

Chemical Factsheet

Metolachlor

General Information

- Product Names:
 - Dual Magnum** (Syngenta)
 - Pennant Magnum** (Syngenta)
 - Boundary** (Syngenta) formulated with [Metribuzin](#)
 - Camix** (Syngenta) formulated with [Mestorione](#)
 - Lumax** (Syngenta) formulated with [Atrazine](#), and [Mesotrione](#)
 - Sequence** (Syngenta) formulated with [Glyphosate](#)
 - Prefix** (Syngenta) formulated with [Fomesafen Sodium](#)
 - Cinch** (Du Pont)
 - Charger** (Winfield)
- Chemical Class: Chloroacetanilide herbicide
- Uses: Control of grass and grasslike weeds and broadleaf weeds on terrestrial food crops: cabbage, pepper, radish and stone fruits; terrestrial food and feed crops: corn, cotton, legume vegetables, peanuts, peas, potato, safflower, sorghum, soybeans, treenuts, alfalfa (feed only); terrestrial non-food crops and outdoor residential: Rights-of-Way, golf courses, recreational areas and lawns, nonbearing fruits, ornamental and/or shade trees, ornamental plants and flowers, residential lawns; forest trees.
- Alternatives: [Organic agriculture](#)
- Beyond Pesticides rating: [Toxic](#)

Health and Environmental Effects

See citations at end of document.

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

Additional Information

- Regulatory Status:
 - [EPA Reregistration Eligibility Decision](#) (RED) signed (4/1995)
 - [Beyond Pesticides' Tolerance Comments \(April 2026\)](#)
- Supporting information:

- [Extoxnet Metolachlor Factsheet](#) (Extension Toxicology Network)
- [PAN Pesticide Database – Metolachlor](#) (Pesticide Action Network)
- Studies [compiled from the [Pesticide-Induced Diseases Database](#)]
 - [Assessment of genetic effects and pesticide exposure of farmers in NW Greece](#). Moshou, H., Karakitsou, A., Yfanti, F., Hela, D., Vlastos, D., Paschalidou, A.K., Kassomenos, P. and Petrou, I., 2020. Environmental Research, p.109558.
 - [Cancer incidence among pesticide applicators exposed to metolachlor in the Agricultural Health Study](#). Rusiecki, J.A., et al. 2006. Int J Cancer 118(12):3118-3123.
 - [Direct pesticide exposure of insects in nature conservation areas in Germany](#). Brühl, C.A., Bakanov, N., Köthe, S., Eichler, L., Sorg, M., Hörren, T., Mühlethaler, R., Meinel, G. and Lehmann, G.U. Scientific reports, 11(1), pp.1-10.
 - [Exposure to pesticides, persistent and non – persistent pollutants in French 3.5-year-old children: Findings from comprehensive hair analysis in the ELFE national birth cohort](#). Macheka, L. et al. (2024) Exposure to pesticides, persistent and non – persistent pollutants in French 3.5-year-old children: Findings from comprehensive hair analysis in the ELFE national birth cohort, Environment International. Available at: <https://www.sciencedirect.com/science/article/pii/S0160412024004677>.
 - [Estimating the aquatic risk from exposure to up to twenty-two pesticide active ingredients in waterways discharging to the Great Barrier Reef](#). Warne, M. et al. (2023) Estimating the aquatic risk from exposure to up to twenty-two pesticide active ingredients in waterways discharging to the Great Barrier Reef, Science of The Total Environment. Available at: <https://www.sciencedirect.com/science/article/pii/S0048969723032552>.
 - [The influence of polyethylene microplastics on pesticide residue and degradation in the aquatic environment](#). Wang, F., Gao, J., Zhai, W., Liu, D., Zhou, Z., & Wang, P. (2020). The influence of polyethylene microplastics on pesticide residue and degradation in the aquatic environment. Journal of hazardous materials, 394, 122517. <https://doi.org/10.1016/j.jhazmat.2020.122517>
 - [A cocktail of contaminants: how mixtures of pesticides at low concentrations affect aquatic communities](#). Relyea R. A. (2009). A cocktail of contaminants: how mixtures of pesticides at low concentrations affect aquatic communities. Oecologia, 159(2), 363–376. <https://doi.org/10.1007/s00442-008-1213-9>
 - [Currently used and legacy pesticides in the marine atmosphere from Patagonia to Europe](#). Debler, F., Gandrass, J., Paul Ramacher, M. O., Koenig, A. M., Zimmermann, S., & Joerss, H. (2025). Currently used and legacy pesticides in the marine atmosphere from Patagonia to Europe. Environmental pollution (Barking, Essex : 1987), 373, 126175. Advance online publication. <https://doi.org/10.1016/j.envpol.2025.126175>
 - [Wastewater surveillance for assessing human exposure to pesticides: Investigating populations living near flower bulb fields](#). Bijlsma, L. et al. (2025) Wastewater surveillance for assessing human exposure to pesticides: Investigating populations living near flower bulb fields, Journal of Environmental Chemical Engineering. Available at: <https://www.sciencedirect.com/science/article/pii/S2213343725017865>.
 - [Bioaccumulation, metabolism and endocrine-reproductive effects of metolachlor and its S-enantiomer in adult zebrafish \(Danio rerio\)](#). Ou-Yang, K., Feng, T., Han, Y., Li, G., Li, J., & Ma, H. (2022). Bioaccumulation, metabolism and endocrine-reproductive effects of metolachlor and its S-enantiomer in adult zebrafish (Danio rerio). The Science of the total environment, 802, 149826. <https://doi.org/10.1016/j.scitotenv.2021.149826>
 - [Occurrence of Current-Use Pesticides in Paired Indoor Dust, Drinking Water, and Urine Samples from the United States: Risk Prioritization and Health Implications](#). Xie, Y., Li, J., Salamova, A., & Zheng, G. (2025). Occurrence of Current-Use Pesticides in Paired Indoor Dust, Drinking Water, and Urine Samples from the United States: Risk Prioritization and Health Implications. Environmental science & technology, 59(25), 12507–12519.

<https://doi.org/10.1021/acs.est.5c00961>

- [Acute and Subchronic Exposure of the Common Carp \(*Cyprinus carpio*\) to Herbicide S-Metolachlor](#). Rašković, Božidar, Vesna Poleksić, Gorica Vuković, Bojana Špirović Trifunović, Gavriilo Božić, Dejana Čupić Miladinović, Zoran Marković, and Dragica Brkić. 2023. "Acute and Subchronic Exposure of the Common Carp (*Cyprinus carpio*) to Herbicide S-Metolachlor" *Water* 15, no. 23: 4182. <https://doi.org/10.3390/w15234182>
- [Pesticides and Pesticide Degradates in Groundwater Used for Public Supply across the United States: Occurrence and Human-Health Context](#). Bexfield, Laura M et al. "Pesticides and Pesticide Degradates in Groundwater Used for Public Supply across the United States: Occurrence and Human-Health Context." *Environmental science & technology* vol. 55,1 (2021): 362-372. doi:10.1021/acs.est.0c05793
- [Incident thyroid disease in female spouses of private pesticide applicators](#). Shrestha, S., Parks, C. G., Goldner, W. S., Kamel, F., Umbach, D. M., Ward, M. H., Lerro, C. C., Koutros, S., Hofmann, J. N., Beane Freeman, L. E., & Sandler, D. P. (2018). Incident thyroid disease in female spouses of private pesticide applicators. *Environment international*, 118, 282-292. <https://doi.org/10.1016/j.envint.2018.05.041>
- [Pesticide transformation products: a potential new source of interest for drinking water](#). Pasquini, L., Lardy-Fontan, S. and Rosin, C. (2025) Pesticide transformation products: a potential new source of interest for drinking water, *Environmental Science and Pollution Research*. Available at: <https://link.springer.com/article/10.1007/s11356-025-35979-3>.
- [Pesticide Prioritization by Potential Biological Effects in Tributaries of the Laurentian Great Lakes](#). Oliver, S.K., Corsi, S.R., Baldwin, A.K., Nott, M.A., Ankley, G.T., Blackwell, B.R., Villeneuve, D.L., Hladik, M.L., Kolpin, D.W., Loken, L., DeCicco, L.A., Meyer, M.T. and Loftin, K.A. (2023), Pesticide Prioritization by Potential Biological Effects in Tributaries of the Laurentian Great Lakes. *Environ Toxicol Chem*, 42: 367-384. <https://doi.org/10.1002/etc.5522>
- [Flood Frequency and Duration Drive the Aquatic-Terrestrial Pesticide Transfer to Riparian Root-Zone Soil: A Mesocosm Study](#). Fiolka, F. et al. (2026) Flood Frequency and Duration Drive the Aquatic-Terrestrial Pesticide Transfer to Riparian Root-Zone Soil: A Mesocosm Study, *Archives of Environmental Contamination and Toxicology*. Available at: <https://link.springer.com/article/10.1007/s00244-026-01190-9>.
- [Pesticides in ambient air, influenced by surrounding land use and weather, pose a potential threat to biodiversity and humans](#). Zaller, J. G., Kruse-Platz, M., Schlechtriemen, U., Gruber, E., Peer, M., Nadeem, I., Formayer, H., Hutter, H. P., & Landler, L. (2022). Pesticides in ambient air, influenced by surrounding land use and weather, pose a potential threat to biodiversity and humans. *The Science of the total environment*, 838(Pt 2), 156012. <https://doi.org/10.1016/j.scitotenv.2022.156012>

Gateway Health and Environmental Effects Citations

1. 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>.
2. Pesticide Action Network Pesticide Database. http://www.pesticideinfo.org/Search_Chemicals.jsp.
3. Extension Toxicology Network (EXTOXNET) Pesticide Information Profiles. <http://extoxnet.orst.edu/pips/ghindex.html>
4. U.S. Geological Survey, Pesticides in the Nation's Streams and Ground Water, 1992-2001. <http://water.usgs.gov/nawqa/pnsp/pubs/circ1291/appendix7>.

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