

Tena koutou, and good afternoon to the panel and EPA staff and others listening in to this call.

First, thank you to the EPA for the opportunity to submit my two cents' worth to this process in writing last September, and to speak to you on the phone today.

I'm not a scientist though I have qualifications in the social sciences. I'm not a farmer, not a horticulturalist, not a nurseryman (nurseryperson? What is the gender-neutral term? It escapes me), not a beekeeper. I can't even claim to be a gardener because Paul, my husband, is the real gardener of the family. I'm not of Maori or even New Zealand descent though I'm proud to be a New Zealander.

Actually, I have to admit to a well of ignorance. I don't know how many different pesticides are registered for use in New Zealand, how much money is spent on pesticides here, and by whom – what proportion are bought for use on farm crops, in horticulture, by nurseries for treating seeds and protecting their plants, by municipalities and schools and other public bodies and also by the general public for use in their home gardens; I don't know how many repeat applications are applied in any particular place, and what the synergistic and/or cumulative effects of all this pesticide use might be, on the soils and their complement of billions of organisms, on the pollinators and other creatures directly or through the food chain, on adult humans, on children, on children yet unborn. With respect, do you? Does the EPA? Does anyone? What studies have been done?

So, why am I giving evidence? What *locus standi* do I have? In other words, who am I to talk?

I am a consumer of food – as we all are – and interested in the quality of the food I feed to my family, and in the quality of food that is available to the public in general.

Although I watch Master Chef, I'm not obsessed with food as art and don't just care what food looks and tastes like (although that can be important, not only for our appetite, enjoyment and digestion but also in persuading children to eat). **I care about the nutritional value of the foods we eat, how each foodstuff is produced, and what this means for our physical, mental and even spiritual health AND the health and sustainability of the ecosystems that sustain us all.**

That's why I wouldn't buy eggs that aren't free range, and why I don't often buy pork in New Zealand because it's hard to find pork that has not come from cruelly caged pigs. We are lucky enough to be able to buy, in Raglan where we live, organic butter and cheese, vegetables, fruits, nuts, seeds and so on from Whaingaroa Organic Kai. We buy organic milk from SuperValue. In our garden, Paul grows food with our own organic compost and using companion planting methods, without any chemical sprays or treatments. Thanks to his labours – and those of our similarly-minded neighbour, Annette -- our little piece of Raglan is home to many birds, butterflies, bees and other pollinators which lift our spirits and make our hearts sing. Paul and I don't mind that the blackbirds eat all 'our' strawberries. It's a small price to pay for their song. Last year we

anonymously provided sponsorship for someone younger than we are to take a permaculture certificate course in Raglan. We also donate regularly to a number of environmental ‘good causes’ – including the ‘Bee Cause’ of Friends of the Earth in the UK.

I’m speaking to you, then, as a New Zealand citizen and resident, as a consumer of food and provider of meals for my family, and as someone who cares deeply about the **interconnected web of life on which our production of food and our very survival, let alone our economy, ultimately depend.**

If I’m not getting into the ‘nitty gritty’ of particular organophosphate or carbamate pesticides, why is what I’m saying relevant for this panel to consider? I’m relying on the final paragraph of the Application summary, where it says:

Other information

If there is other information you wish us to be aware of, please also include this in your submission.

I read in the online UK newspaper, the *Independent* (Sunday 15 February 2015) that scientists at the Global Challenges Foundation and the Future of Humanity Institute at Oxford University have drawn up a list of the 12 most likely ways human civilisation could end on planet Earth. The list includes not only such challenges as extreme climate change, nuclear war and global pandemic, but also ecological catastrophe.

[Note added after I gave my presentation: resources mentioned in this presentation are now cited at the end, before the appendix.]

It says in the article,

The researchers say that humanity either has to conserve the eco-system, or hope that civilisation is not dependent on it.

That is worth repeating: humanity either has to conserve the eco-system, or hope that civilisation is not dependent on it.

“Species extinction is now far faster than the historic rate,” the study warns. They say humanity must develop sustainable economies in order to survive this one.

That, too, bears repeating. What the researchers are saying is that **humanity has to develop a different kind of economic system – a sustainable one – if we ourselves are not to become extinct.** This gels with what I’ve been reading recently, including

Wilkinson and Pickett's book, *The Spirit Level*; Ha-Joon Chang's *Economics: The User's Guide*, and his *23 Things They Don't Tell You About Capitalism*; Elizabeth Kolbert's *Sixth Extinction*; and Tony Juniper's *What Has Nature Ever Done for Us?* I'm old enough to have read Rachel Carson's *Silent Spring* – and the Club of Rome's report, *Limits to Growth* – back in the 1970s. Those books are still all-too relevant today – as are Barry Commoner's books from that time, *The Poverty of Power* and *The Closing Circle*.

In a presentation published (5 Feb 2014) on YouTube by Synergetic Press,* Tony Juniper talks about the major challenges of extinctions due to habitat destruction, pollution and climate change, and how recent economic and financial crises have prompted many people to pose a false choice between protecting the environment OR promoting economic welfare – a false dichotomy Juniper describes as 'insane'. Talking about how we benefit from natural capital and especially the crucial interrelationships in nature that underlie our economy and civilisation, he says:

Perhaps the most obvious set of relationships that we know about in the sense of sustaining the human economy and civilisation is **pollination**.

[*See <https://www.youtube.com/watch?v=dYxAddIkQbQ> ; if you don't have 40 minutes and 19 seconds to spare to watch the whole video, the part about pollination starts about 18 minutes in!]

Although he also mentions hummingbirds and bats, Juniper says that most of the work of pollination is being done around the world by insects: butterflies, flies, beetles and most of all, of course, **bees**.

The value of the crops so pollinated has been estimated at **\$1 trillion (USD) a year**. The contribution of the work of **bees** alone, in transferring pollen from one plant to another, is worth **\$190 billion (USD) a year** to the human economy.

I'm sure I don't need to tell you that bees (among other pollinators) are under threat from climate change, declining habitat due mostly to monoculture, and the related impacts of the heavy use of chemicals including pesticides.

Juniper gives an example of the production of apples and pears in China being boosted by heavy pesticide use in the 1980s. The pesticides killed off the pollinators. Today, in south-west China, humans have to use feather dusters to painstakingly transfer pollen. (I'm not sure which class(es) of pesticides was or were to blame.)

This isn't just a historic problem, nor just a problem for China. According to Grace Communications Foundation's **sustainableable.org** website,

There are over **350,000** current and historic pesticide products registered in the US, and the pesticide business is a **12.5 billion** dollar industry in the US alone

-- doesn't that make you wonder about the rigour with which these 350,000 pesticides could possibly have been tested and monitored? Can we really trust data from the US EPA or should we (as in, NZ EPA) conduct our own tests?

Sustainabletable.org quotes Cornell entomologist David Pimentel:

It has been estimated that only 0.1% of applied pesticides reach the target pests, leaving the bulk of the pesticides (99.9%) to impact the environment.

The harmful environmental effects include loss of biodiversity and elimination of key species including bees; water pollution; soil contamination; and pest resistance – leading to the application of MORE pesticides, and the formulation of new ones.

One cautionary tale Juniper tells, of accidental and unforeseen effects of chemical use on natural relationships and processes -- and ultimately on a country's economy -- concerns the widespread use of dichlofenac in animal husbandry in India. This anti-inflammatory drug in the carcasses of dead cattle was eaten by vultures, which then developed organ failure and died – on a massive scale. Whereas vultures used to perform an invaluable 'ecosystem service' by eating the meat off the bones, leaving clean bones to be turned into fertiliser, if the carcasses are not disposed of by people (at great cost, and with the added 'opportunity cost' of the loss of other economic activities those people could be undertaking), the carcasses are now eaten by wild dogs. Thanks to this now-plentiful food source, which wasn't available when vultures abounded, India now has an extra 7 million wild dogs – which carry diseases and have caused an estimated 50,000 additional human deaths from rabies. The losses to the Indian economy have been estimated to total (USD) **\$34 billion**.

Apart from the vultures, Juniper gives other examples of natural controls for diseases and pests, such as the control of West Nile virus (carried by mosquitoes) by wild birds. The higher the degree of diversity of wild bird populations, the lower the incidence of West Nile virus in humans.

Songbirds in orchards eat caterpillars. In one trial Juniper mentions, the presence of great tits in an area doubled fruit production vis-à-vis areas without them. The grosbeak's similar feasting on caterpillars is said to be worth (USD) **\$1500 a year per hectare** to the timber or pulp industry.

Summing up his book and presentation towards the end of the video, Tony Juniper says:

So when you start to add it up – the carbon capture; the plant growth; the biomimicry; the medicines; the pollination; the disease control; the defences of the coastal areas; the oxygen we breathe in the atmosphere; the replenishment of fresh water; the recycling of nutrients – what's nature ever done for us?

[Appreciative laughter from the audience]

-- And yet, in many finance ministries across the world and many boardrooms that argument still prevails, that there is somehow a choice to be made between protecting the ecosystems and growing the economy, when of course it's quite obvious to anybody who thinks about it that you have no economy if you take away the ecology ...

Robert Costanza, the daddy of 'ecosystems services' research, estimates the worth of the ecosystem services nature provides to be at least **double the value of global GDP each year**. [Figure quoted in Juniper book and video.]

But 'revenons à nos moutons' ('let's get back to our sheep: let's get back to the topic), or rather, 'revenons à nos abeilles'! (Let's get back to the bees.)

The manufacturers and promoters of pesticides and other agricultural chemicals don't embrace the concept of ecosystem services. They don't think in terms of protecting **ecosystems**. Rather, what they appear to think and care about most is the protection of their own **profits**.

According to statista.com ,

In 2008, the global agrochemical market was worth 46.1 billion U.S. dollars. Agricultural chemicals often refer to a wide range of pesticides, insecticides, herbicides, and fungicides. Many of these chemicals can be toxic and can be a significant risk to both the human population and the environment.

What the agrochemical industry talks about is '**plant protection**' – as if the plants and their current economic value to the economy could be isolated from the ecosystems within which the plants are growing and the continued health and sustainability of those ecosystems, their continued ability to support the complex interrelationships in the soil, water and air that sustain all life and sustain us.

Don't you think it's time we heard more from our EPA about **alternatives to pesticides** such as IPM – integrated pest management? I refer you to sustainabletable.org – and I will append the document, Integrated Pest Management (IPM) Principles, last updated on 5 August 2014, from the US EPA's fact sheet series on pesticides

<http://www.epa.gov/pesticides/factsheets/ipm.htm>

Isn't it time we heard more about permaculture, organic farming and gardening, too, and the real protection of our environment and ecosystems? (Perhaps IPM could be one step in the right direction and not seen as a step too far.) I understand that the EPA is

operating in a difficult political environment when it appears all our government can see is dollar signs from the destruction of our terrestrial and marine environment through oil exploration and drilling and seabed mining, but is it too much to hope for more independent and proactive research?

I haven't had the benefit of listening to all the evidence at this hearing today and have only had access to the earlier written submissions on the web. I agree: with Frank Visser's concerns about translocated insecticides; with Yvonne Curtis's concerns about (presumably, not just organophosphate and carbamate but also) neonicotinoid pesticides, and her adverse comments about an approvals process that calls upon submitters to prove a substance unsafe [rather than having those who want to profit from its manufacture, sale or use demonstrate its safety – a precautionary approach]. I have reservations about para. 8 of Dr John Liddle's submission on behalf of the Nursery and Garden Industry of New Zealand, where he cautions the EPA about 'removing tools from the plant protection tool box'. (We clearly don't interpret the world through the same metaphors. Borrowing his for a moment, though, when it comes to nature and natural processes let's not put a spanner in the works!)

Te Runanga o Ngai Tahu's submission argued persuasively, through careful assessment and criticism of the available studies, for adoption of a 'more conservative, precautionary approach than that evidenced in the application'. Ngai Tahu point out that, while supposed wider benefits of the application are claimed to include benefits to 'other pollinators' and 'native bee species', no research to back this up was done or reported. I applaud urging the Authority

to take a precautionary approach (as required by the [HSNO] Act) and to err on the side of protecting the environment (and thus native biodiversity) rather than impose softer controls in order to appease industry.

I agree with the recommendation that the agribusiness industry commission research

on the effects of these and other plant protection products on those native bees and other insect species which are known commonly to visit the flowers of commercial crop species.

I note that Federated Farmers, in supporting the application,

does not want to drive farmers from using one hazardous agricultural compound to another which may be more hazardous to beneficial insects.

Federated Farmers calls for clear labelling, and shows apparently genuine concern for the welfare and survival of bee populations (and other insect pollinators). At the same time,

reference to the potential for ‘serious poisoning’ of bees does cause me to worry about the apparent (if perhaps uneasy?) ‘TINA-style’ (‘There Is No Alternative’) acceptance of the widespread use of any ‘hazardous agricultural compound’ whatsoever in the growing of food crops in supposedly clean, green New Zealand.

The EPA’s proposed label wording specifying the control periods will presumably have to appear in tiny print – at least on any products sold in small quantities on the shelves of neighbourhood hardware stores and nurseries -- even if, as I expect, there will be no explication of relevant sections of the HSNO Act. (One can’t help wondering whether pesticide packs should come with a free magnifying glass.)

I won’t summarise or repeat the excellent presentations you have heard this afternoon, which no doubt are fresh in your minds.

Tony Juniper’s video ends by discussing the need for the emergence of a **bio-economy**. He says:

Fortunately, we have all the technologies; we have the policy tools; we have the economic instruments. The thing we have to shift is the narrative...

I think that’s what some of the submissions and presentations to this panel have tried to do even at risk of being ruled ‘out of scope’.

I am a mother of three and a grandmother, with my sixth grandchild due in August. I wonder what kind of future the child born this year will face in a world where the human population is set to exceed 9 billion by the time he or she is 35 and where the signs that humanity will face up to the challenges of climate change and loss of biodiversity (the sixth extinction) are not altogether hopeful. I wish I could do more to protect him or her, future generations of my family, and other families, from the many threats to ‘Biosphere 1’ (planet Earth) and humanity’s very survival. This may be ‘out of scope’ for this particular application, but I have to ask, with all due respect:

What is this panel, and what are the EPA (and, I wonder, what are the Department of Conservation and the Ministry for the Environment and the New Zealand government and all the local, regional and national governments and bureaucracies of the world) going to do to ensure that the interests of the ecosystem on which we all depend are put FIRST, ahead of those of multi-billion-dollar agrochemical multinationals with short-term interests in maximum profit and apparently scant concern for long-term sustainability?

Thank you again for the opportunity to talk to you today. I know you are called upon to make a limited decision after this hearing, but please do follow up on the wider research and keep asking the bigger questions.

Resources mentioned in my presentation, in the order in which they appeared:

<http://www.independent.co.uk/news/science/the-12-terrifying-ways-researchers-think-human-civilisation-is-most-likely-to-end-10046945.html>

(article published in *The Independent*, Sunday 15 February, 2015. I came to this article online via a link from the online Weekend Environment Reader, Sunday, February 15, 2015, edition of The Daily Climate <dailyclimate@newsletters.dailyclimate.org>)

Richard Wilkinson and Kate Pickett, *The Spirit Level: Why Equality is Better for Everyone*, Penguin, 2010.

Ha-Joon Chang, *Economics: The User's Guide*, Pelican, 2014, and

23 Things They Don't Tell You About Capitalism, Penguin, 2011.

Elizabeth Kolbert, *The Sixth Extinction* (Kindle edition)

Tony Juniper, *What Has Nature Ever Done for Us?* (Kindle edition)

Rachel Carson, *Silent Spring*, Houghton Mifflin, 1962. Re-issued 50 years later: if you have time, read Margaret Attwood's piece in the *Guardian*, Friday 7 December 2012, at <http://www.theguardian.com/books/2012/dec/07/why-rachel-carson-is-a-saint>

Donnella Meadows, *et al.* (the Club of Rome), *Limits to Growth*, 1972. See <http://www.clubofrome.org/?p=326>

Barry Commoner, *The Poverty of Power: Energy and the Economic Crisis*, Bantam Books, 1976.

Barry Commoner, *The Closing Circle: Nature, Man and Technology*, Random House, 1971.

Tony Juniper, 'What Has Nature Ever Done for Us?', Presentation published (5 Feb 2014) on YouTube by Synergetic Press at <https://www.youtube.com/watch?v=dYxAddIkQbQ> (40 minutes 19 seconds long)

sustainabletable.org; statista.com

-- and some of the written submissions from other submitters, and the US EPA document that follows as an appendix on the next page. (Formatting of the EPA document is slightly different as for unknown reasons I could neither 'Insert file' to put the whole document in nor copy and paste in the exact same format.)

<http://www.epa.gov/pesticides/factsheets/ipm.htm> Last updated on 5 August 2014



Pesticides: Topical & Chemical Fact Sheets

You are here: EPA Home Pesticides About Pesticides Fact Sheets Health and Safety Integrated Pest Management (IPM) Principles

Integrated Pest Management (IPM) Principles

Este Web page está disponible en español

1. What is IPM?
2. How do IPM programs work?
 - Set Action Thresholds
 - Monitor and Identify Pests
 - Prevention
 - Control
3. Do most growers use IPM?
4. How do you know if the food you buy is grown using IPM?
5. If I grow my own fruits and vegetables, can I practice IPM in my garden?
6. For more information_____

Resources

- PestWise
- Pesticides and Food: What "IPM" Means
- IPM in Schools
- Household IPM

1. What is IPM?

Integrated Pest Management (IPM) is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices. IPM programs use current, comprehensive information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods, is used to manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment.

The IPM approach can be applied to both agricultural and non-agricultural settings, such as the home, garden, and workplace. IPM takes advantage of all appropriate pest management options including, but not limited to, the judicious use of pesticides. In contrast, *organic* food production applies many of the same concepts as IPM but limits the use of pesticides to those that are produced from natural sources, as opposed to synthetic chemicals.

2. How do IPM programs work?

IPM is not a single pest control method but, rather, a series of pest management evaluations, decisions and controls. In practicing IPM, growers who are aware of the potential for pest infestation follow a four-tiered approach. The four steps include:

Set Action Thresholds

Before taking any pest control action, IPM first sets an action threshold, a point at which pest populations or environmental conditions indicate that pest control action must be taken. Sighting a single pest does not always mean control is needed. The level at which pests will either become an economic threat is critical to guide future pest control decisions.

Monitor and Identify Pests

Not all insects, weeds, and other living organisms require control.

Many organisms are innocuous, and some are even beneficial. IPM programs work to monitor for pests and identify them accurately, so that appropriate control decisions can be made in conjunction with action thresholds. This monitoring and identification removes the possibility that pesticides will be used when they are not really needed or that the wrong kind of pesticide will be used.

Prevention

As a first line of pest control, IPM programs work to manage the crop, lawn, or indoor space to prevent pests from becoming a threat. In an agricultural crop, this may mean using cultural methods, such as rotating between different crops, selecting pest-resistant varieties, and planting pest-free rootstock. These control methods can be very effective and cost-efficient and present little to no risk to people or the environment.

Control

Once monitoring, identification, and action thresholds indicate that pest control is required, and preventive methods are no longer effective or available, IPM programs then evaluate the proper control method both for effectiveness and risk. Effective, less *risky* pest controls are chosen first, including highly targeted chemicals, such as pheromones to disrupt pest mating, or mechanical control, such as trapping or weeding. If further monitoring, identifications and action thresholds indicate that less risky controls are not working, then additional pest control methods would be employed, such as targeted spraying of pesticides. Broadcast spraying of non-specific pesticides is a last resort.

3. Do most growers use IPM?

With these steps, IPM is best described as a continuum. Many, if not most, agricultural growers identify their pests before spraying. A smaller subset of growers use less risky pesticides such as pheromones. All of these growers are on the IPM continuum. The goal is to move growers further along the continuum to using all appropriate IPM techniques.

4. How do you know if the food you buy is grown using IPM?

In most cases, food grown using IPM practices is not identified in the marketplace like *organic* food. There is no national certification for growers using IPM, as the United States Department of Agriculture has developed for organic foods. Since IPM is a complex pest control process, not merely a series of practices, it is impossible to use one IPM definition for all foods and all areas of the country. Many individual commodity growers, for such crop as potatoes and strawberries, are working to define what IPM means for their crop and region, and IPM-labeled foods are available in limited areas. With definitions, growers could begin to market more of their products as *IPM-Grown*, giving consumers another choice in their food purchases.

5. If I grow my own fruits and vegetables, can I practice IPM in my garden?

Yes, the same principles used by large farms can be applied to your own garden by following the four-tiered approach outlined above. For more specific information on practicing IPM in your garden, you can contact your state Extension Services for the services of a Master Gardener.

6. For More Information on IPM

- Pesticides and Food: What "Integrated Pest Management" Means
- EPA is encouraging the innovation of biological pesticides, also known as biopesticides.
- Find your state's Extension Service
- Pesticide Environmental Stewardship Program (PESP)
- Radcliffe's IPM World Textbook
- IPMNet