

HERBICIDES COMMONLY USED ON SCHOOL GROUNDS

In point form:

- Glyphosate has been described as “extremely persistent” (NCAP 2000:2, citing US EPA 1993-2), even though it has been promoted as an environmentally friendly herbicide that rapidly breaks down. However, tests show that glyphosate may persist for 3 years (NCAP 2000:2, citing Torstensson et al. 1989), while its metabolite, AMPA, may persist even longer (Ewing 1999:11, citing World Health Organization 1994). Glyphosate has been shown to cause genetic mutations in human, animal and plant cell tests (NCAP 2000:2, citing Vigfusson 1980; Kale et al. 1995; Rank et al. 1993).
- Oryzalin (active ingredient of Surflan) is persistent and carcinogenic (NCAP 2000:2, citing US EPA 1994).
- Dichlobenil (active ingredient of Casoron) is persistent (NCAP 2000:2, citing Williams & Eagle 1979), causes cancer in animals and is classified by EPA as a possible human carcinogen (NCAP 2000:2, citing US EPA 1999-1).
- Glyphosate has been associated with a number of health and ecological problems (Cox 1993:4). The surfactants added to glyphosate are acutely toxic to humans and aquatic animals, can cause damage to the digestive system and lungs, and may be the cause of death in exposed humans (Cox 1993:4, citing Sawada, et al. 1988; Tominack 1991; Talbot 1991).
- Glyphosate ingestion has affected the pituitary gland and kidneys, and caused abnormal bone development and decreased birth weights in laboratory animals (Cox 1993:4, citing US EPA 1986).
- And, though the US EPA classified glyphosate as Group E, Evidence of Noncarcinogenicity in Humans, Monsanto’s own data submitted to EPA in support of this classification showed otherwise, note:
 - * increase in pancreatic tumors at 2 doses in female rats;
 - * significant increase in liver tumors with increasing dose;

* significant increase in thyroid tumors with increased dose in female rats (Cox 1993:4, citing Dykstra & Ghali 1991).

MISDIAGNOSIS AND SUSCEPTIBILITY TO CHEMICAL HARM

Two significant problems exist with regard to herbicide or pesticide poisoning:

1. Pesticide poisoning is extremely problematic because mild to moderate pesticide poisoning symptoms can be easily misdiagnosed as stomach-flu, bronchitis or asthma (Reeves, Schafer, Hallward & Katten 1999:17). My concern here is that some instances of flu and other outbreaks at local schools can be directly attributed to the spraying of chemicals, and are not simply issues of the regular childhood contagions we expect to see every year. Blood tests can confirm the presence or absence of toxins. They are a valuable medical avenue through which a situation can be clarified.

Even severe pesticide poisoning in infants has been misdiagnosed as aneurysm, head trauma, diabetic acidosis, severe bacterial gastroenteritis, pneumonia and whooping cough (Reeves, Schafer, Hallward & Katten 1999:17, citing Solomon & Mott 1998; Zweinerd & Ginsburg 1988).



2. Children are much more susceptible to poisoning than adults for a number of reasons:

- * They inhale a greater volume of air in relation to their body weight than adults, and so receive a larger dose (NCAP 2000:12-14, citing NRC 1993).
- * They have a greater skin surface area proportional to body mass. This means that equivalent exposures in an adult and child results in a greater dose for the child (NCAP 2000:12-14, citing NRC 1993).
- * They play nearest the sites of application (NCAP 2000:13).
- * They display hand-to-mouth behavior (NCAP 2000:12,14).
- * Children's nervous systems are more susceptible to the impact of nerve poisons (NCAP 2000:12,14:4, citing NRC 1993; Watanabe 1990).
- * Children cannot effectively detoxify certain chemicals (compared to adults) and so are much more vulnerable to poisoning (NCAP 2000:12,14, citing NRC 1993).
- * The dividing cells in children's bodies are more susceptible to the impact of cancer-causing chemicals (NCAP 2000:12,14, citing NRC 1993).
- * Their immune systems, being underdeveloped, are more prone to damage from exposure to foreign compounds (NCAP 2000:12,14, citing Repetto & Baliga 1996; NRC 1993).

And also, in point form, regarding commonly used pesticides such as organophosphates (OPs):

- Organophosphate (OP) insecticides can be inhaled, whereupon they are rapidly absorbed (NCAP 2000:11).
- OPs are neurotoxicants, and are known to inhibit the enzyme acetylcholinesterase (Environmental Protection Agency 1995:26938).
- Human and experimental animal evidence exists "indicating that there may be residual, if not permanent, effects of exposure" (Environmental Protection Agency 1995, citing: Steenland et al. 1994; Tandon et al. 1994; Stephens et al. 1995).
- OP pesticides have been implicated in bone abnormalities in fish (Ewing 1999:35).
- The OP poisoning of children (including ingestion *and* inhalation of the chemicals) has resulted in the generation of numerous symptoms and events including slowed

heart rate, pulmonary edema (where some of the children required ventilators for several hours), death from parathion poisoning, stupor, coma, hypotonicity¹ and muscle weakness, and some muscarinic² symptoms (Pesticide Action Network 1999:2, citing Lifshitz et al. 1999:102-103).

- The OP poisoning of farm families (not themselves occupationally exposed, but merely living with farmers who used OPs) in agricultural communities in rural El Salvador presented symptoms such as limb cramps, chest pressure, changes in defecation, feeling dazed and increased lacrimation – all acute health effects produced in individuals not involved in field work themselves (Pesticide Action Network 1999:4, citing Azaroff & Neas 1999:158-164)).



- Home fumigation with OPs has produced acute and reversible parkinsonism (symptoms of Parkinson's Disease, or a syndrome resembling Parkinson's) (Pesticide Action Network 1999:4, citing Bhatt et al. 1999:1467-1471).
- Animal study evidence suggests that OP pesticide exposure can lead to neurodevelopmental effects such as reduced balance, increasing righting reflex time, and diminished cliff avoidance (Pesticide Action Network 2000:2, citing Eskenazi et al. 1999:409-416).
- Occupational exposure to OPs in China resulted in increases to rates of sperm aneuploidy (Pesticide Action Network 2000:4, citing Padungtod et al. 1999:230-238).
- **OP pesticides** (eg oxydemeton-methyl, methyl parathion and methamidophos) are **"responsible for most of the occupational deaths and poisonings in the U.S. and throughout the world"** (Reeves, et al. 1999:18, citing Blondell & Dobozy 1997; Keifer & Mahurin 1997; Moses et al. 1993, Savage et al. 1988).

¹ *Hypotonia*: Loss of muscular tonicity, relaxation of the arteries (Stedman's Medical Dictionary 1976:683).

² *Muscarinic*: Cardiac inhibition, vasodilation, salivation, lacrimation, bronchoconstriction, gastrointestinal stimulation (Stedman's Medical Dictionary 1976:893).

The above information demonstrates clearly that the Roundup or glyphosate herbicide is extremely toxic. Pesticides are also chemicals that need to be restricted far more than they generally are. This well researched and catalogued American data alone warrants a careful review of all pesticides and herbicides used in Australian schools.

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