The Myths of Safe Pesticides Protecting our Children

IFOAM – Organics International

The global umbrella body for the whole organic sector.

People

800 member organizations in 125 countries worldwide.

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EcoFarms Conference
Asilomar, California, January 20, 2016
Andre Leu, President

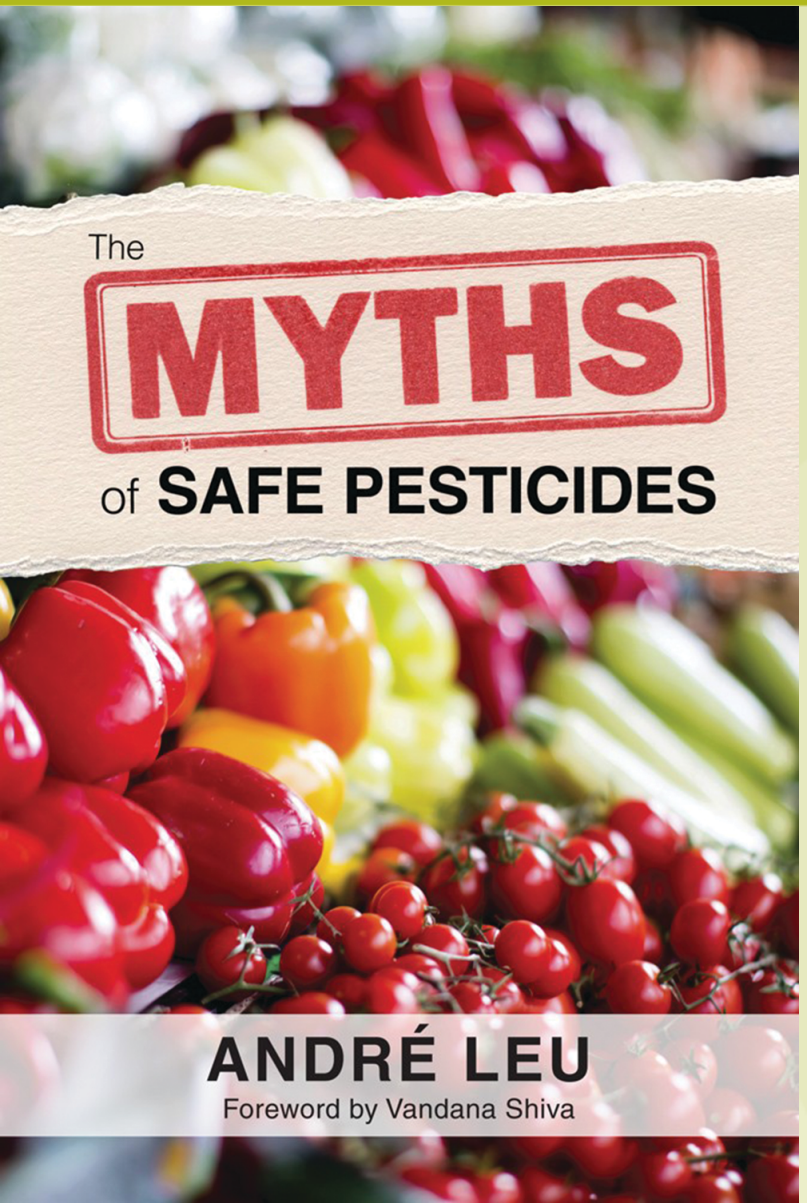
The Drivers of Growth

The Organic Sector is Consumer Driven

- The authorities say that the pesticide residues in food are safe

- Therefore there is no need or value in purchasing and eating organic food
- This needs to be critically examined

Is the current use of Pesticides Safe?



A critical analysis pesticides and human health based on published peer reviewed science

All statements cite the published science

The Myths of Safe Pesticides

MYTH 1: Rigorously Tested "All agriculture poisons are scientifically tested to ensure safe use"

- Most pesticide formulations sold on the market are deemed safe on the basis of just testing one of the ingredients without testing the whole formulation.
- It is a data-free assumption to assume there is no difference in toxicity between the active ingredient and the whole formulation
- It also defies scientific credibility when these' inerts' are added as synergists and adjuvants to make the active ingredient kill more effectively and then assume that they are not more toxic.
- The limited scientific testing of formulated pesticide products shows that they can be hundreds of times more toxic to humans than the pure single active ingredient.

The Myths of Safe Pesticides

MYTH 1: Rigorously Tested "All agriculture poisons are scientifically tested to ensure safe use"

- There is some testing for acute toxicity for formulated pesticides – the amount that will kill in two weeks from exposure
- The 1400 registered agricultural and veterinary products sold in the USA and 7200 in Australia – the product used on our food – have:
- ***no testing for children's health, reproductive effects, birth defects, cancer, developmental neurotoxicity, endocrine disruption, metabolic disruption and epigenetic mutations***
- and numerous other issues that could be caused by the whole formulation

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The Myths of Safe Pesticides

MYTH 1: Rigorously Tested "All agriculture poisons are scientifically tested to ensure safe use"

- Multiple pesticides (insecticides, herbicides, fungicides) are approved for each crop
- Many foods have multiple residues
- Most people have multiple residues in their bodies
- No testing of chemical cocktails
- Many mixtures are synergistic 1+1=3 or much more
- Up to 232 chemicals found in placental cord blood
- It is data-free assumption to assume that there are no additive or synergistic toxic effects from cocktails

The Myths of Safe Pesticides

MYTH 1: Rigorously Tested "All agriculture poisons are scientifically tested to ensure safe use"

- The special requirements of the fetus, the newborn, and the growing child in relation to developmental neurotoxicity are also subject to data-free assumptions.

- Currently the pesticide testing used in the regulatory approval processes does not specifically test for the risks particular to these age groups.

- Peer reviewed testing shows that these groups are particularly vulnerable to the smallest amounts of pesticides.

The Myths of Safe Pesticides

MYTH 2: Very Small Amount "The residues are too low to cause any problems"

- The smallest amounts of chemical residues can be harmful.

- Given that there are hundreds of studies showing that many chemicals can be endocrine disruptors and therefore more toxic at lower doses, setting the Average Daily Intake (ADI) on the basis of extrapolating it from testing done at higher doses is a data-free assumption.

The Myths of Safe Pesticides

MYTH 3: Breakdown "Modern pesticides rapidly biodegrade"

- All synthetic pesticides leave residues in food, that is why Maximum Residue Levels (MRL) and Average Daily Intakes (ADI) are set
- Testing shows that the majority of foods and people have pesticide residues

- Lack of testing for the metabolites formed by pesticides as they degrade
- Limited testing shows that many of them are more toxic and residual than the pesticide itself

The Myths of Safe Pesticides

MYTH 4: Reliable Regulatory Authorities "Trust us — we have it all under control"

- Regulatory authorities are ignoring a large body of peer reviewed science showing the harm of caused by pesticides and are largely basing their decisions on unpublished industry, commercial in confidence studies that are not available for other researchers and stakeholders.
- The lack of a transparent system where stakeholders are denied access to the studies and decision about this studies is a huge concern. The public has The Right To Know about the studies and decision used to justify poison residues in food.

- The scientific credibility of pesticide regulatory authorities has to be seriously questioned when they are approving the use of pesticides on the basis of data-free assumptions and not on the published peer reviewed science

The Myths of Safe Pesticides

MYTH 5: Pesticides are Essential to Farming "We will starve to death without pesticides"

- There are many examples where organic systems are getting equal to higher yields than conventional farming
- Most research spent on pesticide based systems
- Less that 0.5% of agricultural research is spent on solutions applicable to organic/agroecological systems
- Agricultural research % of funding needs to be dramatically increased to further improve and scale up these high yielding organic/agroecological/regenerative systems
- This will benefit all farming systems, not just organic, in achieving high yields without synthetic pesticides

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The Myths of Safe Pesticides

The Rigorously Tested Myth
Children, newborn and the fetus

Pesticide damage in developing children causes:

- Lower IQs
- ADHD
- Autism spectrum disorders
- Lack of physical coordination
- Loss of temper – anger management issues
- Bipolar/schizophrenia spectrum of illnesses
- Depression
- Childhood obesity

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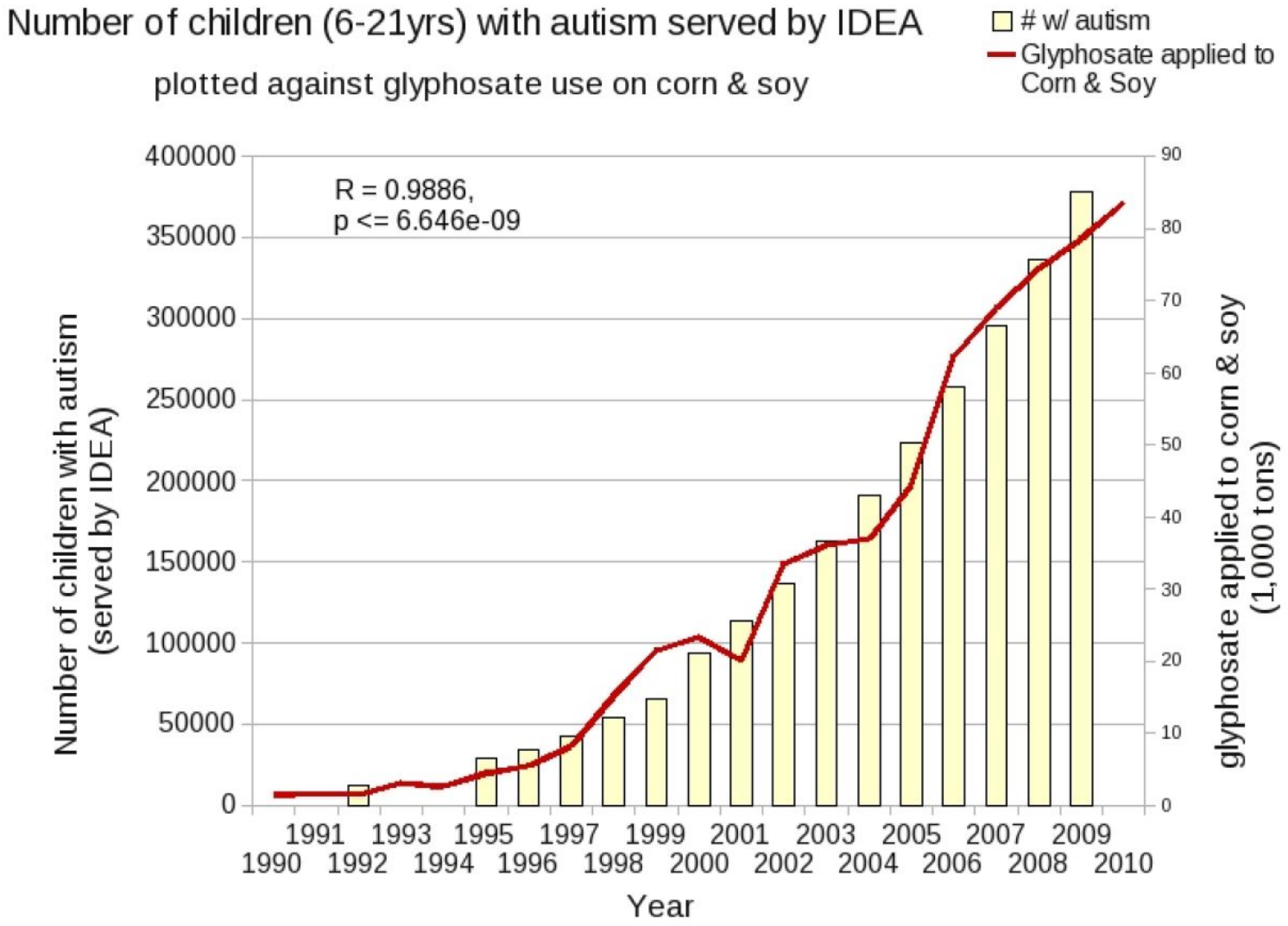
The Myths of Safe Pesticides



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The Myths of Safe Pesticides

The Rigorously Tested Myth

The US President's Cancer Panel

80% of cancers are caused environmental toxins, especially chemicals and pesticides

Exposure to chemical cocktails

'…Leukemia rates are consistently elevated among children who grow up on farms, among children whose parents used pesticides in the home or garden, and among children of pesticide applicators.'

'Yet over the same period (1975–2006), cancer incidence in U.S. children under 20 years of age has increased.'

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The Myths of Safe Pesticides

The Rigorously Tested Myth

Children, newborn and the fetus

The US President's Cancer Panel

'Children also can be harmed by genetic or other damage resulting from environmental exposures sustained by the mother (and in some cases, the father).'

'There is a critical lack of knowledge and appreciation of environmental threats to children's health and a severe shortage of researchers and clinicians trained in children's environmental health.'

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The Rigorously Tested Myth
Exposure to chemical cocktails

- In experiments conducted by Warren Porter et al. at the University of Wisconsin-Madison, mice were given drinking water with combinations of pesticide, herbicide and nitrate, at concentrations currently found in groundwater in the USA

- They exhibited altered immune, endocrine and nervous system functions (Porter 1999).

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The Rigorously Tested Myth

Exposure to chemical cocktails

- Of particular concern was thyroid disruption in animals
- This has multiple consequences including effects on brain development, sensitivity to stimuli, ability or motivation to learn and an altered immune function

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The Myths of Safe Pesticides

The Rigorously Tested Myth

Children, newborn and the fetus

•Scientific research shows that pesticides effect the normal development of the nervous system in the fetus and children

•The brain is the largest collection of nerve cells

'These results indicate that chlorpyrifos and other organophosphates such as diazinon have immediate, direct effects on neural cell replication.' (Qiao 2001)

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The Myths of Safe Pesticides

The Rigorously Tested Myth

Children, newborn and the fetus

‘In light of the protective effect of serum proteins, the fact that the fetus and newborn possess lower concentrations of these proteins suggests that greater neurotoxic effects may occur at blood levels of chlorpyrifos that are nontoxic to adult.’ (Qiao 2001)

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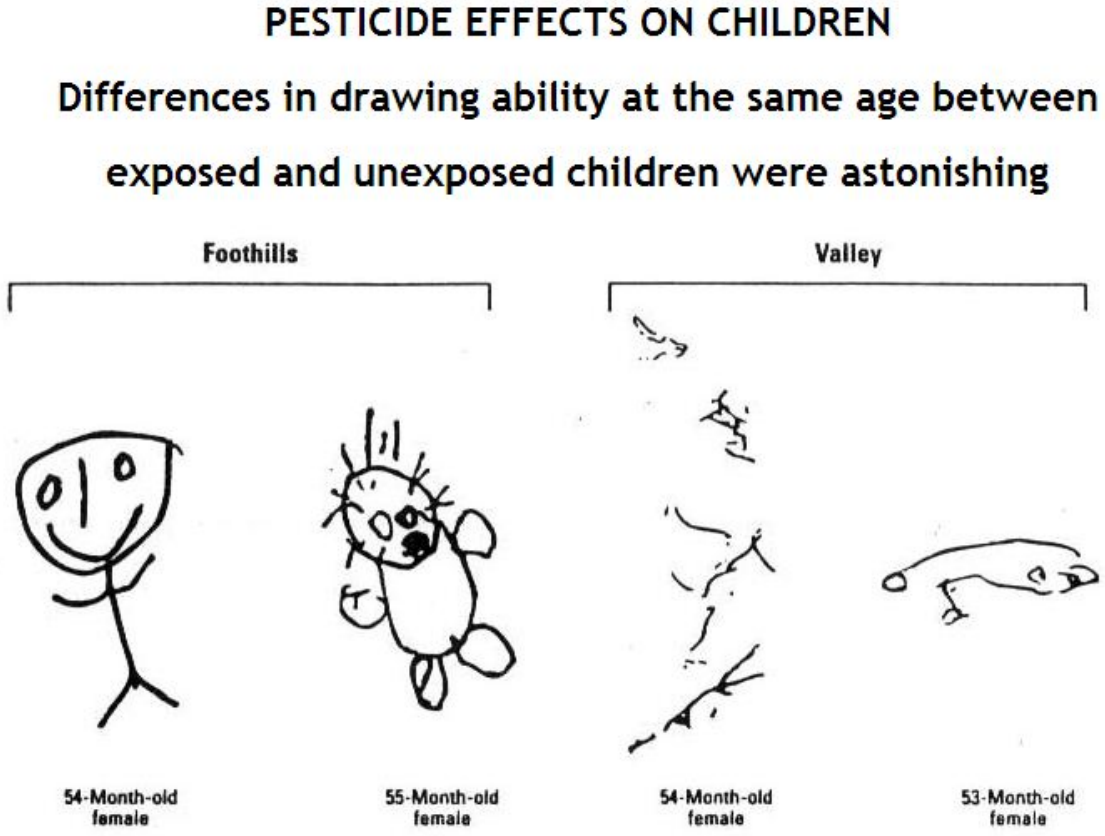

1. Representative drawings of a person by 4-year-old Yaqui children from the valley and foothills of Sonora, Mexico.

E. A. Guillette et al, "An Anthropological Approach to the Evaluation of Preschool Children Exposed to Pesticides in Mexico," Environmental Health Perspectives, 106(6):347-53, June 1998.

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The Myths of Safe Pesticides

The Rigorously Tested Myth
Children, newborn and the fetus

- Four recent studies show that prenatal exposure to organophosphate insecticides (OPs) adversely affects the neurological development of children.

  (Rauh et al., 2011, Rauh et al., 2012, Bouchard et al., 2011, Engel et al., 2011)

- Each study was conducted independently; however they all came up with very similar results.
- This was that fetal exposure to small amounts of OPs will reduce the IQ of children.

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The Myths of Safe Pesticides

The Rigorously Tested Myth
Children, newborn and the fetus

- Parents should have considerable concern that the Columbia University study found that there was no evidence of a minimum level of exposure in the observed adverse impact on intelligence.

- This means that very low levels of exposure could lead to reductions in a child's intelligence

- ***Most people get their exposure from residues in food***

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The Myths of Safe Pesticides

The Rigorously Tested Myth
Children, newborn and the fetus

- The scientific study published in the peer reviewed journal Proceedings of the National Academy of Sciences of the United States of America in March 2012 has confirmed the finding of previous studies. (Rauh et al., 2012)

- Shows a large range of brain abnormalities in children who were exposed to chlorpyrifos in utero through normal non occupational uses.

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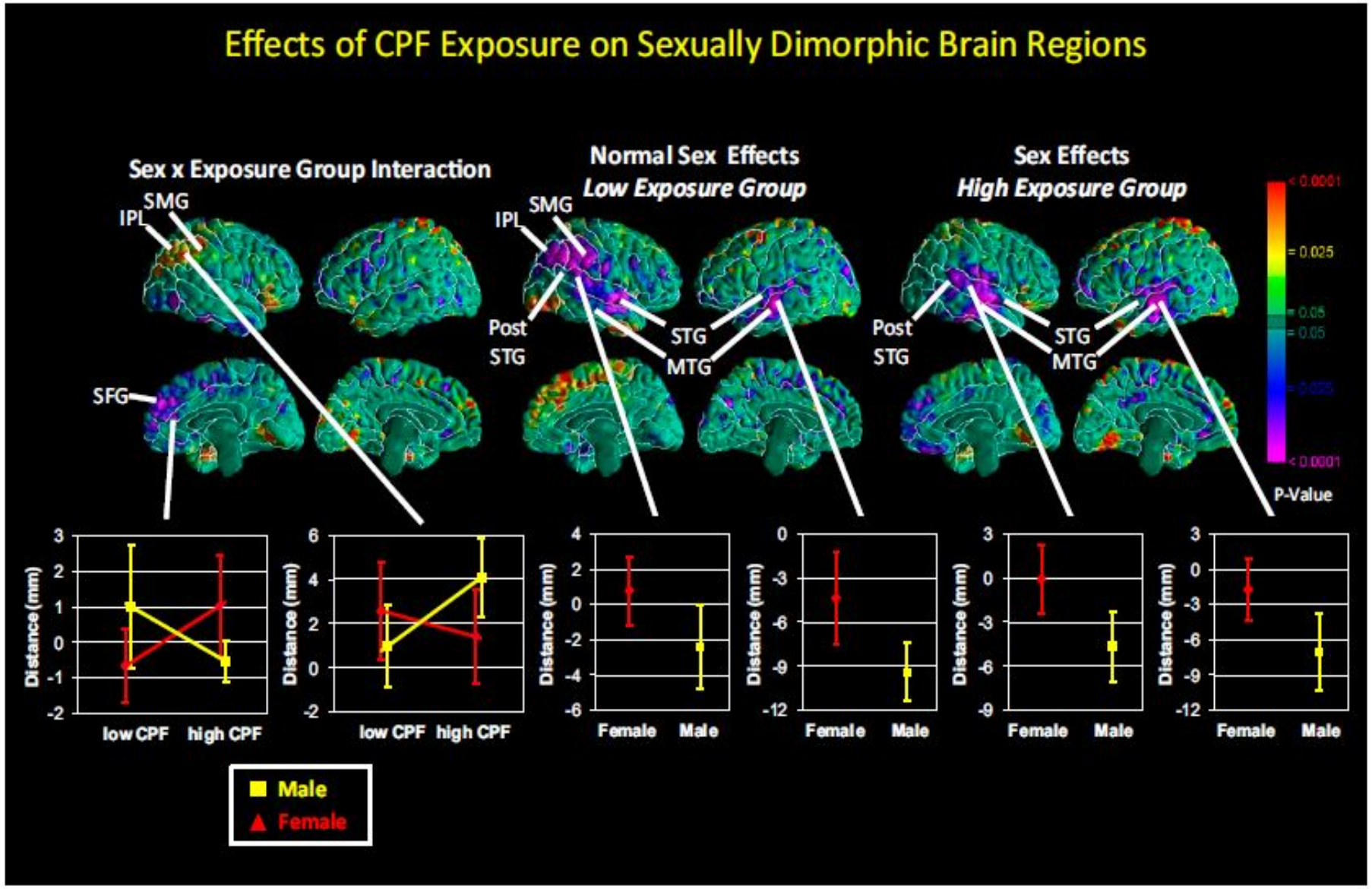

Organic Corn - 1995 Drought

Picture: Rodale Institute

High Yield Regenerative Organic Agriculture

The average corn yields during the drought years were from 28% to 34% higher in the two organic systems.

The yields were 6,938 and 7,235 kg per ha in the organic animal and the organic legume systems, respectively, compared with 5,333 kg per ha in the conventional system (Pimentel et al. 2005)

Lbs per Acre = Kg per ha (close enough)

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The Wisconsin Integrated Cropping Systems Trials

Organic yields were higher in drought years, the same as conventional in normal weather years and lower in very wet years. (Posner et al 2008)
Flame and steam weeding, acetic acid?

High Yield Regenerative Organic Agriculture

Iowa State University Long Term Agroecological Research

- organic corn harvests averaged 130 bushels per acre while conventional corn yield was 112 bushels per acre
- organic soybean yield was 45 bu/ac compared to the conventional yield of 40 bu/ac in the fourth year (Delate, 2010).

Washington State University Study

- compared the economic and environmental sustainability of conventional, organic and integrated growing systems in apple production and found similar yields (Reganold et al., 2001).

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High Yield Regenerative Organic Agriculture

- A report by the United National Conference on Trade and Development (UNCTAD) and the United Nations Environment Programme (UNEP) stated on Organic Agriculture:
- 114 projects in 24 African Countries covering 2 million hectares and 1.9 million farmers
- *'…the average crop yield was … 116 per cent increase for all African projects and 128 per cent increase for the projects in East Africa.'*
- *Organic Agriculture and Food Security in Africa 2008*
- 80% of the food consumed in the developing world comes from small (5 acres or less) family farmers (FAO)
- The vast majority of the world's food insecure people live in the developing world (FAO)

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High Yield Regenerative Organic Agriculture

- Organic yield 2.7 times more per ha than conventional farms in developing countries; (Badgley et al., 2007)

- Small farms are 2 to 4 times more energy efficient than large conventional farms. (Chapell and Lavalle, 2009)

Tigray, Ethiopia

High over-grazing and burning = Deep, wide and long erosion gullies

Low soil organic matter = Low soil fertility

Serious food insecurity in dry years

Thousands died in famines

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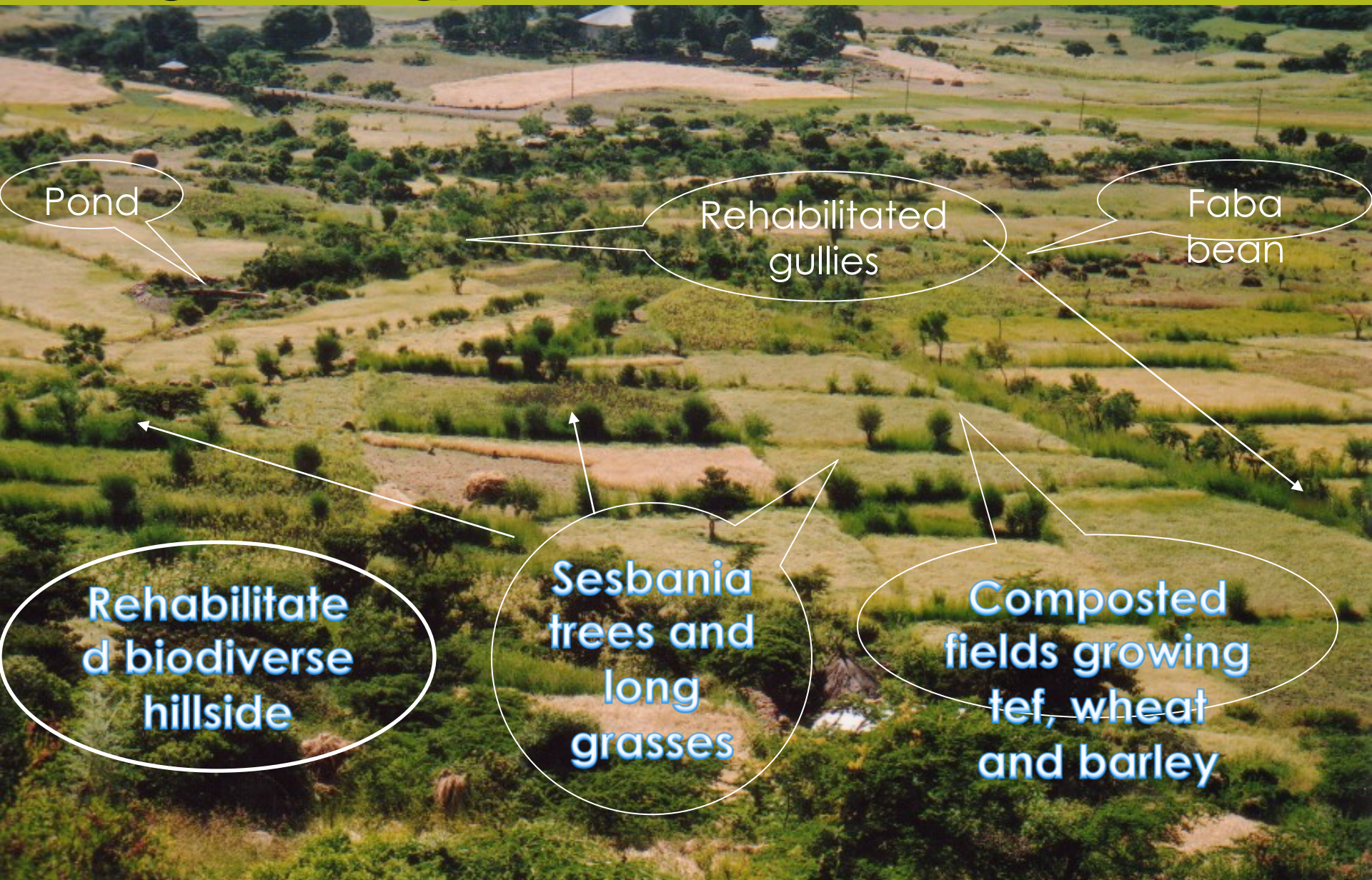
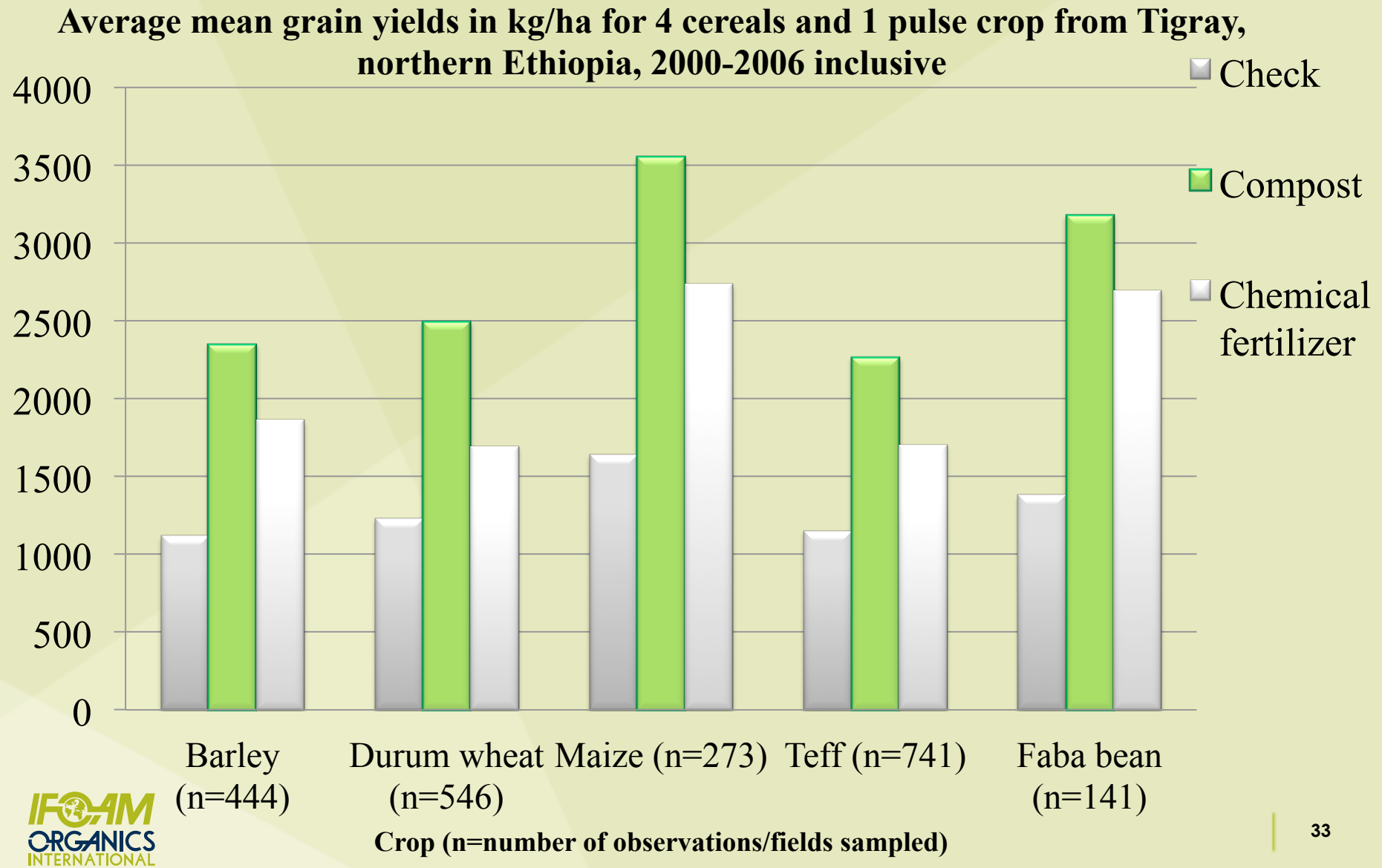
Adi Nefas, Tigray, Ethiopia - Agroecology



Impact of using compost - Grain yields from over 900 samples from farmers fields over 7 years



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Push-Pull Adapted to New Crops

Intercropping to fix N for free

Desmodium repels pests, suppresses weeds (selective allelopathy), provides fodder

Alfalfa hosts beneficial insects

Napier grass traps pests

Push Pull and insectaries in a mango orchard gives total pest control

Chilies grown with desmodium and alfalfa

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Conclusion

- There is no need for a toxic food system that is clearly damaging our health
- Children are the most vulnerable
- Regenerative organic farming can increase food security
- It can reverse climate change by pulling CO_2 out of the atmosphere and storing it in the soil as organic matter
- Increasing Soil Organic Matter improves water capture, resilience and yields in the uncertain weather extremes of climate change

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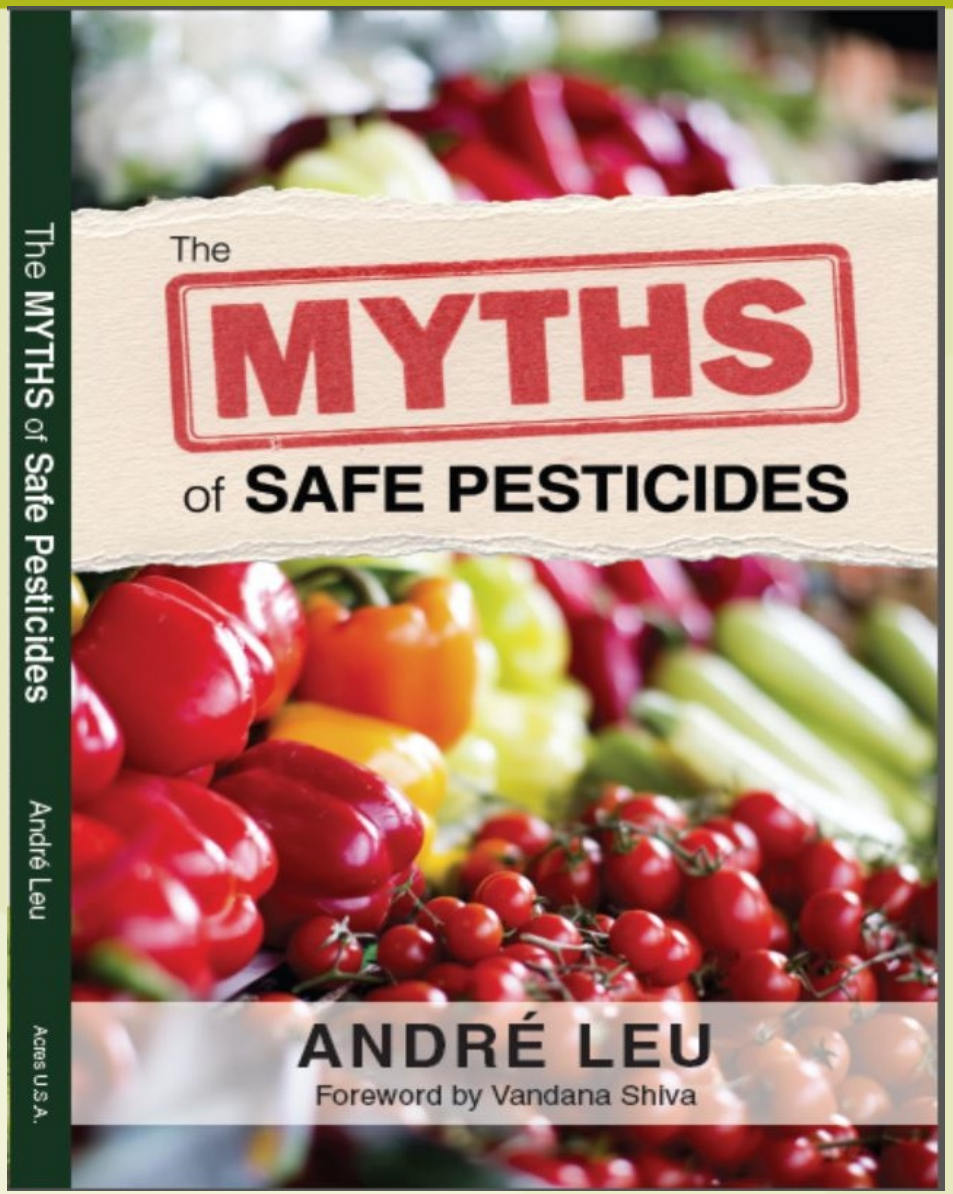

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