**Biological and Chemical INSECTICIDES\***

(\*from Your Organic Garden with Jeff Cox)

“Biological insecticides kill insect pests without harming the environment. While they may not work as quickly as some chemical sprays and dusts do, they are effective, with virtually no harmful side effects.

**Microbial Insecticides** cause pests to get sick. BT (*Bacillus thuringiensis*) bacteria produce crystals and spores that paralyze the digestive tract of certain insect larvae. BT products are nontoxic to mammals, are specific to the target pest, do not harm beneficial insects, and may be used right up to harvest. (ed. note: BT, under the brand name of Dipel, is available at Jasper Feed & Seed in Ridgeland. I haven’t found it at Lowe’s or Home Depot)

**BT Rule of Thumb**:

When is the best time to apply *Bacillus thuringiensis* to pest-infested plants? Wait until the caterpillars are just big enough to eat a hole through a leaf. If you spray when they’re teeny, they probably won’t eat enough BT to kill themselves. But if they’re able to bite through the leaf, they’re more likely to ingest enough to kill them. Also, you won’t have to be super careful to spray the underside of every single leaf, because the pests will be chewing both sides anyway.

*Nosema locustae* provides long-term control of grasshoppers. About half the grasshoppers that eat the bait containing the organisms will die within three to four weeks. Surviving grasshoppers will infect the following year’s generations.

CHEMICAL INSECTICIDES

“Insecticides kill insects. They’re a quick and seemingly simple solution for pest problems in houses, office buildings, restaurants, farm fields, and backyard gardens. However, organic gardeners prefer to use control techniques that are less toxic and less environmentally damaging whenever possible for managing insect pests. Even botanical poisons – organically acceptable insecticides – pose environmental risks and should be used only when all other control methods fail. If you decide to apply an insecticide, always follow the appropriate safety precautions. (. . .)

The following list is arranged from least to most toxic.

**Pheromones** are hormone-like chemicals produced and emitted by insects to communicate with other members of their species. They are highly specific and can attract insects from great distances, (used to attract and trap pests such as Japanese beetles.)

**Growth Regulators** (IGRs) are chemical mimics of insect hormones that disrupt feeding, development or reproduction of a specific insect, and they present little risk to non-target species. They are currently available for controlling aphids, whiteflies, fleas, and fungus gnats.

**Insecticidal Oils** block the insect’s supply of oxygen and are especially effective because they spread well over surfaces. They break down quickly and are more toxic to pests than to beneficial insects.

**Diatomaceous Earth (DE)** is a nontoxic mineral product mined from fossilized shell remains of an algae known as diatoms. This fine powder has microscopic sharp edges that pierce soft-bodied insects and cause them to dehydrate. Apply natural-grade DE as a dust, preferably after a light rain so that it will stick better. Or to spray DE, mix 1 ounce of DE with ¼ teaspoon liquid soap and add 1 gallon of water. To protect trees and shrubs from caterpillar attack, paint a thicker mix on their trunks.

**Insecticidal Soaps** are specially formulated solutions of fatty acids that kill insect pests such as aphids, mites, and white-flies. Insecticidal soap is a contact insecticide that paralyzes insects, which then die of starvation. (. . . ) Soaps may damage plants if applied too strongly or if plants are drought – or heat – stressed. (. . .) Many organic gardeners use 1 to 3 teaspoons of household soap (not detergent) per gallon of water as a garden insecticide. (Ed. note: try on a leaf or two first and see if the leaf turns yellow before proceeding)

**Sulphur** can be used to control mites and chiggers. Sulfur is gentle on large predator insects but will kill tiny parasitic wasps. (which you don’t want to kill!)

**Neem Oil** is extracted from the neem tree, native to India. (. . .) Neem oil is a broad-spectrum insect poison, repellent, and feeding deterrent. (. . .)Research is ongoing, but neem oil appears to be easy on beneficials and of very low toxicity to mammals.

**Pyrethrins** are derived from the flowers of pyrethrum daisies. (. . .) Pyrethrins are available in many commercial dusts and sprays, some of which also contain soap and/or other natural insecticides. Apply in the early evening.

**Rotenone** is prepared from the roots of various South American legumes and is a nonselective, slow-acting nerve poison that paralyzes insects after they eat it. Use it to control flea beetles, aphids, Colorado potato beetles, cucumber beetles, and whiteflies. Rotenone is highly toxic to fish, burds, and pigs. (. . .) Rotenone is considered relatively nontoxic to humans, but some people are allergic to it. Wear a face mask and rubber gloves when using it and choose a liquid formulation. Avoid using it around lakes and waterways.

**OTHERS:**

**Ryania**

**Sabadilla**

**Nicotine**