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
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    - 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
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- 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-Plaß, 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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