

## MANCOZEB FACTSHEET

The active ingredient, mancozeb, is a fungicide in a subclass of carbamate pesticides called dithiocarbamates. They have a similar action to carbamate insecticides except they affect the nervous system through their main metabolite, carbon disulfide.

Mancozeb is marketed by the trade names Dithane, Manzeb, Nemispot, and Manzane. It is used to protect many fruit, nut, and field crops from a wide spectrum of fungal diseases.

### Toxicity to Humans

Mancozeb is a cholinesterase inhibitor and can therefore have effects on the nervous system. Symptoms of exposure include fatigue, headache, blurred vision, and nausea. At high doses exposed persons can have convulsions, slurred speech, confusion, and slowed heartbeat. In lower doses, mancozeb can also cause a skin rash if the chemical has contact with the skin. In one study, a vineyard worker developed a rash on the forearm as well as inflammation of the eyelids after handling seedlings, which had been treated with mancozeb.<sup>1</sup>

A major toxicological concern with respect to mancozeb and other dithiocarbamates is its primary metabolite, ethylenethiourea (ETU), shown to cause thyroid and carcinogenic effects in test animals. Mancozeb is listed as a chemical known by the State of California to cause cancer in humans. Many studies dating back to 1980 show that mancozeb can cross the placental barrier and induce or increase tumor incidence. A recent study shows that mancozeb and its metabolites are capable of crossing the placental barrier and can produce DNA damage and initiate tumors in fetal cells.<sup>2</sup>

### Risks to the Environment

Mancozeb, if applied to soil, will have a low mobility based on its high adsorption coefficient. If it is released into water, it will tend to adsorb to sediment and suspended solids. It has low soil persistence with a reported half-life of 1-7 days. Again, the primary concern with mancozeb is its spontaneous degradation to ethylenethiourea (ETU) in the presence of water and oxygen. ETU has a persistence of 5-10 weeks. While mancozeb is practically insoluble in water making it unlikely to contaminate groundwater, its metabolite, ETU, has the potential to be mobile in soils.

### Physicochemical Properties

$\log K_{ow} = 1.33$

$K_{oc} = 1000$

Water solubility = 6.2 mg/L

$LC_{50} = 2.2$

$LD_{50} = > 5000$  mg/kg

Half Life = 1-7 days

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<sup>1</sup> Hayes, W.J., Jr., E.R. Laws, Jr., (eds.). Handbook of Pesticide Toxicology. Volume 3. Classes of Pesticides. New York, NY: Academic Press, Inc., 1991. 1451

<sup>2</sup> Shukla, Y. & A. Arora. Transplacental carcinogenic potential of the carbamate fungicide mancozeb. Environ Pathol Toxicol Oncol. 2001;20(2):127-31.