

# Just How Toxic are the Chemicals we are Using on Our Courses?

by Dr. Paul Sartoretto

Following is the conclusion of the presentation by Dr. Paul Sartoretto of the W.A. Cleary Chemical Corp. which was made April 9th at Columbia CC. Questions regarding the information can and should be forwarded to Dr. Sartoretto at (201) 247-8000 or through our local contact Don Cherry (804) 740-5656. (A copy of the LD 50 table referred to can also be obtained through these contacts.)

Given the timeliness of the issue, and the impact its resolution will have on our industry, we have a professional obligation to ensure that the facts are known and the myths are put to rest. Given this responsibility, education is essential and Dr. Sartoretto's presentation is offered in that light.

In my speech on how to avoid phytotoxicity, I generalize by saying insolubles cannot burn, but solubles can and you must exercise caution in their use. We have been comparing an insoluble Daconil with a soluble aspirin. Aspirin is a safe soluble, but there are a number of solubles that you use that are not as safe as aspirin but keep in mind the LD<sub>50</sub> of aspirin is a bench mark.

You may have read recently about a fanatic that has been killing a lot of household pets in North Carolina by lacing pet food with the pesticide DISYSTON, an insecticide you don't use but farmers do. The LD<sub>50</sub> of DISYSTON is about 3 mg. per kg. A cat or dog doesn't weigh much more than 3 or 5 kg., so a lethal dose is not much more than 20 mg. which is equivalent of a couple pinches of salt. DISYSTON is a thiophosphate insecticide not much different than the thiophosphate insecticides that you are using, except yours are safer. Oktanol is 10 times safer with an LD<sub>50</sub> of 32; Dursban is about 50 times safer with an LD<sub>50</sub> 135; and Diazinon is 100 times safer with a LD<sub>50</sub> 300. Nevertheless, these are low LD<sub>50</sub> and the concentrates are potentially dangerous. They act on the insects and humans in the same way poisoning the nervous system.

Ironically, Granular Diazinon which is the safest of the three has been suspect for use on golf courses in some areas because of unfortunate misuse. They are usually formulated as emulsifiable concentrates dissolved in an organic solvent with an emulsifiable agent added. These in turn are to be mixed with large volumes of water, sprayed on the golf course with a further recommendation that they be watered in to get to the grubs. The same emulsifiable concentrate can be mixed with a granular carrier such as corn cobs or vermiculite so that they can be applied

with a spreader with further recommendation that they later be washed into the soil with large volumes of water. If the corn cob is laced with Diazinon it becomes a tempting poisonous morsel for a bird. Birds weigh less than a kilogram, so all they have to ingest is about the amount of Diazinon that is equivalent to the amount of a baby aspirin.

Unlike the insolubles, the solubles can be absorbed through the skin. As a rule one need not worry about the diluted spray, but has to exercise caution in handling the concentrates. Wear protective clothing and a respirator when preparing the diluted mixture in the spray tank.

Let's consider a prominent soluble fungicide which has been around for many years and has a startlingly high toxicity. Yet you have used it successfully for a couple of decades without any fear that it could have been hazardous. This product is Actidione TGF — an antibiotic! Antibiotics are safe; haven't we all taken antibiotics, prescribed by doctors? Well, this one has a LD<sub>50</sub> of 2 mg. per kg.! But Upjohn, the manufacturer, did an excellent job of formulating the product so that you received it in a form that was non-poisonous. A product must bear a skull and crossbones label if the formulated material has an LD<sub>50</sub> or under. By diluting Actidione with inert so that you receive a 2% mixture the formulated product then had an LD<sub>50</sub> 100. You, in turn, was asked to dilute the product with water at the rate of 1 oz. per 3 gallons of water. The diluted spray then had an LD<sub>50</sub> 37,500.

This example emphasizes the importance of exercising great care and caution working with the formulated concentrate and at the same time demonstrates the minimal danger of handling the diluted spray. Actidione was taken off the market because EPA challenged the risk factor and Nor-Am made the business decision to drop the product.

Following is a table providing you with LD<sub>50</sub>'s of all the pesticides available to Golf Course Superintendents. This data was taken from W.T. Thomson's Agricultural Chemicals 1985-86 Revision. Bear in mind that the LD<sub>50</sub> refers to the pure active ingredient so that if you want the LD<sub>50</sub> of the formulated product you divide by the percentage of active. For example, Caddy is 20% Cadmium Chloride solution. Since Cadmium Chloride has an LD<sub>50</sub> 88, dividing by 0.2, the LD<sub>50</sub> of Caddy becomes 440.

Nothing in my talk should be interpreted as a suggestion that you can ignore safety in using pesticides. Read and follow the label instructions carefully! Read the

Material Safety Data Sheet carefully! Follow the manufacturers recommendations on personal protection equipment required. It is better to be overly safe than sorry.

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