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Right Chemistry: We need rational discussion about pesticides, without rhetoric

By Joe Schwarcz, Special to The Gazette October 10, 2014

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While no pesticide is completely risk-free, fear-mongering about them is not helpful, Joe Schwarcz says.

Photograph by: TED ALJIBE , AFP/Getty Images

David Copperfield performed many an illusion on his television specials with his hair blowing in the wind, tussled by an offstage fan. I was reminded of that effect by an episode of the Dr. Oz show in which the hot air so often generated by the host was amplified by a fan à la Copperfield. And Oz, too, was performing a sort of illusion if we go by the definition of the term as “something that deceives by a false perception or belief.” In this case, Oz dumped a bunch of yellow feathers on a patch of synthetic turf adorned with some synthetic plants to demonstrate pesticide drift. The flurry of feathers was meant to illustrate how neighbouring fields, as well as people who happen to be nearby, may be affected. A powerful visual skit to be sure, but a gross misrepresentation of the risks posed by pesticide drift.

The reason for the demo at this particular time was that, in Oz’s words, “the Environmental Protection Agency is on the brink of approving a brand new toxic pesticide you don’t know about.” The reference was to Enlist Duo, a mixture of the weed killers glyphosate and 2,4-D (short for 2,4-dichlorophenoxyacetic acid), designed to be used on corn and soy grown from seeds genetically engineered to

resist these herbicides. Fields can then be sprayed to kill weeds without harming the crops. Enlist Duo is already approved in Canada.

The need for the new combination was generated by the development of resistance to glyphosate by weeds in fields planted with crops genetically modified to tolerate this herbicide. Such resistance has nothing to do with genetic modification, it is a consequence of biology, since some members of a target species will have a natural resistance to a pesticide and will go on to reproduce and yield offspring that are also resistant. Eventually, the whole population becomes resistant. This is the same problem we face today with bacteria developing resistance to antibiotics.

Oz got one thing right. Pesticides are toxic. That's exactly why they are used. And that is why there is extensive research about their effects and strict regulation about their application. Remember that there are no "safe" or "dangerous" chemicals, just safe or dangerous ways to use them. As far as 2,4-D and glyphosate go, there is nothing new here, since both of these have been widely used for years, although not in this specific combination. What is new is the development of crops resistant to 2,4-D, which will allow for its use to kill weeds in corn and soy fields, something that was not possible before. This has raised alarm among those who maintain that 2,4-D is dangerous and that its increased use is going to affect human health. Dr. Oz apparently is of this belief, and as the feathers were flying around the stage, he chimed in with how "2,4-D is a chemical that was used in Agent Orange which the government banned during the Vietnam War."

2,4-D, was indeed one of the components in the notorious Agent Orange used to defoliate trees in Vietnam. Tragically, it was later found to be contaminated with tetrachlorodibenzodioxin (TCDD), a highly toxic chemical linked to birth defects and cancer. This dioxin, however, has nothing to do with 2,4-D. It was inadvertently formed during the production of 2,4,5-trichloroacetic acid, or 2,4,5-T, the other component in Agent Orange. That is why the production of 2,4,5-T, but not 2,4-D, was banned.

It is deceitful to imply that the new herbicide is dangerous because it contains the harmful compound that was used in Agent Orange. Not only does Enlist Duo not contain any TCDD, the form of 2,4-D it does contain is also different from what was used in Vietnam. Enlist Duo is formulated with "2,4-D choline" which is far less volatile than 2,4-D itself and has an even safer profile. While legitimate concerns can be raised about genetic modification, it is disingenuous to scare the public by linking the newly proposed herbicide to Agent Orange. It is also irresponsible to show videos of crops such as green peppers being sprayed, insinuating that Enlist Duo will be used on all sorts of crops whereas it would only be suitable for Dow's genetically engineered corn and soy.

Now on to the issue of pesticide drift, which can happen in two ways. Tiny droplets of the spray can be carried by air currents, and the chemicals can also evaporate and spread as a vapour after being deposited on a field in their liquid form. These are realistic concerns especially given that some schools are located in the vicinity of agricultural fields. But these are just the sort of concerns that are taken into account when a pesticide is approved. For example, one well-designed study concluded that a person standing about 40 metres from a sprayer would be exposed to about 10 microlitres of spray, of which 9 microlitres are just water. Calculations show that the amount of 2,4-D in the 1 microlitre is well within safety limits, and of course spraying isn't continuous, it is done a few times a year. Consider also that 2,4-D choline, which is what is found in Enlist Duo, has far lower volatility and tendency to drift than 2,4-D itself, further improving its safety profile.

While no pesticide can be regarded as risk-free, the portrayal of Enlist Duo by Dr. Oz amounts to unscientific fear mongering. His final comment that "this subjects our entire nation to one massive experiment and I'm very concerned that we're at the beginning of a catastrophe that we don't have to subject ourselves to" totally ignores the massive number of experiments that have been carried out on pesticides before approval, based on a scientific rather than an emotional evaluation of the risk versus benefit ratio. True, when it comes to pesticides, there is no free lunch. But without the judicious use of such agrochemicals producing that lunch for the close to 10 billion people who by 2050 will be lining up for it becomes a challenge. What we need is rational discussion, not the spraying around of feathers and ill-informed rhetoric in a deception-laden stage act. If I want deception on the stage, I'll stick to watching David Copperfield.

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