Chemical Factsheet

Abamectin/Avermectin B1

General Information

- Fact Sheet: Abamectin.pdf
- Product Names:
  Avid (Valent)
  Agrimek (Syngenta)
  Vertimek (Syngenta)
  Zephyr (Novartis Crop Protection)
  Prevamite (Chemtura) formulated with Bifenazate
- Chemical Class: Macrocyclic lactone compounds
- Uses: Insecticide, miticide, nematicide for use on various agrucultural uses: fruits, vegetables, legumes, herbs, cotton, tree nuts; and non-agricultural uses: forestry, ornamentals, lawns, turf, transportation facilities, food/feed processing,distribution facilities, dairy cattle,
- Alternatives: Organic Agriculture
- Beyond Pesticides rating: Toxic

Health and Environmental Effects

See citations at end of document.

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

Residential Uses as Found in the ManageSafe™ Database

- Ants
- Tree-boring Caterpillars
- Cockroaches

Additional Information

- Regulatory Status:
  - EPA Registration Documents
  - Ecological Risk Assessment (2010)
- Supporting information:

    - Extoxnet Abamectin Factsheet (Extension Toxicology Network)
    - PAN Pesticides Database: Abamectin (Pesticide Action Network)
- Studies [compiled from the Pesticide-Induced Diseases Database]
    - Immune response of Brazilian farmers exposed to multiple pesticides . Jacobsen-Pereira, C.H. et al. (2020) 'Immune response of Brazilian farmers exposed to multiple pesticides', Ecotoxicology and Environmental Safety, 202, p. 110912. doi:10.1016/j.ecoenv.2020.110912.
    - A Th2-type immune response and low-grade systemic inflammatory reaction as potential immunotoxic effects in intensive agriculture farmers exposed to pesticides . Lozano-Paniagua, D. et al. (2024) 'A th2-type immune response and low-grade systemic inflammatory reaction as potential immunotoxic effects in intensive agriculture farmers exposed to pesticides', Science of The Total Environment, 938, p. 173545. doi:10.1016/j.scitotenv.2024.173545.
    - Transport mechanisms of pesticide mixtures impairing intestinal barrier function in mice. Liu, Z. et al. (2025) Transport mechanisms of pesticide mixtures impairing intestinal barrier function in mice, Pesticide Biochemistry and Physiology. Available at: https://www.sciencedirect.com/science/article/abs/pii/S0048357525000690.
    - ROS generation and DNA damage contribute to abamectin-induced cytotoxicity in mouse macrophage cells. Liang, Y., Dong, B., Pang, N., & Hu, J. (2019). ROS generation and DNA damage contribute to abamectin-induced cytotoxicity in mouse macrophage cells. Chemosphere, 234, 328–337. https://doi.org/10.1016/j.chemosphere.2019.06.031
    - Assessment of genetic damage levels in agricultural workers exposed to pesticides in Paraíba, Brazil. Carvalho-Gonçalves, L. et al. (2025) Assessment of genetic damage levels in agricultural workers exposed to pesticides in Paraíba, Brazil, Environmental Toxicology and Pharmacology. Available at: https://www.sciencedirect.com/science/article/abs/pii/S1382668925000900.
    - Assessment of Avermectins-Induced Toxicity in Animals. Salman, Muhammad, Rao Zahid Abbas, Khalid Mehmood, Riaz Hussain, Sehar Shah, Mehwish Faheem, Tean Zaheer, Asghar Abbas, Bernardo Morales, Ina Aneva, and et al. 2022. "Assessment of Avermectins-Induced Toxicity in Animals" Pharmaceuticals 15, no. 3: 332. https://doi.org/10.3390/ph15030332
    - The effect of abamectin exposure on gametogenesis in zebrafish. Bağdatli, S., Yön Ertuğ, N.D. The effect of abamectin exposure on gametogenesis in zebrafish. Sci Rep 15, 9038 (2025). https://doi.org/10.1038/s41598-025-93638-6
    - Effects of Avermectins on the Environment Based on Its Toxicity to Plants and Soil Invertebrates—a Review. de Souza, R.B., Guimarães, J.R. Effects of Avermectins on the Environment Based on Its Toxicity to Plants and Soil Invertebrates—a Review. Water Air Soil Pollut 233, 259 (2022). https://doi.org/10.1007/s11270-022-05744-0
    - Negative effects of abamectin on soil microbial communities in the short term. Qiu D, Xu N, Zhang Q, Zhou W, Wang Y, Zhang Z, Yu Y, Lu T, Sun L, Zhou N-Y, Peijnenburg WJGM and Qian H (2022) Negative effects of abamectin on soil microbial communities in the short term. Front. Microbiol. 13:1053153. doi: 10.3389/fmicb.2022.1053153
    - Forecasting of Dangerous Influence of Avermectin Insecticides to Human Organism Using Surface and Groundwater for Drinking. Antonenko, Anna & Vavrinevych, O. & Shpak, Bohdan & Omelchuk, Sergii. (2021). Forecasting of Dangerous Influence of Avermectin Insecticides to Human Organism Using Surface and Groundwater for Drinking. Environmental Research, Engineering and Management. 77. 59-66. 10.5755/j01.erem.77.1.23706.
    - Abamectin causes cardiac dysfunction in carp via inhibiting redox equilibrium and resulting in immune inflammatory response and programmed cell death. Zhao, P., Wang, Y., Yang, Q. et al. Abamectin causes cardiac dysfunction in carp via inhibiting redox

equilibrium and resulting in immune inflammatory response and programmed cell death. Environ Sci Pollut Res 30, 29494–29509 (2023). https://doi.org/10.1007/s11356-022-24004-6
- Abamectin promotes behavior changes and liver injury in zebrafish. Santos, Keiza Priscila Enes Dos et al. “Abamectin promotes behavior changes and liver injury in zebrafish.” Chemosphere vol. 311,Pt 1 (2023): 136941. doi:10.1016/j.chemosphere.2022.136941
- Avermectin induces carp neurotoxicity by mediating blood-brain barrier dysfunction, oxidative stress, inflammation, and apoptosis through PI3K/Akt and NF-κB pathways. Zhang, Tianmeng et al. “Avermectin induces carp neurotoxicity by mediating blood-brain barrier dysfunction, oxidative stress, inflammation, and apoptosis through PI3K/Akt and NF-κB pathways.” Ecotoxicology and environmental safety vol. 243 (2022): 113961. doi:10.1016/j.ecoenv.2022.113961

Gateway Health and Environmental Effects Citations

1. Extension Toxicology Network (EXTOXNET) Pesticide Information Profiles. http://extoxnet.orst.edu/pips/ghindex.html

2. National Library of Medicine. PubChem Hazardous Substances Database. PubChem (nih.gov)

3. US EPA, 2000. Table 1: Toxicity Data by Category for Chemicals Listed under EPCRA Section 313. Toxic Release Inventory (TRI) Program. https://www.epa.gov/sites/production/files/documents/hazard_categories.pdf

4. California Environmental Protection Agency. Proposition 65: Chemicals Known to the State to Cause Cancer or Reproductive Toxicity. Office of Environmental Health Hazard Assessment. February 25, 2022.https://oehha.ca.gov/media/downloads/proposition-65//p65chemicalslistsinglelisttable2021p.pdf

5. 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.

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