many cases established products and methods, although hazardous, may be demonstrably cost-effective in the short term (ie cheaper with rapid knockdown), while the benefits of new products (including their greater safety) may only become apparent in the long term or after major changes in farming practice.

Although the major agrichemical companies are largely rationalising their product ranges in favour of new chemical and biological products, the more hazardous older products often remain on the market – with a price advantage. The product rights divested by major companies may be sold to smaller companies, which market them as cheaper generics when patents lapse, or lower-volume 'niche' products for specific and limited use. For example, Amvac Chemical Corporation, which sells a range of more hazardous pesticides divested by multinational firms,<sup>11</sup> was instrumental in providing new research data to facilitate the

repositioning of an organophosphate insecticide (Mevinphos) as a cheap niche product in the Australian market.<sup>12</sup>

Lack of credible information about the financial, health and environmental implications of new products can also be a major barrier to uptake.<sup>13</sup> If the relative benefits of new products are not well known, there is little incentive to substitute them for existing practices, particularly given farmers' culture of resistance to change and suspicion of new, untried methods. Lack of information can be exacerbated by structural and sociocultural factors. For example, work with non-English-speaking Australian vegetable growers in various regions indicated that their safety was compromised by their inability to read and understand the relatively complex English safety instructions on pesticide labels (for example, concentrations, re-entry periods) and to calibrate and compare locally available products with those familiar from their previous overseas experience.<sup>14</sup> Acceptance of change is also more likely where there are strong peer-based information networks and grower associations able to represent, negotiate and organise for the farmers collectively.

#### Policy implications

Realising the potential of next generation pest control technologies to reduce pesticide exposure in agricultural workplaces depends on substantially increasing their uptake through establishment of strong regulatory and market incentives for substitution, and removal of financial and institutional barriers to such substitution. Such increases can be driven by a mix of forces, including regulatory reform, but success is likely to vary substantially with the type of new technology involved.

Facilitating substitution of the newer and less hazardous pest control products ('softer' chemicals and biological controls), for traditionally used, more hazardous and often cheaper products may require a streamlining of institutional arrangements to remove bureaucratic and administrative barriers. For example, the current Australian regulatory framework does little to encourage substitution of safer products as they become available. The lengthy and complex bureaucratic process allows the continued marketing of a range of products, with older and more hazardous ones often holding a price advantage.<sup>15</sup> Greater regulatory incentives may be provided by alternative models that give regulators a more proactive role and provide both regulatory and market incentives for registration of safer products. In the USA, for example, the Food Quality Protection Act 1996 (FQPA) gives high priority to registering pesticides that are safer than those already on the market by fast-tracking them and giving them a significant commercial advantage in the marketplace.<sup>16</sup> Similarly, more stringent testing of the many older pesticides still in common use, as under the EU's Registration, Evaluation, and Authorisation of Chemicals (REACH) programme, is likely to discourage their continued marketing, providing incentives for greater substitution. This is necessary because, in the words of EU Environment Commissioner Margot Wallström, 'it is much less hassle to continue to market an existing chemical (that we really do not know anything about) than to put a new, less hazardous and more efficient chemical on the market because this requires testing'.<sup>17</sup>

In the case of genetic modification (GM) technologies, it is far less clear what a proactive policy might involve. GM technologies raise considerable unresolved concerns, with both the science and its implications being hotly contested and with a number of competing interests at play. In the continuing contest, OSH is not seen as a major concern and OSH policy-makers are unlikely to play any significant role in the decision-making process.

In contrast, it is clear that advances in application and spray technology can bring considerable gains to OSH with apparently few attendant disadvantages. In Australia, there has been significant uptake of this new technology, mainly by aerial spray contractors, who use it to further justify their argument for industry self-regulation. Overall, this new technology allows a significant reduction in the risk of spray drift, environmental contamination and user exposure, dependent as with all plant on appropriate levels of maintenance and calibration. From a public policy perspective there are arguments for nurturing coregulation by working in partnership with the relevant industry associations, and ensuring that small farmers are also able take advantage of the technology. We return to the strengths and weaknesses of coregulation below, noting that successful coregulation is most likely to be achieved when there is substantial coincidence between the public interest in better OSH and private interest in economic improvement.

### Agribusiness, consumer demand and supply chain pressure

The last several decades have seen widespread change in the economic and social context of agriculture and in rural communities.<sup>18</sup> Not least, the traditionally independent farmer has become heavily dependent upon the market-driven supply chains of the global agrifood industries (for example multinational supermarket chains) that now have major influence on all aspects of agriculture, including pest control. Much of this influence has been achieved through the growth of contract farming,<sup>19</sup> particularly in horticultural industries. By contracting with farmers for a specified annual tonnage of produce of an agreed and consistent standard at a set price, food processors, supermarkets and fast food chains can effectively utilise their corporate market power to impose quality requirements on growers while minimising their direct exposure to the uncertainties and risks associated with farming.<sup>20</sup>

Crucially, retailers' quality requirements now take account of consumer demands that their food be guaranteed free from contaminants and chemical residues.<sup>21</sup> This concern with safety has been heightened by globally publicised food scares (such as BSE, foot-and-mouth disease and the Belgian dioxin scandal) that have eroded consumer confidence in food safety and the capacity of government and industry to maintain adequate standards. Similarly, as the environmental impact of pesticides becomes more evident, consumer concern about the broader environmental and social impacts of food production methods is also increasing. In response to this erosion of trust, and attempting to capture a greater market share, many of the major multinational food retail chains have adopted quality and safety standards that substantially exceed regulatory requirements for residue testing. They may, for example, impose process-based requirements on growers, such as a commitment to implement the principles of integrated pest management, and the adoption of HACCP-based quality assurance (QA) measures that guarantee safe food production at all stages along the supply chain.

These developments have potentially far-reaching implications for agricultural OSH generally, as well as more specifically for levels of workplace exposure to pesticides. First, the multinational food retail chains, by imposing standards above those required by regulation, are strongly influencing farmers' pest control practices. Farmers have little choice but to accede to these standards, and so are constrained as to the quantities and types of pesticides used, the pesticide residues that are deemed acceptable in harvested crops and (to a lesser extent) the mechanisms used to reduce environmental contamination. Self-evidently, the consequent overall reductions in the amount and frequency of pesticide use can also significantly reduce the potential for workforce exposure. Second, adoption of HACCP-based QA programmes greatly improves the potential for monitoring farmers' OSH practice, including workforce pesticide exposure, by making compliance more transparent at all points.

However, market forces and supply chain pressure are unlikely to be enough in themselves to ensure the occupational health and safety of agricultural workers and others. For although farmers must either meet the food safety and environmental requirements demanded by their supply chain partners or seek out alternative markets, those standards are not directed explicitly to OSH and in some respects are ill-suited to achieve improved OSH outcomes. In the case of pest control, the cheapest option to achieve the required pesticide maximum residue levels (MRLs) may not adequately safeguard farm workers' health. For example, farmers can apply organophosphate insecticides in ways that are hazardous to the spray operators and still meet the regulated MRLs if they observe the recommended delay in harvesting (the withholding period). Similarly, meeting environmental safeguards (for example, limiting spray drift) does not necessarily guarantee close-range operator safety.<sup>22</sup>

#### Policy implications

While the regulatory framework can provide substantial disincentives for the continuing use of more hazardous pesticides, there are also other approaches that can be equally, and perhaps more, effective. Of these, supply chain pressure is demonstrably the most powerful. As we have shown, consumer concern about food safety and the environmental impact of food production has profoundly influenced the practices of the major food retailers and processors, and they in turn have required the farmers who supply them to improve their food safety and environmental practices.

Farmers will of necessity comply with the directives of their food retailer and processor clients. However, they may nevertheless use hazardous pesticides in ways that, while minimising crop residues, do not necessarily reduce the exposure level to those applying it. Their motives for doing so – cutting production costs and preventing crop failure – usually trump interest in their own and workers' health. Accordingly, although supply chain pressure can reduce workforce exposure to pesticides, it is not enough to ensure safe workplace practice. In essence, because OSH considerations and food safety considerations are not always closely aligned, and retailers only experience major consumer pressure to address the latter, the impact of supply chain pressure on OSH is indirect and incomplete.

However, this could substantially change if alliances of workers' organisations, consumer groups and international NGOs were to bring pressure on retailers to expand their concerns to include OSH. The vehicle through which this might be achieved is the broader movement for corporate social responsibility (CSR), which encapsulates the notion that companies have obligations that extend beyond shareholders, and that these include corporate social, economic and environmental responsibility.<sup>23</sup> This movement is of recent origin and is still evolving, but has already had a very considerable impact on large reputation-sensitive corporations, as the recent literature clearly demonstrates.<sup>24</sup>

While such matters as human rights, the use of child labour in developing countries and other exploitative practices are already on the CSR agenda of international NGOs, OSH has remained largely on the sidelines. However, there is no reason why this should continue to be the case. The NGOs already involved are sympathetic to OSH, but it is unlikely to be a priority unless other groups make it so. Hence the potentially crucial role of trade unions and others with direct interest in OSH is to develop alliances with CSR-oriented NGOs to bring it closer to centre stage. If this were done, and OSH reporting became a routine part of the broader exercise of CSR reporting and accountability, it would be a small step for retailers to demand that growers adopt pest control practices that better ensure workplace safety.

Indeed, such an approach, in embryonic form, may be emerging under the Euro-Retailer Produce Working Group, Protocol on Good Agricultural Practice (EUREPGAP) initiative. While EUREPGAP is largely a response to community pressure for improved food safety and environmental protection, nevertheless some major retailers are already extending their concern to OSH. Thus, the EUREPGAP Terms of Reference require the commitment of participating member organisations to ‘respond to consumer concerns on food safety, animal welfare, environmental protection and worker welfare’, and the 2001 Protocol for fresh fruit and vegetables directly addresses agricultural OSH within a ‘framework for good agricultural practice (GAP)’. This requires adoption of integrated pest and crop management (IPM and ICM) and includes both mandatory and recommended (‘encouraged’) provisions for comprehensive assessment and management of food safety, environmental and OSH risk along the whole supply chain.<sup>25</sup>

However, this approach will not engage with the predominantly smaller agricultural producers who have sought to avoid the global supply chain altogether by seeking out alternative markets. For this group, government can play an important role, beyond that of conventional regulation, by providing greater incentives to use safer products. In the case of organic farming, there is, by definition, an absence of synthetic pesticide use and a consequent dramatic reduction in, or even eradication of, the associated risks. For this reason, the expansion of organic farming is clearly in the interests of improved OSH. But the proportion of organic farmers is still small, and there is little government support.<sup>26</sup> A 1995 Australian study concluded that greater government support for farmers (both short term subsidies and advice and technical support) could well increase the rate of change towards organic farming and further accelerate what is already a fast-growing sector.<sup>27</sup> Similarly, the adoption of IPM or other ‘low spray’ approaches could be increased by greater government support for its adoption in all industry sectors.

#### Pressure and partnership – the roles of civil society

Civil society, in the form of rural community organisations, farmers’ and growers’ associations, unions and industry bodies and NGOs, has considerable potential to change pest control practice at farm level and to influence government and industry policy on the use of pesticides. The changes required to improve agricultural OSH can also gain leverage from those needed to ensure food and environmental safety.

More broadly, the various manifestations of civil society act in a variety of ways to influence corporations, consumers and markets, often bypassing the state altogether (what can be termed ‘civic regulation’). Sometimes NGOs take direct action, usually targeted at large reputation-sensitive companies. In others they seek to develop partnerships with such companies.<sup>28</sup>

However, as we will see, the evolution of civil regulation has not taken place entirely divorced from state intervention. On the contrary, partly in recognition of their own limitations, governments have taken a number of measures that have served to further empower communities, environmental NGOs and the public more generally.<sup>29</sup>

#### Rural community organisations

One key role for civil society involves information and education. Information must not only be disseminated, but it must also be received, and there is considerable evidence that the source of that information is all important,<sup>30</sup> with information from trusted sources having by far the greatest impact.<sup>31</sup> In this context, rural communities have a potentially crucial role, since they usually have far higher credibility with farmers than either government or third parties. In

Australia, some rural community organisations are already playing this role in relation to pesticides – largely focusing on changing practices at farm level through collaborative programmes building on existing rural networks to promote better OSH outcomes. Some programmes focus on discrete issues of farm chemical safety (for example spray drift), while others tackle larger systemic issues (for example child safety), but a common theme is the identification of farm safety as a shared issue for farmers/agricultural workers and rural communities.

However, rural organisations have very limited resources and function far more effectively when a partnership is developed with government. For example, governments can become wholesalers of information (which they are in a far better position than rural groups to obtain) while using community groups as information retailers/disseminators. Thus government continues to fulfil its traditional information and education function, but does so in a way that has greater credibility and impact on the target group, which also gains ownership of the process. For example, in the Australian state of Victoria the close working relationship between the farmers' organisations and the OSH authority was a major factor in the success of the ROPS (roll-over protection structures) initiative,<sup>32</sup> which has significantly increased farmers' awareness and compliance with regulatory OSH measures to achieve greater tractor safety.

However, while this grassroots focus may be critical to intervention at farm level, it is not sufficient to achieve the systemic change required to achieve better OSH outcomes at industry level. In the terminology of OSH, it may produce a number of (but not enough) 'safe persons' but is not sufficient to produce the industry wide 'safe place' or 'safe system' approach needed to substantially improve OSH outcomes. Achieving this outcome requires moving beyond the traditional tripartite approach to ensure direct policy input from rural community-based organisations, which often have the greatest insights into practical problems and the trust of farmers and farm workers. Their more direct participation in the policy process would bring the necessary understanding of rural issues to the policy and regulatory processes and enable them to more effectively influence government policy and practice in the area of pesticide safety. Most importantly it would also enable OSH issues to achieve greater prominence through association with other safety issues with already greater acceptance and higher importance in rural areas, such as the growing concern about child safety on farms.

Industry organisations and unions

OSH legislation and the ongoing industrial negotiation of work conditions provide both employers' associations and unions with significant roles in the development of OSH regulations and policy at state, industry and workplace level. They already have significant influence on policy development through representation on major national and international advisory and consultation bodies that make recommendations and decisions about important technical issues (for example methods of risk assessment, acceptable MRLs). They can also have considerable direct political influence, depending on which political party is in power. Beyond this, both industry associations and trade unions have important, but quite distinct potential roles.

In Australia, industry associations, in at least some sectors (but far from all), have taken significant initiatives to improve the safety, health and environmental practices of their member organisations. For example, some conduct comprehensive training and accreditation programmes that demonstrate considerable industry capacity to self regulate and to achieve better stewardship of pesticides. In some commodity sectors (for example cotton growing) they

have played a major role in developing comprehensive strategies to reduce and better manage pesticide use and been pivotal in achieving grower support for the changes. They can also access and organise the necessary research and development and advisory services and negotiate the economic incentives that facilitate adoption of new pest control practices. Organisational motivation to intervene includes the perceived need to demonstrate industry capacity to safeguard community and environmental safety in order to avoid the alternative of stronger government regulation, as well as concern to optimise market opportunities.<sup>33</sup>

Trade unions too can play a variety of important roles. While membership of unions in rural industry is small, recent work in Western Europe suggests that worker representation can still make a valuable contribution to OSH on farms – but only with some lateral thinking and a different approach to that taken in large industrial workplaces such as factories and construction sites.

In a number of jurisdictions, most notably in Sweden and Norway, there is statutory provision for the appointment of regional health and safety representatives, including in agriculture. At least within the Scandinavian cultural context, these have been largely successful.<sup>34</sup> However, the evidence suggests that in cultures with a history of conflict between employers and employees, such unilateral approaches (even if underpinned by legislation) will be less successful than those that have the support of all the stakeholders. Drawing from the European experience, Walters has attempted to identify the factors that influence the success of worker representation approaches in the agricultural context. He points to the industrial relations culture, the degree of union density and the attitude of owners/managers to both health and safety and worker participation as critical factors. Regional safety representatives also face major challenges in terms of legitimacy and credibility, not only with farmers and small business owners, but also with workers themselves. These challenges may well make conflict-based approaches (such as serving improvement and prohibition notices) counterproductive, and suggest the importance of using the rural media to generate wider community support. Lack of resources is another major obstacle. Representatives can function effectively only if they have adequate training and some organisational support. Walters points out that ‘very few schemes have been developed without the injection of resources from one source or another’.<sup>35</sup> Beyond all else, the widespread support of employer organisations, government authorities and other stakeholders in the small business sector seems central to success.

Now is not the place for a detailed examination of the role of industry organisations but, in policy terms, it should be noted that they can play an important role in improving pesticide-related OSH. In essence, the more agricultural enterprises do for themselves, the more successful they are likely to be in committing to and achieving outcomes. In any event, in circumstances where government inspectors have extremely limited capacity to reach and influence small enterprises directly through inspection and enforcement, few other options are currently available.<sup>36</sup> However, many self-regulatory initiatives are little more than a sham – a spurious means of keeping government regulation at bay – and much depends on how they are designed.<sup>37</sup> We draw a crucial distinction between pure self-regulation and coregulation. The former involves giving industry very considerable autonomy in relation to both goal-setting and implementation, and has (with limited exceptions) an unhappy track record.<sup>38</sup> The latter refers to a hybrid policy instrument involving a combination of government-set targets and industry-based implementation, with even this latter element being underpinned by government controls.<sup>38</sup>

Coregulation may have a considerable role to play in some contexts and circumstances. The crucial question is which ones. Canadian research suggests the following criteria for identifying a sector's readiness for coregulation or self-management:<sup>39</sup> a successful track record of professional industry development programmes, such as a code of ethics; a documented history of consultation and partnership with government and others to solve marketplace problems; a demonstrated capacity to perform some legislated functions on behalf of government; the existence of a representative national or provincial industry group or association; and the proven ability to represent a balance of interests. Even when these criteria are largely satisfied, industry coregulation is clearly no panacea, and must be used selectively and with caution. Nevertheless, one is usually comparing grossly imperfect regulatory options and before dismissing the potential role of coregulation as flawed one has to ask: compared to what? As one of us has argued elsewhere, there may be some contexts in which it may represent the most viable regulatory option for dealing with small enterprises, particularly where government resources are very limited.<sup>24</sup>

### NGOs

Public campaigns by NGOs concerned with consumer rights and the environment have given high visibility to the issues of pesticide residues in food, pesticide contamination of water and soil and its impact on human health. Largely as a result of such campaigns, public concern about pesticide use is mainly focused on its health and environmental implications. The OSH impact of pesticide use is, by contrast, a comparatively invisible issue and largely tangential to the primary focus of public campaigns. Few organisations other than trade unions and farmers' organisations consistently raise the OSH aspects of pesticide safety in the public arena – and then it is generally presented and perceived as a sectoral industry issue rather than one of concern to the whole community.

Yet there is considerable potential to harness the energies of NGOs in the interests of improved pesticide safety.<sup>40</sup> One means of doing so – through alliances committed to more effectively incorporating OSH under the broader rubric of CSR – has already been canvassed. Another, less confrontational, approach is the development of partnerships between NGOs and industry, and even government, under arrangements from which all parties benefit. This approach is exemplified by 'green alliances', which involve collaboration between an agricultural sector or individual enterprise, and one or more environmental organisations. Most commonly, business seeks to obtain the political goodwill and credibility which NGOs bring to the partnership – benefits which may bring greater market advantages. In exchange, environmental groups expect a commitment to improved environmental (and sometimes OSH) practices on the part of their industry partner. For example, an environmental organisation might bestow an environmental logo to appear on approved agricultural produce, or participate in joint marketing programmes, in exchange for specified and measurable environmental improvements. Since consumers express a preference for 'green' produce (although they are not always willing to pay a price premium for it), such endorsement, provided it is recognised in the marketplace, may be a particularly valuable asset with the potential to increase sales or access new markets.

Many such alliances have only marginal implications for workplace pesticide safety, but others have the potential to achieve far greater improvements than most conventional policy instruments. For present purposes, we provide two such examples. First, we refer to the role of partnerships in increasing the uptake of IPM, which is likely to involve a much reduced risk of pesticide exposure. Lori Ann Thrupp has demonstrated, through a series of case studies in both developed and developing countries, the effectiveness of partnerships between farming

groups and NGOs (and often scientists and government or inter-government institutions) in replacing chemical-intensive farming methods with alternative agro-ecological approaches.<sup>41</sup> All the partnerships that were studied significantly reduced agrochemical inputs, costs and health risks; controlled pests and diseases at acceptable levels; maintained or increased yields, contributing to productivity and food security; increased the 'health' of the farming system (for example soil quality and resilience); and spread the benefits widely and/or empowered communities.<sup>34</sup>

A second example involves the Wisconsin Potato and Vegetable Growers Association (WPVGA), which for many years had been concerned to reduce the use of broad-spectrum, high risk pesticides.<sup>42</sup> There were a variety of reasons for this. Economically, the Wisconsin potato industry had been under considerable economic threat, exacerbated by increases in pest management costs, and by 1996 growers did not recover production costs. There were also compelling health reasons as high levels of pesticide spraying were associated with serious health problems for local residents, farmers and their families. Finally, reducing pesticide use would improve the quality of the region's shallow ground water and enhance the quality of wildlife habitat and diversity of species sharing the agricultural landscape.<sup>43</sup> Shifting to IPM had also offered the capacity to 'expand profit margins by avoiding unnecessary pesticide applications and reducing pest pressure through a variety of means, some of which entail little or no cost'.<sup>32</sup>

WPVGA did not need a partner to develop IPM but it did need some means of marketing the environmental advantages of low-residue Wisconsin potatoes, and help in developing a premium market for environmentally friendly potatoes. Enter the World Wildlife Fund (WWF), an international and high profile environmental NGO whose panda logo and reputation could potentially provide considerable public relations, marketing and credibility advantages to WPVGA. In particular, the potato growers hoped the partnership with WWF would:

- document progress in the adoption of bio-intensive IPM and reduction in reliance on high-risk pesticides
- quantify public health and environmental gains achieved as a result of industry-wide commitment to IPM
- gain recognition for Wisconsin potato products, especially in quality-conscious markets
- support the policy reform and public and private investments needed to enhance the effectiveness and lower the cost of bio-intensive IPM.<sup>44</sup>

For WWF, the partnership also held considerable attractions. For some time, WWF had been concerned to lessen reliance on pesticides and had identified IPM as the surest way to achieve this objective. Through the project WWF hoped to demonstrate:

- the value of setting measurable pesticide use, risk, and IPM adoption goals, and ways to do so
- how monitoring and rewarding progress towards concrete goals can build the momentum needed to overcome technical and marketplace hurdles
- a co-operative model for partnerships involving environmental and commodity groups committed to common goals
- analytical tools and policy innovations to help achieve national IPM, food safety and environmental quality goals.<sup>33</sup>

While the success of this partnership is by no means clear, it does illustrate how groups that have traditionally adopted adversarial positions have much to gain through co-operation, and how this could have considerable spin-off benefits for OSH in some contexts. Notwithstanding difficulties that emerged in the partnership arrangement, the early results from the project demonstrated a quite striking level of success:

Wisconsin reduced use of high-risk insecticides by over 60 per cent in a year when national insecticide toxicity units per acre went up 6 per cent. Toxicity units associated with all herbicides, insecticides and fungicides applied in Wisconsin fell 20 per cent between 1995 and 1997, but rose 16 per cent nationwide.

There was also evidence that farmers who use fewer pesticides significantly increase their profit margins.<sup>45</sup>

Finally, within Australia, one may refer to the partnership developed between the Victorian Vegetable Growers Association (VVGGA) and the Victorian Environment Protection Authority (EPA). This partnership in essence involves a commitment by the industry association to develop and implement an environment improvement plan (EIP) with an emphasis on cleaner production and initially involving: a pollution audit; an awareness programme and management audit; environmental management guidelines; and a training programme. In return the industry gains credibility and EPA endorsement of its environmental credentials. The partnership was precipitated by the industry's fear that if it were to proceed with environmental improvements in the absence of substantial EPA engagement, others, including the supermarkets and the wider community, might not believe its claims to be achieving higher environmental standards. From the EPA's perspective, the attraction is that vegetable growers may be persuaded to improve their environmental performance to a level far greater than could be achieved through traditional regulatory approaches alone.

However, the success of the partnership in its present form is not guaranteed. It has been argued elsewhere that if it is to prosper rather than merely survive, further measures will be necessary. Not least, the EPA must be prepared to contribute to it not just financially but also in substance. Efforts must be made to harness the supply chain pressure that the supermarkets can provide and the community must be empowered to become an active participant in the process of achieving cleaner production. It is only by harnessing these pressures, by nurturing cleaner production initiatives through an industry partnership and by providing an underpinning of regulation for growers who do not respond, that regulators can achieve a long-term improvement in industry standards. The best chances of a successful partnership in this sector involve multiple party, multiple instrument arrangements.<sup>24</sup>

Governments can also empower NGOs directly. Perhaps the most powerful means of doing so is by what is becoming known as 'informational regulation' which has been defined as 'regulation which provides to affected stakeholders information on the operations of regulated entities, usually with the expectation that such stakeholders will then exert pressure on those entities to comply with regulations in a manner which serves the interests of stakeholders'.<sup>47</sup> Informational regulation involves the state encouraging (as in corporate environmental reporting) or requiring (as with community right to know) the provision of information about environmental impacts but without directly requiring a change in those practices. Rather, this approach relies upon economic markets and public opinion as the mechanisms to bring about improved corporate environmental performance. As such, informational regulation 'reinforces and augments direct regulatory monitoring and enforcement through third-party monitoring and incentives'.<sup>36</sup>

Like most strategies, informational regulation also has limitations, insofar as its impact is substantially confined to large enterprises, and in particular to public companies (which are vulnerable to share price fluctuations and investor perceptions) and those which are reputation sensitive. Nevertheless, for these types of enterprise (which are most capable of being rewarded or punished by consumers, investors, communities, financial institutions and insurers on the basis of their environmental performance) it is highly effective. The overall strategy is to empower these groups to use their community and/or market power in the environmental interest by providing them with sufficient information to evaluate a company's environmental performance. As companies recognise the importance of protecting their 'social licence' and the need to improve their environmental performance in order to do so,<sup>48</sup> they become particularly sensitive to reputational issues. For example, in the case of pesticides, a government regulation might require supermarkets to list the level of pesticide residues in their fresh produce – along with those of their rivals – thereby creating a 'league table'. Alternatively, they might require disclosure of the chemicals used by suppliers in the course of developing a particular product.

## Conclusions

Exposure to pesticides poses a serious, albeit in some respects incalculable, threat to farmers, agricultural workers and others. Incremental reforms to the regulatory status quo would no doubt mitigate the problem to some extent.<sup>49</sup> However, it may well be, as this paper has argued, that greater opportunities for improving agricultural OSH and farm chemical safety lie outside the boundaries of the traditional regulatory system and depend on harnessing the potential of new agricultural and pest control technology; the market forces driving global food production; and powerful forces within civil society to change community attitudes to risk and safety – what might be termed 'regulating by stealth'. The ways in which these forces play out in agriculture largely reflect the tensions arising from the often conflicting economic interests, production pressures and cultural priorities of industry stakeholders – farmers, agricultural workers, rural communities, multinational food retail chains, consumers and regulatory authorities.

New pest control technology and crop management methods have the potential to substantially reduce the current extent and frequency of hazardous pesticide exposure in the workplace. However, realisation of this potential is neither straightforward nor guaranteed. Lack of market availability, cost factors and knowledge and cultural barriers may combine to limit farmers' uptake of next-generation pest control products. And in some jurisdictions, including Australia, the current regulatory framework does little to provide an effective market advantage for safer products or to encourage farmers to substitute them for often cheaper, more hazardous pest control methods. While streamlining of current institutional arrangements may remove some bureaucratic and administrative barriers, it is unlikely to substantially increase the availability and uptake of safer pest control products without provision of stronger market and regulatory incentives for change. The adoption of an alternative regulatory model that proactively facilitates the registration and marketing of lower-risk products would go a long way to encouraging their marketing and use.

Market forces, acting through the global supply chains of the major food retailers, can also be powerful drivers of improved pest control practices by farmers. In response to consumers' demands for guaranteed food safety, food retailers are using their market power to insist that their suppliers adopt pest control measures that minimise pesticide residues and environmental impacts. These changes have considerable potential to reduce workforce pesticide exposure. However, they are not enough in themselves to ensure safe OSH practices since minimising

crop pesticide residues does not necessarily reduce the exposure level of those applying the pesticide. Farmers frequently give priority to cutting production costs and preventing crop failure over their own and workers' health, and may continue to use hazardous pesticides in hazardous ways provided they can satisfy minimum residue requirements. However, it would not be a large step for major food retailers and other agrifood corporations to insist upon improved OSH practices, for example as part of the overall QA requirements they impose on their suppliers. But they are unlikely to do so in the absence of external pressure. Such pressure is most likely to come from the Corporate Social Responsibility movement that has been developing rapidly over the last few years. CSR implies that companies should operate in a way that consistently exceeds legal, commercial, ethical and public expectations – that is adopting the 'triple bottom line' approach. To date OSH has remained largely on the sidelines but there is no reason for this to continue if trade unions and CSR oriented NGOs further pressure corporations to adopt OSH as a routine part of CSR.

For smaller agricultural producers who do not participate in the global supply chains, government can have a similar influence on pest control practices through greater support for the expansion of IPM and organic farming. It can also regulate to give farmers greater marketing control, including the power to bargain collectively, thereby enabling them to obtain better returns on their produce and protection against the abuse of market power. Such a move would remove some of the intense market pressures that often result in farmers risking their own and their employees' health and safety to ensure short-term financial benefits.

Finally, various institutions of civil society have the capacity to play critical roles in changing agvet chemical policy and practice. Rural community organisations, farmers' and growers' associations, unions and industry bodies and NGOs can variously influence pest control practices at farm level and government and industry policy. For example, some NGOs take direct action, usually targeted at large reputation-sensitive companies, seeking to embarrass or otherwise pressurise them into improved environmental performance, often with spill-over OSH benefits. In others they seek to develop partnerships with such companies as a more constructive means to achieve similar results. Rural communities and organisations, play an important role in disseminating information, since rural community organisations usually have far higher credibility with farmers than either government or third parties. They can also provide an important policy input provided they are given the opportunity to do so. Industry associations, too, have taken significant initiatives to improve the safety, health and environmental practices of their member organisations and, through coregulatory initiatives, may have the capacity to achieve better stewardship of agvet chemicals, at least in some contexts. Trade unions too, notwithstanding limited rural membership, can achieve a great deal through initiatives such as roving or regional safety representatives, and innovative joint programmes in partnership with rural organisations.

There are two final points. First, many of the evolving roles of civil regulation have not taken place entirely divorced from state intervention. On the contrary, governments have taken a number of measures that have served to further empower communities, environmental NGOs and the public more generally, and, notwithstanding the retreat of the regulatory state, should continue to do so in the future. Second, recognising that all instruments have both strengths and weaknesses and that none is likely to be wholly successful in achieving its OSH goals, what is needed is an integrated strategy incorporating a variety of different but complementary instruments. A sequenced approach, gradually escalating from more co-operative to more interventionist instruments, may not only make the best use of scarce regulatory resources, but also better motivate target groups.

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facilitate the co-ordinated issue of off-label permits for smaller industry sectors. For example, Crop Protection Approvals was established in 1999 to secure off-label permits and registrations for pesticide use in the horticultural industries. These initiatives may usefully simplify the process for (particularly) small and medium-sized enterprises (SMEs), but it is unlikely that streamlining alone will substantially increase ease of registration or farmers' uptake rate, without provision of stronger market and regulatory incentives.

16. For further information on FQPA, see [www.epa.gov/opppsps1/fqpa/](http://www.epa.gov/opppsps1/fqpa/).
17. Press release and speeches at [europa.eu.int/comm/enterprise/chemicals/chempol/whitepaper/reach.htm](http://europa.eu.int/comm/enterprise/chemicals/chempol/whitepaper/reach.htm).
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22. For example, over the last decade Australian growers of processing tomatoes have significantly changed their pest control methods with widespread adoption of IPM and an overall reduction in the frequency and volume of pesticides sprayed. However, the growers, working on low financial returns, still choose to use the newer, safer and more expensive 'softer' pest control products only when there is no cheaper, albeit more hazardous, alternative product. Source: personal communication, Shepparton 2002.
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