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## **Better living through chemicals**

If scientist Joe Schwarcz could communicate one point about chemicals to the public, it would be this: the presence of chemicals does not equate to the presence of risk.

Schwarcz, director of the Office of Science and Society at McGill University, said pesticides and chemicals are widely misunderstood. He discussed the facts and myths at the U.S. Grains Council summer meeting.

"Every year, we hear news about the dangers of pesticides," he said. "They say when you're eating an apple, you may be eating up to 30 different pesticides. What is true is that there are that many pesticides registered for use on apples. No farmer would ever use that many.

"Farmers may use two or three, and they test to see what pests are in their area. Pesticides are expensive, and they want to use as little as possible."

Today scientists are able to analyze data down to the parts per trillion level. The amount of pesticide detected in apples is nowhere near the amount thought to be dangerous, Schwarcz said.

### **Public Perceptions**

He also pointed out that scientists are not popular in the eyes of the public.

"People think that chemists are evil people locked up in a laboratory somewhere, thinking about what new cancer-causing pesticide to unleash on an unsuspecting public," he said. "This is the unfortunate mindset out there. The world chemical has become synonymous with toxic.

"People worry about chemicals and are frightened when they hear the word. It leads to confusion. People become disoriented and don't know who to listen to. They look for a chemical-free existence."

The truth is that nothing in the world is chemical free, Schwarcz said. Chemicals are the building blocks of all matter. The only thing that is chemical free is a vacuum.

But labeling products as chemical-free sells, because that's what people want.

"Chemicals are not to be feared, they're not to be worshipped — they're to be understood," Schwarcz said. "And that's what we try to do.

"Our challenge is to demystify science for the public, to try and make sure that people are updated on what happens in the world of science. We hope to foster critical thinking and separate sense from nonsense."

### **Pesticide Dangers**

People often ask Schwarcz if pesticides are dangerous. His answer is that it depends on the context and how it was used.

"The truth is that pesticides are inherently dangerous," he said. "You want to kill off pests and weeds. So you do want to keep out of there when pesticides are sprayed. Pesticides can be a potential problem. They have to be used safely. And they aren't used safely everywhere.

"You need the proper equipment and need to be properly trained. There are many cases of people who can't or don't read the label and don't understand that the chemical must be diluted."

In America, careful instructions are provided for the farmer to follow, Schwarcz said.

But no matter how careful you are, there always are risks. While scientists can determine acute effects of pesticides, it's not so easy to determine the effect of small-scale exposure over time.

"The documentation to get a pesticide registered takes years," Schwarcz said. "Research takes years, and then data is submitted. No matter what or how many studies you do, you cannot guarantee that something will be safe.

"We can easily determine acute effects, but subtle, chronic effects are a different matter. We get some insight into it when pesticides are out there and you learn about what it may do to the environment."

Through Schwarcz's eyes, the moral of the story is this: pesticides can pose risks. But the benefits quite possibly outweigh them.