The Overuse and Misuse of Pesticides

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Pesticide resistance is a major problem that few of us know anything about. What is it? It happens when a pesticide that we have used against a pest for years can no longer control that pest. In simple terms, a pesticide will no longer kill the pest. This is a billion dollar problem for US agriculture. In 1999 the cost of pesticides and the yield loss of crops to pesticide resistance was estimated at $1.5 billion in the United States alone. In 1996 it was estimated that over 500 insects were resistant to one or more pesticides commonly used to control them. There were also 270 weed species, over 150 plant pathogens and a half dozen species of rats that were resistant. Those numbers have only grown in the last 15 years.

There is even a common name for this problem. It is called the “pesticide treadmill”. It is called a treadmill because once it starts to develop people apply more pesticide which causes more resistance. So more pesticide is applied and even more resistance develops. And that repeats over and over again like being on a treadmill.

A few examples might be useful. In some places in the world mosquitoes that spread malaria are resistant to all pesticides known to control them. Pigweed, the most common weed in cotton fields is resistant to the active ingredient in the herbicide Roundup. In Florida, in 2002 at somewhere between 10 and 50 sites around Florida the hydrilla weed, the weed that infests so many of our lakes, is no longer controlled by the preferred herbicide. This forces use of a more expensive herbicide to control it costing us taxpayers. According to the Herbicide Resistance Action Committee, there are five common weeds in Florida that are resistant to one or more herbicide. The most serious is something called American Black Nightshade which infests somewhere between 1000 and 10,000 acres of tomato fields. Closer to home for most of us, the Chinch Bug, which is the bane of those of us with St Augustine lawns, has become resistant, in some parts of the state, to bifenthrin and its cousins (cyfluthrin, permethrin, imiprothrin, fenpropatrin, lambda-cyhalothrin, fluvalinate and many others), the most commonly used pesticides in our homes today.

Pesticide resistance is one of those problems that people are dealing with. You can help by applying pesticides responsibly. Fortunately, applying pesticides responsibly will also give you the best results in the garden.
- Use mechanical methods such as hand weeding of weeds. For insects pick large ones off with gloves and dump them into a bucket of soapy water. If a swarm of small insects infests one or two branches of a shrub, clip the branch off and throw it away.

- Use natural products such as oils, soaps and other natural pesticides against insects whenever possible.
  - Figure out what your pest is. Look for it under the leaves and in the tender parts (new growth) of the plant. What kind of damage are you seeing: chewing damage; damage from sucking the sap from the plant; leaf discoloration; spots on the leaves; dead or dying branches; leaves curled up at the edges? Each of these symptoms indicates a different kind of insect or maybe not an insect at all. You will not solve a nutrition problem with an insecticide. Using the wrong pesticide will cause harm and no good.

- Only use chemical pesticides as a last resort and then do a spot treatment. Do not spray everything in the area “just in case”. Do not use the same pesticide repeatedly against the same pest.

- Use a pesticide that has your pest on its label. If your pest is not listed, the pesticide will probably not control it.

- Find pest tolerant plants. Insects find the plants they are looking for by smell, sight and touch. If your plants smell or feel wrong, the insects won’t bother them. So choose plants that your major pests don’t like.

- Use beneficial insects to counteract the pests. By planting the right types of plants and not spreading a lot of pesticides around you can encourage the growth of these natural beneficials. Alternatively, you can purchase several different types of beneficial insects over the internet.

- Clean up the accumulation of dead leaves and other debris from under the plants. Many insects use this debris for their young or to hide. Sometimes when planting annuals or vegetables you can plant before or after the pest is most abundant. Older plants can withstand an attack by pests better than younger ones.

- When you mix pesticides, read the label first. Use the rate on the label and apply it to the area indicated on the label. If a label says to use two teaspoons per gallon of water use two teaspoons not one or three. Not only is it better practice, but also it will work better. Be sure to cover all areas of a plant especially under leaves where many insects hide.
Monitor the insect and find out its stage of growth. Many insects are vulnerable as young but invulnerable or less vulnerable as adults. The young may only be around at certain times of the year. Know the enemy.

If you must use chemical pesticides alternate between two or three different classes of pesticide. The class is determined by the method the pesticide uses to kill an insect. You want to alternate between different methods of killing pests so they do not develop pesticide resistance.

An article on Chinch bugs: http://edis.ifas.ufl.edu/pdffiles/LH/LH03600.pdf

List of pesticide resistant weeds: http://www.weedscience.org/In.asp

An interesting article on pesticide resistance from Clemson University; http://ipm.ncsu.edu/safety/factsheets/resistan.pdf