

Chemical Factsheet

Pyrethrins

General Information

- Fact Sheet: [Synthetic.Pyrethroids.Factsheet.pdf](#)
- Product Names:
 - Raid House & Garden Bug Killer** (SC Johnson), formulated with [Piperonyl butoxide](#), Isobutane, Propane
 - Hot Shot Kitchen Bug Killer 2** (Spectrum Brands), formulated with [Piperonyl butoxide](#), Isobutane
 - Raid Flea Killer Plus** (SC Johnson), formulated with [Piperonyl butoxide](#), Isobutane, N-Octyl bicycloheptene dicarboximide (MGK 264), [Tetramethrin](#), Propane
 - Pyrenone** (Bayer Environmental Science), formulated with [Piperonyl butoxide](#)
 - Hartz 2 in 1 Flea + Tick Killer** (Hartz Mountain), formulated with [Piperonyl butoxide](#), N-Octyl bicycloheptene dicarboximide
- Chemical Class: Pyrethrin insecticide
- Uses: Pre-harvest and postharvest uses on many agricultural crops; livestock animals and premises; commercial and industrial facilities and storage areas where raw and processed food/feed commodities are stored or processed; wide area mosquito abatement use in areas which include aquatic areas; and residential settings. Targets many different types of insects and arthropods including ants, worms, beetles, mites, flies, gnats, spiders, weevils, caterpillars, grubs, moths, ticks, lice, wasps, aphids, midges etc.
- Alternatives: [Organic Agriculture](#), [Least-toxic mosquito control](#)
- Beyond Pesticides rating: [Toxic](#)

Health and Environmental Effects

See citations at end of document.

- Cancer: Likely (1)
- Endocrine Disruption: Not documented
- Reproductive Effects: Likely (2)
- Neurotoxicity: Not documented
- Kidney/Liver Damage: Not documented
- Sensitizer/ Irritant: Yes (3)
- Birth/Developmental: Not documented
- Detected in Groundwater: Not documented
- Potential Leacher: Not documented
- Toxic to Birds: Not documented
- Toxic to Fish/Aquatic Organisms: Yes (4)
- Toxic to Bees: Yes (5)

Residential Uses as Found in the ManageSafe™ Database

- [Ants](#)
- [Bed Bugs](#)
- [Carpenter Ants](#)

- [Cockroaches](#)
- [Fleas](#)
- [Head Lice](#)
- [Spiders](#)
- [Carpenter Bees](#)
- [Chiggers](#)
- [Mosquitoes](#)
- [Wasps and Yellowjackets](#)
- [Bagworms](#)
- [Carpet Beetle](#)
- [Centipedes](#)
- [Ticks](#)
- [Aphids](#)

Additional Information

- Regulatory Status:
 - [EPA Reregistration Eligibility Decision \(RED\) signed](#) (6/2006)
 - Beyond Pesticides' Pyrethrins RED [comments](#).
- Supporting information:
 - [Asthma, Children and Pesticides](#) (Beyond Pesticides)
 - [NCAP Pyrethrins Factsheet](#) (Northwest Coalition for Alternatives to Pesticides)
 - [Exttoxnet Pyrethrins Factsheet](#) (Extension Toxicology Network)
 - [PAN Pesticides Database:Pyrethrins](#) (Pesticide Action Network)
 - [Scorecard Pyrethrins Factsheet](#) (The Pollution Information Site)
- Studies [compiled from the [Pesticide-Induced Diseases Database](#)]
 - [Acute Illnesses Associated With Pesticide Exposure at Schools](#), Alarcon, W. et. al. 2005. *Journal of the American Medical Association*. 294 (4):455-465
 - [A Longitudinal Approach to Assessing Urban and Suburban Children's Exposure to Pyrethroid Pesticides](#). Lu C, Barr DB, Pearson M, Bartell S, Bravo R.. 2006. *Environ Health Perspect*. 114(9):1419-23.
 - [A mode of action for induction of thyroid gland tumors by Pyrethrins in the rat.](#) Finch JM, Osimitz TG, Gabriel KL, et al. 2006. *Toxicol Appl Pharmacol*.214(3):253-62
 - [Fatal asthma in a child after use of an animal shampoo containing pyrethrin](#). Wagner, SL. 2000. *West J Med* 173: 86-87
 - [Oxidative stress of glyphosate, AMPA and metabolites of pyrethroids and chlorpyrifos pesticides among primary school children in Cyprus](#). Makris, K.C., Efthymiou, N., Konstantinou, C., Anastasi, E., Schoeters, G., Kolossa-Gehring, M. and Katsonouri, A., *Environmental Research*, 212, p.113316.
 - [Effects of prenatal and infant daily exposure to pyrethroid pesticides on the language development of 2-year-old toddlers: A prospective cohort study in rural Yunnan, China](#). Chen, S., Xiao, X., Qi, Z., Chen, L., Chen, Y., Xu, L., Zhang, L., Song, X. and Li, Y. *NeuroToxicology*.
 - [Gut microbiota dysbiosis involves in host non-alcoholic fatty liver disease upon pyrethroid pesticide exposure](#). Li, M., Liu, T., Yang, T., Zhu, J., Zhou, Y., Wang, M. and Wang, Q., 2022.*Environmental Science and Ecotechnology*, 11, p.100185.
 - [Exploratory analysis of the association between pyrethroid exposure and rheumatoid arthritis among US adults: 2007-2014 data analysis from the National Health and Nutrition Examination Survey \(NHANES\)](#). Guo, X., Li, N., Wang, H., Su, W., Song, Q., Liang, Q., Sun, C., Liang, M., Ding, X., Lowe, S. and Sun, Y., 2022. *Environmental Science and Pollution Research*, pp.1-11.

- [Developmental pyrethroid exposure causes a neurodevelopmental disorder phenotype in mice.](#) Curtis, M.A., Dhamsania, R.K., Branco, R.C., Guo, J.D., Creeden, J., Neifer, K.L., Black, C.A., Winokur, E.J., Andari, E., Dias, B.G. and Liu, R.C., 2023. PNAS nexus, 2(4), p.pgad085.

Gateway Health and Environmental Effects Citations

1. EPA weight-of-evidence category, "Likely to be carcinogenic to humans." US EPA, 2005. Office of Pesticide Programs. List of Chemicals Evaluated for Carcinogenic Potential. May 10, 2005. <http://www.fluoridealert.org/wp-content/pesticides/pesticides.cancer.potential.2006.pdf>
2. Hu, Y., Zhang, Y., Vinturache, A., Wang, Y., Shi, R., Chen, L., Qin, K., Tian, Y. and Gao, Y., 2020. Effects of environmental pyrethroids exposure on semen quality in reproductive-age men in Shanghai, China. Chemosphere, 245, p.125580. <https://doi.org/10.1016/j.chemosphere.2019.125580>
3. Extension Toxicology Network (EXTOXNET) Pesticide Information Profiles. <http://extoxnet.orst.edu/pips/ghindex.html>
4. US EPA, Office of Prevention, Pesticides and Toxic Substances, Reregistration Eligibility Decisions (REDs), Interim REDs (iREDs) and RED Factsheets. <https://archive.epa.gov/pesticides/reregistration/web/html/status.html>.
5. Yueh, MF et al. 2014. [The commonly used antimicrobial additive triclosan is a liver tumor promoter.](#) PNAS doi: 10.1073/pnas.1419119111. *Triclosan promotes liver cancer cell development and proliferation in mice through pathways common to humans.*

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