

The Case Against Pesticides

by S. M. Brander

If you were asked to come up with a list of things that are poisonous, that list might include things like arsenic, rattlesnake venom, and maybe anthrax. Luckily most of us rarely encounter any of these. However, we rarely think about our daily exposure to small amounts of poison, such as the pesticides and herbicides that are sprayed

initially foresee. It's a bit like taking a drug that you haven't been prescribed.

Recent research has shown that commonly used pesticides and herbicides such as glyphosate (i.e. Roundup®), pyrethroids (i.e. Talstar®, Biomist®), carbaryl (i.e. Sevin®), and neonicotinoids (i.e. Gaucho®) are toxic both to humans and ecosystems. Neonicotinoids and pyrethroids appear

organic, try to at least avoid the "Dirty Dozen." (See following page.) For example, according to Consumer Reports, in the U.S. as little as one conventionally treated apple can cause they typical 3-4 year old child to enter the high dietary risk range for a number of pesticide types.

A recent study done on a family in Sweden that eliminated pesticides from their diet for just one week showed that all family members reduced their pesticide load (detected in urine); particularly the children whose levels dropped by nearly a factor of 10. There are local sources of organic produce as well as plenty of places to purchase such products (e.g., Tidal Creek, Lovey's, Whole Foods, Harris Teeter). If you grow your own produce or decorative plants, try to purchase organic seeds that aren't infused with pesticides (i.e. neonicotinoids), which are toxic to pollinators and to us as well.

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"Someday we shall look back on this dark era of agriculture and shake our heads. How could we have ever believed that it was a good idea to grow our food with poisons?"

— Jane Goodall

on the produce we eat, in our homes, and on our backyards. Most of us think that if we aren't immediately sickened by something, that it isn't harmful. It turns out, however, that many of the seemingly harmless chemicals we use to control insects can also affect us.

The reason for this is that we are more like insects than we think, at least when you shrink things down to the level of the cell. All complex living things, insects included, are made up of them, and we all evolved from common ancestors so our cells are similar. The way a pesticide works is to interfere with the way a cell functions. If an insect stops moving upon being sprayed, it may be because the chemical blocked channels in its cells, for example, causing paralysis. Although humans don't become paralyzed when exposed to pesticides, some of the same channels or other proteins in our very own cells can be affected, causing changes our nervous or endocrine systems. Furthermore, sometimes pesticides (and herbicides) interact with parts of the cell that scientists don't

to affect the developing nervous system (particularly in fetuses and young children), and both glyphosate and carbaryl are suspected carcinogens. Exposure to multiple pesticides at once compounds the problem, as little is known about the effects of mixtures.

Connecting the dots between effects on insects and unintended impacts on wildlife is a bit easier. For example, aquatic invertebrates such as crustaceans are very similar physiologically to insects, hence their high sensitivity to pesticides. Fish are impacted because they are exposed constantly as run-off enters rivers and estuaries. Many studies on aquatic life have linked declines in reproduction and the ability to avoid predation to pesticide exposure. Another issue is that not all insects are targets, so valuable pollinators such as honeybees have fallen victim to the cocktail of chemicals sprayed on or around the flowering plants that they frequent. We now have a serious bee shortage, one that has been linked to a combination of disease and pesticides such as neonicotinoids. These chemicals not only end up in local ecosystems, but can be taken up into global air and water currents and deposited as far away as the poles, where pesticides have been detected in penguin eggs and the tissues of polar bears.

So how does one reduce his or her pesticide footprint? Eating organic as much as possible is one of the easiest ways to start. If it's not in the budget to go completely



Some Local Sources of Organic Produce

- Indigo Farms, Calabash, NC
<http://www.indigofarmsmarket.com/>
- Black River Organic Farm, Sampson Co., NC
<http://blackriverorganicfarm.com/>
- Vollmer Farm, Bunn, NC
<http://www.vollmerfarm.com/>

environmental science

Pesticides – continued

Living in Southeastern NC, one is bound to encounter insects around every corner. It is therefore understandable that many resort to treating their homes and lawns. However, there are some better alternatives to Mosquito Squad and Mosquito Authority, both of which use pyrethroids—shown to interfere with hormone function in wildlife and in human cells, in addition to being neurotoxic. Often companies will advertise pyrethroid pesticides as being “botanically derived.” The reason for this is that they are based on a natural chemical produced by chrysanthemum flowers, but that chemical has been synthetically modified and is anything but natural. A better alternative is pyrethrin, the actual natural chrysanthemum compound, or even better yet, orange oil is known to repel many types of insects, is food-safe and is also organic-certified. Products such as Orange Guard® are available at hardware stores such as Ace, Lowe’s, and Home Depot. A third option is to choose plants that repel mosquitos, such as basil or citronella. Some of the essential oils derived from such plants are used in natural insect repellent skin sprays, sold by companies such as Babyganics and Burt’s Bees.

Although no single action will solve the global problem of pesticide pollution, these are all examples of small steps individuals can take to reduce their overall footprint on the environment and to potentially improve the health of their families and themselves. As Margaret Mead once said

Insert-Repelling Oils & Plants

Lavender
Basil
Thyme
Pine
Vetiver
Bergamot
Peppermint
Tea Tree (Australian)
Eucalyptus
Lemon eucalyptus
Citronella
Garlic
Lemon balm
Catnip
Marigolds
Pennyroyal
Rosemary
Geranium

“Never doubt that a small group of thoughtful, committed citizens can change the world, indeed, it’s the only thing that ever has.”

Sources: www.ewg.org;
www.naturallivingideas.com;
www.info.achs.edu.



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Helpful Websites

Environmental Working Group

www.ewg.org

Consumer Reports Health

www.consumerreports.org/cro/health/natural-health/pesticides/index.htm.

Learn the Dirty Dozen and the Clean Fifteen

Decrease your exposure to pesticides by learning which of our foods are most and least likely to bring pesticides to the table.

Dirty Dozen

Each of these foods tested positive for a number of different pesticide residues and showed higher concentrations of pesticides than other produce items.

Key findings:

- 99 percent of apple samples, 98 percent of peaches, and 97 percent of nectarines tested positive for at least one pesticide residue.
- The average potato had more pesticides by weight than any other produce.
- A single grape sample and a sweet bell pepper sample contained 15 pesticides.
- Single samples of cherry tomatoes, nectarines, peaches, imported snap peas and strawberries showed 13 different pesticides apiece.
- Leafy greens - kale and collard greens - and hot peppers do not meet traditional Dirty Dozen™ ranking criteria but were frequently found to be contaminated with insecticides toxic to the human nervous system.

Dirty Dozen (plus)

Apples
Peaches
Nectarines
Strawberries
Grapes
Celery
Spinach
Sweet bell peppers
Cucumbers
Cherry tomatoes
Snap peas (imported)
Potatoes
Hot peppers
Kale / collard greens
Blueberries

Clean Fifteen

Produce that is least likely to contain pesticide residues.

Key findings:

- Avocados were the cleanest: only 1 percent of avocado samples showed any detectable pesticides.
- Some 89 percent of pineapples, 82 percent of kiwi, 80 percent of papayas, 88 percent of mango and 61 percent of cantaloupe had no residues.
- No single fruit sample from the Clean Fifteen™ tested positive for more than 4 types of pesticides.
- Multiple pesticide residues are extremely rare on Clean Fifteen™ vegetables. Only 5.5 percent of Clean Fifteen samples had two or more pesticides.

Source: www.ewg.org

Clean Fifteen

Avocados
Sweet corn
Pineapples
Cabbage
Sweet peas (frozen)
Onions
Asparagus
Mangos
Papayas
Kiwi
Eggplant
Grapefruit
Cantaloupe
Cauliflower
Sweet potatoes