

Hazard to children:
cancer; potential for
immune, endocrine and
developmental effects



Pesticide Action Network Asia and the Pacific

P.O. Box 1170
10850 Penang, Malaysia
Tel: (604) 657 0271 / 656
0381
Fax: (604) 658 3960
Email: panap@panap.net
Homepage:
www.panap.net

Copyright ©Pesticide
Action Network Asia
and the Pacific. All
rights reserved.

Pesticide Action Network Asia
and the Pacific (PAN AP)
encourages the reproduction
and use of this publication as
long as PAN AP is properly
acknowledged as the source
and provided with

Meriel Watts, PhD
June 2014

A PANAP Factsheet Series **Highly Hazardous** **Pesticides** **Chlorothalonil**

Uses: broad spectrum fungicide; contaminated by hexachlorobenzene.

Bans: Denmark,
Sweden

Residues: in cord blood,
newborn's blood;¹ food,
drinking water.²

Acute toxicity: low
acute toxicity, but
corrosive in eyes. Signs
include diarrhoea,
lacrimation, laboured
breathing, reduced
muscle tone, irritation of
skin and mucous
membranes of eye and
respiratory tract; asthma
symptoms have been
reported.^{2 3} Diabetic
ketoacidosis has been
reported following high
occupational exposure.⁴
Associated with
occupational poisoning
in Tanzania.⁵

Chronic toxicity
Kidney damage.²

Cancer: US EPA
probable human
carcinogen based on
rodent kidney and
stomach tumours; HCB
also a probable human
carcinogen.² Three-fold
increased risk of
multiple myeloma in one
study of users;⁶ and
increased risk of non-
Hodgkin's lymphoma in
another.⁷

Genotoxicity: DNA
damage in leukocytes of

exposed farmers;⁸
metabolite is mutagenic
in mammalian cells.²

Endocrine disruption:
nonmonotonic effects on
corticosterone in
amphibia.⁹

Reproduction:
maternal exposure in
rats interfered with
physical and
maturational
development landmarks
of offspring, showing
subtle effects on
behavioural and
physical development.¹⁰

Immune: immunotoxic
in trout¹¹ and amphibia.⁹

Environmental effects:
Aquatic: very highly
toxic to aquatic
organisms; also affects
their reproduction; fish
kills reported.²

Terrestrial: metabolite
has reproductive effects
on birds.² Residues in
honey bee hives (wax
and pollen);¹² toxic to
bee larvae.¹³

Environmental fate:
may be persistent in
aquatic environments,
and soil.² Found in
surface and ground
waters,² air, rain,¹⁴
Arctic.¹⁵ Some concern
about bioconcentration,
especially in oysters.²

References:

- ¹ Watts MA. 2013. *Poisoning Our Future: Children and Pesticides*. Pesticide Action Network Asia & the Pacific, Penang.
- ² US EPA. 1999. Reregistration Eligibility Decision for Chlorothalonil.
- ³ US EPA. Recognition and Management of Pesticide Poisonings. Sixth Edition. US Environmental Protection Agency.
- ⁴ Fernández-García JC, Arrebola JP, González-Romero S, Soriguer F, Olea N, Tinahones FJ. 2014. Diabetic ketoacidosis following chlorothalonil poisoning. *Occup Environ Med* 71:382.
- ⁵ Lekei E, Ngowi AV, London L. 2014. Farmers' knowledge, practices and injuries associated with pesticide exposure in rural farming villages in Tanzania. *BMC Public Health* 14:389.
- ⁶ Landgren O, Kyle RA, Hoppin JA, Beane Freeman LE, Cerhan JR, Katzmann JA, Rajkumar SV, Alavanja MC. 2009. Pesticide exposure and risk of monoclonal gammopathy of undetermined significance in the Agricultural Health Study. *Blood* 113(25):6386-91.
- ⁷ Schinasi L, Leon ME. 2014. Non-Hodgkin lymphoma and occupational exposure to agricultural pesticide chemical groups and active ingredients: a systematic review and meta-analysis. *Int J Environ Res Public Health* 11(4):4449-527.
- ⁸ Lebailly P, Vigreux C, Lechevrel C, Ledemenev D, Godard T, Sichel F, LeTalaër JY, Henry-Amar M, Gauduchon P. 1998. DNA damage in mononuclear leukocytes of farmers measured using the alkaline comet assay: modifications of DNA damage levels after a one-day field spraying period with selected pesticides. *Cancer Epidemiol Biomarkers Prev* 7(10):929-40.
- ⁹ McMahon TA, Halstead NT, Johnson S, Raffel TR, Romansic JM, Crumrine PW, Boughton RK, Martin LB, Rohr JR. 2011. The fungicide chlorothalonil is nonlinearly associated with corticosterone levels, immunity, and mortality in amphibians. *Environ Health Perspect* 119(8):1098-103.
- ¹⁰ de Castro VL, Chiorato SH, Pinto NF. 2000. Biological monitoring of embryo-fetal exposure to methamidophos or chlorothalonil on rat development. *Vet Hum Toxicol* 42(6):361-5.
- ¹¹ Shelley LK, Balfry SK, Ross PS, Kennedy CJ. 2009. Immunotoxicological effects of a sub-chronic exposure to selected current-use pesticides in rainbow trout (*Oncorhynchus mykiss*). *Aquat Toxicol* 92(2):95-103.
- ¹² Mullin CA, Frazier M, Frazier JL, Ashcraft S, Simonds R, Vanengelsdorp D, Pettis JS. 2010. High levels of miticides and agrochemicals in North American apiaries: implications for honey bee health. *PLoS One* 5(3):e9754.
- ¹³ Zhu W, Schmehl DR, Mullin CA, Frazier JL. 2014. Four common pesticides, their mixtures and a formulation solvent in the hive environment have high oral toxicity to honey bee larvae. *PLoS One* 9(1):e77547.
- ¹⁴ Kurt-Karakus PB1, Teixeira C, Small J, Muir D, Bidleman TF. 2011. Current-use pesticides in inland lake waters, precipitation, and air from Ontario, Canada. *Environ Toxicol Chem* 30(7):1539-48.
- ¹⁵ Hoferkamp L, Hermanson MH, Muir DC. 2010. Current use pesticides in Arctic media; 2000-2007. *Sci Total Environ* 408(15):2985-94.