

SINCE WHEN ARE ORGANIC PESTICIDES NOT CHEMICALS?

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Pesticides are as old as modern civilizations and were first recorded long before the Renaissance in both the Western and the Oriental worlds. Development of modern pesticide took a quantum leap forwards after the First World War and the developments advanced even faster after the Second World War. There is much to relate about the negative impacts of pesticides on humankind and the environment but information is often unscientific and blatant nonsense. In a rapidly changing world people realize the importance of safer agricultural practices and in particular the more responsible use of pesticides. The question is, however, how do we achieve effective food production while minimizing the impacts of pesticides on the broader environment? The same holds true for the control of garden and household pests.

It has recently become a favourite topic of the environmental lobby to promote the so-called 'organic pesticides' while slating the classic pesticides as environmentally damaging. The word 'organic' is perhaps the most misused and misunderstood word as far as pesticides are concerned and leaves an Organic Chemist with a rather bitter taste on the tongue. *Organic* in scientific terms means a molecule that consists mainly of a carbon skeleton with other elements such as hydrogen, oxygen, nitrogen, sulphur, phosphorus and a few others as contributing building blocks. The majority of modern pesticide molecules is organic and fit in 100% with the scientific classification of organic. The so-called *organic pesticides* should thus definitely be called *natural* as they are also mostly organic (in scientific terms) but are strictly of natural origin. The classic pesticides that are often referred to as chemical pesticides are in fact all chemicals but they are synthetic (such as organophosphates) or semi-synthetic (such as pyrethroids) whereas the natural pesticides are chemicals of a natural origin such as salts of fatty acids and plant oils.

Synthetic pesticides are in most cases highly effective against the pests that they are registered for, have a good residual activity (which means they are active for a certain length of time) and are fairly cheap, depending on where the consumer acquires them from. The dangers of synthetic pesticides lie in their toxicity to life forms and their persistence in the environment. Note that different classes of synthetic pesticides have different toxicities towards different organisms and a highly varying range of persistence in the environment. There is no such thing as an environmentally friendly pesticide; they are designed to kill and that is what they will do in varying degrees of efficacy. As conservationists we should be concerned with biodiversity and that means *all* life forms and not just the birds and mammals. Pyrethroids for example may be quite soft on mammals and birds but this particular group of semi-synthetic pesticides is extremely toxic to insects, fish and amphibians. Some products within the organophosphate and carbamate groups of synthetic pesticides are extremely toxic to basically all forms of life, including human beings. Such products should never be used by the general consumer.

Natural insecticides are popping up all over the market and are often accompanied by extremely risky claims. Labeling such products as 'safe', 'contains no chemicals' and 'harmless to children and pets' are not only highly unethical but also leads the public to seriously misuse such products. As mentioned earlier, all pesticides are chemicals, even the natural ones and if the natural ones were safe, how would they kill the pests? In South Africa no pesticides may be branded as environmentally friendly, not even the naturals. Fatty acids and plant oils such as canola and garlic oils are toxic to the environment because they kill invertebrates and aquatic organisms. If we remove the *goggas* from the cycles of life the entire biological network will fall apart. The advantage of natural pesticides lie in their low toxicity to warm blooded creatures and fairly rapid decomposition; this latter characteristic may be construed to be a disadvantage as there is no or little residual action on their part. If you don't contact the *gogga* directly

with the natural *gif*, then the application is in vain of the objective. Comparing the application rates of natural insecticides with that of synthetic insecticides paints a somewhat ridiculous picture in certain cases. As much as ten times more natural insecticide is required per litre of spray mixture compared to the dosage required for a synthetic pesticide. This is naturally (excuse the pun) more expensive and may be somewhat less attractive to the consumer. I see it as a great disadvantage for the environment and for garden biodiversity to have to apply such a load of even a natural chemical. In most cases the application of natural pesticides is required more frequently than with synthetic pesticides. In many cases the lifespan of natural insecticides has not been assessed properly, so we don't even know how long they remain active in the environment and what their effects may be, yet producers claim rapid breakdown of the products. I cannot imagine that a spider would be happily crawling around on a plant that is covered in a layer of plant oil that is supposedly 'natural'.

All pesticides in South Africa are governed by the Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947). All products that claim to control, kill or repel any vertebrate or invertebrate pest have to be registered with the Registrar of Act No. 36 of 1947 whether such products are natural or synthetic of origin. The Act is highly prescriptive in terms of the registration requirements, claims that are made on the labels of such products and a host of other things. This is to ensure that products are effective, that they do not pose a significant risk to human beings and the environment, and do what they are supposed to do. Pesticide manufacturers are bound by law to print warnings and precautions on their labels but of course we can expect that the public do *not* to read and follow the advice presented on the labels. In the conservation we deal with wildlife, domestic animal and human poisoning on a daily basis and sad to say, virtually all incidents are the result of some end user failing to follow safety precautions and application instructions. Someone who fails to follow the instructions supplied with pesticides cause as much harm with a natural pesticide as with a synthetic pesticide.

The synthetic pesticides sold in the household and garden markets are generally much less toxic than those products supplied to agricultural industry, yet home owners poison themselves, their pets and their garden wildlife by not adhering to instructions. The greatest danger as far as I am concerned lies in people's general perceptions that synthetic pesticides are dangerous and natural insecticides are safe. *There is no safe pesticide!!* People should start having a respect and concern for all life forms and not just for the big and hairy. Have you ever seen how people kill spiders with insecticides while claiming to be environmentally friendly because they use 'organic insecticides'? To me this borders on total lunacy. Spiders come as close to a natural insecticide as you will ever find and should never be killed, irrespective of whether they are poisonous or not. Some synthetic insecticides are extremely toxic and it is justified to be very cautious about such products but from a responsible and environmental point of view, natural insecticides should be used with as great a respect and caution as the synthetics. Or do we not regard the insects that keep our gardens alive as less important than the birds?

By all means people have a right to choose a product that they believe will do the job and be less harmful to the environment, but please base your selection of pesticide on the holistic facts of wildlife and human life and not on some fictitious marketing claims. Don't believe that synthetic pesticides are all bad news. These products have all been tested rigorously and approved by the Department of Agriculture and if used according to the label instructions pose little risk to life. There are organophosphates such as mercaptothion that are soft on warm blooded creatures but there are natural insecticides that will wipe out fish and frogs faster than mercaptothion can hope to achieve.

Don't believe that natural insecticides are the answer to all our problems. Rather use a legally approved synthetic pesticide than some so-called organic pesticide that has never been tested nor approved by Agriculture. This spells danger to some form of life in your garden. There is a good suite of natural insecticides available in South Africa – these products have undergone the same rigorous testing and evaluations as the synthetic pesticides and are registered just like the synthetic pesticides. Should you thus

prefer a natural insecticide choose one that is registered with the Department of Agriculture and follow the instructions on the label as rigorously as you would follow the instructions on a container of oxydemeton-methyl. It is your responsibility to use all pesticides *only* as instructed to get the desired effect, to minimize impacts on the environment and to prevent poisoning yourself. I have never come across a bad pesticide but I have come across thousands of bad pesticide users and for those I wish we could have a system that disallows them the right to use any pesticides of whatever nature.

Some pesticide producers are very concerned about the misuse of their products and offer training to retailers on product safety and responsible use. Sadly, this training stops there as members of the public are hardly ever trained in responsible use. Certain pesticide companies offer telephonic advice to the public as well as training. I manage an information service and it is heartening to see how many people care and call for advice. Those are the ones who should be using pesticides. The rest? Well, I have my doubts even if they use an *organic insecticide*!