

## Nicotine Addiction

From John

The venerable honey bee has been back in the news lately. Unfortunately when hearing about this master confectioner there is rarely good news. For several years we have been hearing about the 'mysterious' colony collapse disorder. While at first there was some mystery, conclusive evidence exists as to its root cause. Unfortunately this is often buried or obscured when reported. If you have never heard of a class of pesticides called neonicotinoids then let me introduce you. Unlike genetically engineered crops such as Bt (*Bacillus thuringiensis*) corn where a gene from the bacterium is inserted into the genetic material of the corn, neonicotinoids are an external treatment. It can be applied as a soil drench/chemigation (applied through irrigation water), foliar (applied by a sprayer) and most commonly, as a seed treatment.

Neonicotinoids are closely related (as a synthetic analogue) to the much better known drug nicotine. The toxicity of nicotine has long been documented in humans and it has long been used as a neuro-active botanical pesticide, meaning that it attacks and shuts down the nervous system. But like the genetically modified corn, these are systemic pesticides. Being a systemic pesticide means that it isn't 'on' the plant but actually 'in' it. While initially applied externally, neonicotinoids are designed to be taken into the plant tissue where they can reside in every cell. What this means is that the pesticide is active throughout the plant's entire life-cycle.

But how common is this class of pesticides? They are actually one of the most common pesticides in use because of their broad spectrum of use. Have you ever bought 'treated' seed for your garden, seen shiny blue cucumber seed? It is estimated that about 90% of conventional corn is treated with these chemicals. They are commonly used on canola, turf grass, sugar beets, soybeans, rice, nut trees, sunflowers and ornamental flowers. And what about produce? They are only used on a few fruit and vegetable crops such as cucumbers, melons, grapes, apples, oranges, pears, peaches, broccoli, cabbage, lettuce, spinach, potatoes, squash, peppers, eggplant, tomatoes, plums, nectarines, lime, kale, herbs, cauliflower, beans, beets... OK I am sure you get the point. They are used on absolutely everything. If it isn't organic it is almost guaranteed to be treated with neonicotinoids. In some ways, it's their ubiquity that makes them so sinister, perhaps even much more so than that of GMO crops. And no, no one is required to tell you that you are eating neuro-toxic nicotine in your side salad. You may have even heard

### ON DECK

The mix won't change up too much but we expect that the beets and carrots will take a little break and we will wrap up the squash, zuke and cuke routine in the next week or two.

this week about all the ornamental and flower plants marketed for 'bee friendly gardens' from the big box stores like Home Depot and Lowes that were actually treated with neonicotinoids making them function exactly antithetically to their intended purpose. This happened right here in Minneapolis!

But what is the big deal? Let's take colony collapse disorder as an example as it gets the most attention. When the honeybee collects pollen, the pollen and the nectar that comes in contact with the bee is laced with the pesticide. What you might expect is that it will take the contaminated pollen home and contaminate the honey and poison the rest of the colony. While this is possible, it generally doesn't work that way. As a neurotoxin it interferes with their ability to navigate, and they simply never make it home. This happens to bee after bee until there are simply no worker bees left and the hive dies. In fact it's actually quite rare to find dead bees at the hive. While a world without honey would be sad, this is really a minor concern.

Would you like to live off of the test-tube burger that made the presses in the past few weeks? You better learn to love it if we lose our pollinators. Honeybees are just one pollinator that our crops depend on for reproduction (the process that makes the fruit, nut, grain and so on). Honeybees, bumblebees, solitary bees, moths, butterflies, bats, birds and myriad other insects provide this function in cultivated and wild plants alike. While we focus on the honeybee (actually introduced from Europe) there are over 4000 species of native bees and over 700 butterfly species in the US. The agronomical impact is that between 75-90% of fruits, vegetables, nuts and grains or dependent on animal pollination for reproduction. This means that without pollinators, only about 1 out of 10 crops you depend on could continue to exist. Furthermore, this class of insecticides is 'broad spectrum' meaning in short that they kill almost any bug and can continue to infect untreated plants and continue to be toxic to wildlife because even after 5-6 years they leave persistent residuals in the soil. They are effective against butterflies and moths (Lepidoptera), beetles (Coleoptera), true bugs (Hemiptera) and many non-target species such as bees, ants and wasps (Hymenoptera), dragon and damselflies (Odonata), lacewings (Neuroptera). This is not a conclusive list but as you can see it surely goes well beyond that of

pollinators and includes many beneficial predatory organisms. Beyond the insect world there is mounting evidence that the White-nose syndrome that is killing off many bat colonies could be related to the immuno-depressive effects of neonicotinoids leaving them more vulnerable to the lethal fungal infection that is killing them. Neonicotinoids are also known to be toxic to birds, fish and amphibians. Other than bats, they seem to have little effect so far as we know on mammals, but are highly lethal to almost every other kind of animal and it stands to reason that chronic exposure in mammals will prove just as deadly.

This is much bigger even than the Rachel Carson moment brought about by Silent Spring. This is the DDT of this generation and it may even be much much worse. It is time we ban this class of chemicals that is literally putting the whole of our global ecosystems and agricultural systems at risk of complete and catastrophic collapse. I am not one to fear monger and loathe Henny-Penny reactions, nor do I like to speak in absolutes, but this is deadly serious. I frame this concern much in the way that I frame my concern over global climate change which is to say that the conversation is framed all wrong in public discourse. Like the climate change discussion, it is not the loss of nature and species that is the fundamental concern. While I do believe that the moral hazard of inaction is reprehensible and that we have a fundamental duty to be good stewards of this planet and of the species that reside here and to protect the wonderful gift we have been given to live on. Our ability to cause mass extinction and interrupt almost every natural cycle should spur us to question our values, actions and way of life. But the truth is, life is resilient. We will not wipe out life from the planet no matter how much damage we cause. Life will adjust, adapt and carry on in a new paradigm. The fundamental question is about our survival as a species. Whether it's by inaction or blithe ignorance; are we willing to play the decisive role in our own extinction while Earth moves on and thrives without us?

## News and Notes

- We will be hosting a pot-luck work party within the next few weeks. It will be on a Sunday. In the morning we will bring in the Onion harvest and in the afternoon we will break break. If you can't work you are still invited to be part of the afternoon meal. We will send out more details when we know for sure the onions are ready to come in from the field. Stay tuned!

### Featured Item

*This week we are excited to be bringing you the first garlic of the season. We usually try to offer green garlic but opted to hang onto it all until now because it was a little slower than most years. Your garlic this week is somewhere between green garlic and cured garlic. It needs about one more week to be completely cured. It should still be fresh for a few weeks on your counter but we're sure it won't last that long. We are giving out some of the smaller heads first and saving the bigger ones for later. The biggest and best ones we keep as seed stock for next years crop!*

## Recipe of the Week

### Grilled Corn Salad with Honey Dressing

#### Ingredients:

2 cups cherry tomatoes  
6 ears fresh corn  
1 onion, finely chopped  
2 cups arugula  
2 tablespoons canola oil  
1/2 bell pepper, finely chopped  
1/4 cup olive oil  
2 tablespoons honey  
1/4 cup lime juice  
1 garlic clove, minced  
1 teaspoon jalapeno, chopped  
2 tablespoons fresh cilantro, chopped  
salt and black pepper, to taste  
fresh parsley, to garnish

#### Directions:

- Preheat the broiler or grill to moderate. Remove the husks and silks from the corn.
- Rub the canola oil over the corn and season it with salt and black pepper. Broil or grill it for about 6 minutes or until the ears are golden brown.
- Let the corn cool down, then remove the kernels, and combine them with the cherry tomatoes, red onion, and red bell pepper.
- Combine the olive oil, honey, lime juice, garlic, jalapeno, and cilantro to make the salad dressing and add salt and black pepper to taste.
- Stir the dressing into the corn mixture. Arrange the arugula in a big serving bowl and top it with the corn mixture. Garnish the corn salad with the fresh parsley. Serve at room temperature.