Pyrethrum/Pyrethrins and Pyrethroids (including Permethrin) – What You Need to Know

Beyond the botanical pyrethrum (derived from chrysanthemum plants) are a number of derivatives and synthetic products with similar names. In addition to confusion about names, there may also be 1) confusion about the status of these products as "organic" and 2) concerns about the various risks posed to bees and other non-targeted species as well as other environmental issues.

Pyrethrum (active ingredient Pyrethrins)

Pyrethrum is the name of a natural insecticide made from the dried flower heads of certain types of chrysanthemum plants. Pyrethrum, (active ingredient pyrethrins) has been used world-wide for centuries as an insecticide. The active ingredient in pyrethrum are pyrethrin esters. It is fast-acting, kills a variety of insects and mites, has relatively low toxicity to people, and breaks down quickly in the outdoor environment. It is mainly used for indoor pest control.

Unfortunately pyrethrum has always been expensive to produce. Therefore chemists after WW II searched for ways to synthesize pyrethrins (purified pyrethrum). Pyrethrins continue to be a popular insecticide found in over 2,000 registered commercial products (e.g. Raid Flying Insect Killer).

Note for farmers/home gardeners: Because of its short half-life and minimal residual activity when used outdoors, pyrethrins may be applied up to 24 hours before harvesting food crops.

Environmental Impact of Using Pyrethrins

Additives: Pyrethrin is often considered to be organic, but only when it is not combined with piperonyl butoxide or other synthetic additives. Note: piperonyl butoxide is a probable human carcinogen. Take appropriate precautions and as always, read the label!

Bees: **Pyrethrins are toxic to bees**. To minimize risk to bees apply only in the late evening, night or early morning when bees are less active. Liquid formulations of pyrethrum insecticides are usually less hazardous to bees than dusts or granular forms. Pyrethrum dusts can be carried on the bees' hairs back to the hive, where the queen may be affected.

Cats and Dogs: Despite its organic origins, it should be noted that **cats are highly susceptible to poisoning by pyrethrins**. Dogs who accidently consumed pyrethrum exhibited behaviors such as drooling, tremors, uncoordinated movement, difficulty breathing, convulsions and seizers.

Aquatic species: **Pyrethrins are highly toxic to fish and other aquatic organisms**. Do not use near wetlands or water courses.

Birds: Pyrethrins are reported to be practically non-toxic to birds.

Pyrethroids (Includes Permethrin) (cont.)

Pyrethroids, which came on the scene in the 1990s, are a number of synthetically produced versions of the two pyrethrin esters. Pyrethroids have a distinct advantage over pyrethrins in that they have greater stability under sunlight, resulting in longer residual activity.

Many concentrated pyrethroid formulations are restricted to commercial use by licensed applicators. However, low concentration, ready-to-use products are available for homeowner use. For example aerosol products, marketed under the names of Repel or Sawyer among others, are sold to be sprayed on clothing as insect repellents. Also available is a line of clothing which has been treated with permethrin to repel insects including mosquitoes and ticks.

Many of the chemicals used for area-wide tick control are pyrethroids. Check with your applicator.

Remember that pyrethroids are not natural chemicals and should not be used by organic gardeners or farmers who want to maintain their organic status.

How Can I Recognize Pyrethroid Products? Be sure to read the label of any pesticide product. The name of the active ingredient should be clearly listed with both the common name and the chemical name. Common pyrethroid names always end in either *–thrin* or *–ate*. See list below. Different pyrethroids have somewhat different chemical characteristics so check the label for precautions to be taken for your specific product.

The most widely used pyrethroid is ***permethrin***. Others are allethrin, bifenthrin, cyfluthrin, cypermethrin, cyphenothrin, deltamethrin, esfenvalerate, etofenprox, fenpropathrin, fenvalerate, flucythrinate, flumethrin, imiprothrin, lamba-cyhalothrin, metofluthrin, prallethrin, resmethrin, silafluofen, sumithrin, tau-fluvalenate, tefluthrin, tetramethrin, tralomethrin, and transfluthrin.

Environmental Impact for Permethrin include:

Bees and wildlife: **Permethrin, like most pyrethroids, is extremely toxic to bees**. Severe losses may be expected if bees are present at treatment time, or within a day thereafter. It should not be applied or allowed to drift, to crops or weeds in which active foraging takes place.

Aquatic species: **Permethrin is toxic to fish** and should be kept out of all bodies of water. It is listed as a “restricted use” substance by the EPA due to its high toxicity to aquatic organisms.

Cats: Permethrin is also highly toxic to cats. Check labels of flea and tick-repellents.

Children: While no data currently exists for Permethrin, it is generally believed that **children are especially sensitive to all pesticides putting them at higher risk of harmful toxic effects.**

Protect Our Pollinators