

Chemical Factsheet

Acetamiprid

General Information

- Product Names:
 - Assail** (Nippon)
 - Intruder** (Nippon)
 - Tristar** (Nippon)
- Chemical Class: Neonicotinoid Insecticide
- Uses: Agriculture, Lawns/broadleaf plants
- Alternatives: [Organic agriculture](#), [Organic lawn care](#)
- Beyond Pesticides rating: [Toxic](#)

Health and Environmental Effects

See citations at end of document.

- Cancer: Insufficient Studies
- Endocrine Disruption: Possible (1)
- Reproductive Effects: Possible (2, 1)
- Neurotoxicity: Yes (3, 4, 5)
- Kidney/Liver Damage: Yes (6, 7, 8)
- Sensitizer/ Irritant: No (9)
- Birth/Developmental: Possible (2, 9)
- Detected in Groundwater: Possible (10)
- Potential Leacher: Possible (9, 11)
- Toxic to Birds: Likely (9)
- Toxic to Fish/Aquatic Organisms: Yes (12)
- Toxic to Bees: Yes (13)

Residential Uses as Found in the ManageSafe™ Database

- [Ants](#)
- [Cockroaches](#)
- [Bed Bugs](#)
- [Termites](#)

Additional Information

- Regulatory Status:
 - [EPA Factsheet](#) (3/2002)
 - [Beyond Pesticides Comments](#) (September 2025)
- Supporting information:
 - [PAN Pesticides Database](#): (Pesticide Action Network)
- Studies [compiled from the [Pesticide-Induced Diseases Database](#)]
 - [Low concentration acetamiprid-induced oxidative stress hinders the growth and development of silkworm posterior silk glands](#). Lu, Z., Ye, W., Feng, P., Dai, M., Bian, D.,

Ren, Y., Zhu, Q., Mao, T., Su, W., Li, F. and Sun, H., 2021. *Pesticide Biochemistry and Physiology*, 174, p.104824.

- [Effects of neonicotinoid pesticide exposure on human health: a systematic review](#). Cimino AM, Boyles AL, Thayer KA, Perry MJ. 2017. *Environ Health Perspect*. 125:155-162
- [Genotoxic effects of a particular mixture of acetamiprid and \$\alpha\$ -cypermethrin on chromosome aberration, sister chromatid exchange, and micronucleus formation in human peripheral blood lymphocytes](#). Kocaman, A.Y. and Topaktaş, M., 2010. *Environmental Toxicology: An International Journal*, 25(2), pp.157-168.
- [Two cases of acute poisoning with acetamiprid in humans](#). Imamura, T., Yanagawa, Y., Nishikawa, K., Matsumoto, N. and Sakamoto, T., 2010. *Clinical toxicology*, 48(8), pp.851-853.
- [Effects of acetamiprid on immune system in female Wistar rats](#). Mondal, S., Ghosh, R.C., Mate, M.S. and Karmakar, D.B., 2009. In *Proceedings of the Zoological Society* (Vol. 62, No. 2, pp. 109-117). Springer-Verlag.
- [In vitro evaluation of the genotoxicity of acetamiprid in human peripheral blood lymphocytes](#). Kocaman, A.Y. and Topaktaş, M., 2007. *Environmental and Molecular Mutagenesis*, 48(6), pp.483-490.
- [Neonicotinoid insecticides promote breast cancer progression via G protein-coupled estrogen receptor: In vivo, in vitro and in silico studies](#). Li, X., He, S., Xiao, H., He, T.T., Zhang, J.D., Luo, Z.R., Ma, J.Z., Yin, Y.L., Luo, L. and Cao, L.Y., 2022. *Environment International*, 170, p.107568.
- [Infantile Internal and External Exposure to Neonicotinoid Insecticides: A Comparison of Levels across Various Sources](#). Zhang, H., Wang, Y., Zhu, H., Lu, S., Wang, Y., Xue, J., Zhang, T., Kannan, K. and Sun, H., 2023. *Environmental Science & Technology*, 57(13), pp.5358-5367.
- [Major Pesticides Are More Toxic to Human Cells Than Their Declared Active Principles](#). Mesnage, R. et al. (2014) Major pesticides are more toxic to human cells than their declared active principles, *BioMed Research International*. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3955666/>.
- [The molecular determinants of pesticide sensitivity in bee pollinators](#). Bass, C. et al (2024) The molecular determinants of pesticide sensitivity in bee pollinators, *Science of The Total Environment*. Available at: <https://www.sciencedirect.com/science/article/pii/S0048969724003097>.
- [Neonicotinoid pesticides: evidence of developmental neurotoxicity from regulatory rodent studies](#). Sass, J.B., Donley, N. and Freese, W. (2024) Neonicotinoid pesticides: evidence of developmental neurotoxicity from regulatory rodent studies, *Frontiers in Toxicology*. Available at: <https://www.frontiersin.org/journals/toxicology/articles/10.3389/ftox.2024.1438890/full>.
- [Nationwide Biomonitoring of Neonicotinoid Insecticides in Breast Milk and Health Risk Assessment to Nursing Infants in the Chinese Population](#). Chen, D. et al. (2020) Nationwide Biomonitoring of Neonicotinoid Insecticides in Breast Milk and Health Risk Assessment to Nursing Infants in the Chinese Population, *Journal of Agricultural and Food Chemistry*. Available at: <https://pubs.acs.org/doi/10.1021/acs.jafc.0c05769>.
- [Impact of Endocrine Disrupting Pesticide Use on Obesity: A Systematic Review](#). Pérez-Bermejo, M. et al. (2024) Impact of Endocrine Disrupting Pesticide Use on Obesity: A Systematic Review, *Biomedicines*. Available at: <https://www.mdpi.com/2227-9059/12/12/2677>.
- [Widespread Use and Frequent Detection of Neonicotinoid Insecticides in Wetlands of Canada's Prairie Pothole Region](#). Main, A.R. et al. (2014) Widespread Use and Frequent Detection of Neonicotinoid Insecticides in Wetlands of Canada's Prairie Pothole Region, *PLOS ONE*. Available at:

<https://journals.plos.org/plosone/article?id=10.1371%2Fjournal.pone.0092821>.

- [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.
- [Pesticide-Induced Inflammation at a Glance](#). Lopes-Ferreira, M. et al. (2023) 'Pesticide-induced inflammation at a glance', *Toxics*, 11(11), p. 896. doi:10.3390/toxics11110896.
- [Residues and Bioavailability of Neonicotinoid Pesticide in Shaanxi Agricultural Soil](#). Hua, L., Zhao, D., Wang, H. et al. Residues and Bioavailability of Neonicotinoid Pesticide in Shaanxi Agricultural Soil. *Water Air Soil Pollut* 234, 129 (2023). <https://doi.org/10.1007/s11270-023-06159-1>
- [Adverse Effects of Pesticides on the Ovary: Evidence from Epidemiological and Toxicological Studies](#). Wang, L., Ma, X. and Liu, J. (2025) Adverse Effects of Pesticides on the Ovary: Evidence from Epidemiological and Toxicological Studies, *Environment & Health*. Available at: <https://pubs.acs.org/doi/full/10.1021/envhealth.4c00243>.
- [The effects analysis of two neonicotinoid insecticides on in vitro maturation of porcine oocytes using hanging drop monoculture method](#). Ishikawa, S., Hiraga, K., Hiradate, Y., & Tanemura, K. (2015). The effects analysis of two neonicotinoid insecticides on in vitro maturation of porcine oocytes using hanging drop monoculture method. *The Journal of veterinary medical science*, 77(6), 725–728. <https://doi.org/10.1292/jvms.15-0008>
- [Neonicotinoid insecticides can pose a severe threat to grassland plant bug communities](#). Sedlmeier, J.E. et al. (2025) Neonicotinoid insecticides can pose a severe threat to grassland plant bug communities, *Communications Earth & Environment*. Available at: <https://www.nature.com/articles/s43247-025-02065-y>.
- [Chronic oral exposure to field-realistic pesticide combinations via pollen and nectar: effects on feeding and thermal performance in a solitary bee](#). Azpiazu, C., Bosch, J., Viñuela, E. et al. Chronic oral exposure to field-realistic pesticide combinations via pollen and nectar: effects on feeding and thermal performance in a solitary bee. *Sci Rep* 9, 13770 (2019). <https://doi.org/10.1038/s41598-019-50255-4>
- [Exposure to sublethal levels of insecticide-fungicide mixtures affect reproductive success and population growth rates in the solitary bee *Osmia cornuta*](#). Albacete, S., Sancho, G., Azpiazu, C., Sgolastra, F., Rodrigo, A., & Bosch, J. (2024). Exposure to sublethal levels of insecticide-fungicide mixtures affect reproductive success and population growth rates in the solitary bee *Osmia cornuta*. *Environment international*, 190, 108919. <https://doi.org/10.1016/j.envint.2024.108919>
- [Acute toxicity of 6 neonicotinoid insecticides to freshwater invertebrates](#). Raby, M., Nowierski, M., Perlov, D., Zhao, X., Hao, C., Poirier, D. G., & Sibley, P. K. (2018). Acute toxicity of 6 neonicotinoid insecticides to freshwater invertebrates. *Environmental toxicology and chemistry*, 37(5), 1430–1445. <https://doi.org/10.1002/etc.4088>
- [Single and joint toxicity assessment of acetamiprid and thiamethoxam neonicotinoids pesticides on biochemical indices and antioxidant enzyme activities of a freshwater fish *Catla catla*](#). Veedu, S. K., Ayyasamy, G., Tamilselvan, H., & Ramesh, M. (2022). Single and joint toxicity assessment of acetamiprid and thiamethoxam neonicotinoids pesticides on biochemical indices and antioxidant enzyme activities of a freshwater fish *Catla catla*. *Comparative biochemistry and physiology. Toxicology & pharmacology : CBP*, 257, 109336. <https://doi.org/10.1016/j.cbpc.2022.109336>
- [The Effect of Neonicotinoids Exposure on *Oreochromis niloticus* Histopathological Alterations and Genotoxicity](#). El-Garawani, I.M., Khallaf, E.A., Alne-na-ei, A.A. et al. The Effect of Neonicotinoids Exposure on *Oreochromis niloticus* Histopathological Alterations

and Genotoxicity. *Bull Environ Contam Toxicol* 109, 1001–1009 (2022).

<https://doi.org/10.1007/s00128-022-03611-6>

- [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>
- [Milkweed in agricultural field margins - A neonicotinoid exposure route for pollinators at multiple life stages](#). Naujokaitis-Lewis, I., Endicott, S., Gaudreault, E., Maisonneuve, F., & Robinson, S. A. (2024). Milkweed in agricultural field margins - A neonicotinoid exposure route for pollinators at multiple life stages. *The Science of the total environment*, 951, 175622. <https://doi.org/10.1016/j.scitotenv.2024.175622>
- [Urinary pesticide biomarkers from adolescence to young adulthood in an agricultural setting in Ecuador: Study of secondary exposure to pesticides among children, adolescents, and adults \(ESPINA\) 2016 and 2022 examination data](#). Parajuli, R. et al. (2025) Urinary pesticide biomarkers from adolescence to young adulthood in an agricultural setting in Ecuador: Study of secondary exposure to pesticides among children, adolescents, and adults (ESPINA) 2016 and 2022 examination data, *Data in Brief*. Available at: <https://www.sciencedirect.com/science/article/pii/S2352340925006067>.
- [Pesticides residues and metabolites in honeybees: A Greek overview exploring Varroa and Nosema potential synergies](#). Kasiotis, Konstantinos M et al. “Pesticides residues and metabolites in honeybees: A Greek overview exploring Varroa and Nosema potential synergies.” *The Science of the total environment* vol. 769 (2021): 145213. doi:10.1016/j.scitotenv.2021.145213
- [Interaction of acetamiprid, Varroa destructor, and Nosema ceranae in honey bees](#). Kang, Yuxin et al. “Interaction of acetamiprid, Varroa destructor, and Nosema ceranae in honey bees.” *Journal of hazardous materials* vol. 471 (2024): 134380. doi:10.1016/j.jhazmat.2024.134380
- [Sub-lethal effects of six neonicotinoids on avoidance behavior and reproduction of earthworms \(Eisenia fetida\)](#). Ge, Jing et al. “Sub-lethal effects of six neonicotinoids on avoidance behavior and reproduction of earthworms (Eisenia fetida).” *Ecotoxicology and environmental safety* vol. 162 (2018): 423-429. doi:10.1016/j.ecoenv.2018.06.064
- [Reproductive risk of Neonicotinoids: A review of male rodent studies](#). Irfan, S. et al. (2025) *Reproductive Risk of Neonicotinoids: A Review of Male Rodent Studies*, *Environmental Research*. Available at: <https://www.sciencedirect.com/science/article/pii/S0013935125021553>.
- [Neonicotinoid insecticide metabolites in seminal plasma: Associations with semen quality](#). Wang, A., Wan, Y., Zhou, L., Xia, W., Guo, Y., Mahai, G., Yang, Z., Xu, S., & Zhang, R. (2022). Neonicotinoid insecticide metabolites in seminal plasma: Associations with semen quality. *The Science of the total environment*, 811, 151407. <https://doi.org/10.1016/j.scitotenv.2021.151407>
- [Characteristics of Exposure of Reproductive-Age Farmworkers in Chiang Mai Province, Thailand, to Organophosphate and Neonicotinoid Insecticides: A Pilot Study](#). Suwannarin, N., Prapamontol, T., Isobe, T., Nishihama, Y., & Nakayama, S. F. (2020). Characteristics of Exposure of Reproductive-Age Farmworkers in Chiang Mai Province, Thailand, to Organophosphate and Neonicotinoid Insecticides: A Pilot Study. *International Journal of Environmental Research and Public Health*, 17(21), 7871. <https://doi.org/10.3390/ijerph17217871>
- [Transcriptome analysis reveals the molecular mechanisms of neonicotinoid acetamiprid in](#)

- [Leydig cells](#). Liu X, Wang C, Ma Y, et al. Transcriptome analysis reveals the molecular mechanisms of neonicotinoid acetamiprid in Leydig cells. *Toxicology and Industrial Health*. 2024;41(2):61-72. doi:10.1177/07482337241300215
- [Reproductive effects of subchronic exposure to acetamiprid in male rats](#). Arıcan, E.Y., Gökçeoğlu Kayalı, D., Ulus Karaca, B. et al. Reproductive effects of subchronic exposure to acetamiprid in male rats. *Sci Rep* 10, 8985 (2020). <https://doi.org/10.1038/s41598-020-65887-0>
 - [Mechanisms and histopathological impacts of acetamiprid and azoxystrobin in male rats](#). EL-Hak, H.N.G., Al-Eisa, R.A., Ryad, L. et al. Mechanisms and histopathological impacts of acetamiprid and azoxystrobin in male rats. *Environ Sci Pollut Res* 29, 43114–43125 (2022). <https://doi.org/10.1007/s11356-021-18331-3>
 - [Effect of acetamiprid on the immature murine testes](#). Terayama, H., Qu, N., Endo, H., Ito, M., Tsukamoto, H., Umemoto, K., ... Sakabe, K. (2018). Effect of acetamiprid on the immature murine testes. *International Journal of Environmental Health Research*, 28(6), 683–696. <https://doi.org/10.1080/09603123.2018.1504897>
 - [Honey bee hives as biomonitors of pesticide environmental pollution. The INSIGNIA-EU monitoring action](#). Fernández-Alba, A. et al. (2025) Honey bee hives as biomonitors of pesticide environmental pollution. The INSIGNIA-EU monitoring action, *Science of The Total Environment*. Available at: <https://www.sciencedirect.com/science/article/pii/S0048969725019254>.
 - [Neonicotinoid insecticides triggers mitochondrial bioenergetic dysfunction via manipulating ROS-calcium influx pathway in the liver](#). Li, S., Cao, Y., Pan, Q., Xiao, Y., Wang, Y., Wang, X., Li, X., Li, Q., Tang, X., & Ran, B. (2021). Neonicotinoid insecticides triggers mitochondrial bioenergetic dysfunction via manipulating ROS-calcium influx pathway in the liver. *Ecotoxicology and environmental safety*, 224, 112690. <https://doi.org/10.1016/j.ecoenv.2021.112690>
 - [Human biomonitoring of urinary neonicotinoids and their metabolites by ultra-high performance liquid chromatography tandem with mass spectrometry and their association with oxidative stress](#). Deng, F., Jia, X., Peng, R., Yuan, J., Pan, X., Li, J., & Tan, L. (2025). Human biomonitoring of urinary neonicotinoids and their metabolites by ultra-high performance liquid chromatography tandem with mass spectrometry and their association with oxidative stress. *Journal of pharmaceutical and biomedical analysis*, 265, 117019. <https://doi.org/10.1016/j.jpba.2025.117019>
 - [A worldwide survey of neonicotinoids in honey](#). Mitchell, E. A. D., Mulhauser, B., Mulot, M., Mutabazi, A., Glauser, G., & Aebi, A. (2017). A worldwide survey of neonicotinoids in honey. *Science (New York, N.Y.)*, 358(6359), 109–111. <https://doi.org/10.1126/science.aan3684>
 - [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>.
 - [High temporal resolution pollen analysis: New insights into current-use pesticides distribution in agricultural landscapes](#). Cirelli, S. et al. (2026) High temporal resolution pollen analysis: New insights into current-use pesticides distribution in agricultural landscapes, *Environmental Pollution*. Available at: <https://www.sciencedirect.com/science/article/pii/S0269749126007189>.

Gateway Health and Environmental Effects Citations

1. Zhang, J.J., Yi, W.A.N.G., Xiang, H.Y., Li, M.X., Li, W.H., WANG, X.Z. and ZHANG, J.H., 2011. Oxidative stress: role in acetamiprid-induced impairment of the male mice reproductive system. *Agricultural sciences in China*, 10(5), pp.786-796. [https://doi.org/10.1016/S1671-2927\(11\)60063-1](https://doi.org/10.1016/S1671-2927(11)60063-1)
2. Sano, K., Isobe, T., Yang, J., Win-Shwe, T.T., Yoshikane, M., Nakayama, S.F., Kawashima, T., Suzuki, G., Hashimoto, S., Nohara, K. and Tohyama, C., 2016. In utero and lactational exposure to acetamiprid induces abnormalities in socio-sexual and anxiety-related behaviors of male mice. *Frontiers in neuroscience*, 10, p.228. <https://www.frontiersin.org/articles/10.3389/fnins.2016.00228/full>
3. Insecticide Resistance Action Committee (IRAC) eClassification of Chemical Mode of Action <http://www.irc-online.org/eClassification/>
4. EFSA Panel on Plant Protection Products and their Residues (PPR), 2013. Scientific Opinion on the developmental neurotoxicity potential of acetamiprid and imidacloprid. *EFSA Journal*, 11(12), p.3471. <https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2013.3471>
5. Gasmi, S., Kebieche, M., Rouabhi, R., Touahria, C., Lahouel, A., Lakroun, Z., Henine, S. and Soulimani, R., 2017. Alteration of membrane integrity and respiratory function of brain mitochondria in the rats chronically exposed to a low dose of acetamiprid. *Environmental science and pollution research*, 24(28), pp.22258-22264. <https://www.researchgate.net/profile/Salim-Gasmi/publication/319051533>
6. Yi-Wang, J.J.Z., Xiang, H.Y., Jia-Hua, Z. and Wang, X.Z., 2012. Acetamiprid residues in male mice and its effect on liver function. *Journal of Animal and Veterinary Advances*, 11(15), pp.2706-2710. <https://www.researchgate.net/profile/Jiao-Jiao-Zhang-2/publication/321824514>
7. Mondal, S., Ghosh, R.C., Karnam, S.S. and Purohit, K., 2014. Toxicopathological changes on Wistar rat after multiple exposures to acetamiprid. *Veterinary World*, 7(12). <https://www.researchgate.net/profile/Samiran-Mondal-3/publication/286174358>
8. Karaca, B.U., Arican, Y.E., Boran, T., Binay, S., Okyar, A., Kaptan, E. and Özhan, G., 2019. Toxic effects of subchronic oral acetamiprid exposure in rats. *Toxicology and industrial health*, 35(11-12), pp.679-687. <https://journals.sagepub.com/doi/abs/10.1177/0748233719893203?journalCode=tiha>
9. Thurston County Health Department. 2014. Olympia, Washington. Thurston County Review Summary: Acetamiprid https://www.co.thurston.wa.us/health/ehipm/pdf_insect/insecticide%20actives/acetamiprid.pdf
10. Carbo, L., Martins, E.L., Dores, E.F., Spadotto, C.A., Weber, O.L. and De-Lamonica-Freire, E.M., 2007. Acetamiprid, carbendazim, diuron and thiamethoxam sorption in two Brazilian tropical soils. *Journal of Environmental Science and Health, Part B*, 42(5), pp.499-507. <https://pubmed.ncbi.nlm.nih.gov/17562457/>
11. Singh, T.B., Mukhopadhyay, S.K., Sar, T.K. and Ganguly, S., 2012. Induced acetamiprid toxicity in mice: a review. *J Drug Metab Toxicol*, 3(6). <https://www.longdom.org/open-access/induced-acetamiprid-toxicity-in-mice-a-review-2157-7609.1000e115.pdf>
12. Ma, X., Li, H., Xiong, J., Mehler, W.T. and You, J., 2019. Developmental toxicity of a neonicotinoid insecticide, acetamiprid to zebrafish embryos. *Journal of agricultural and food chemistry*, 67(9), pp.2429-2436. <https://pubs.acs.org/doi/abs/10.1021/acs.jafc.8b05373>

13. U.S. EPA, Office of Prevention, Pesticides and Toxic Substances, New Active Ingredients Factsheets:

<http://web.archive.org/web/20120107215849/http://www.epa.gov/opprd001/factsheets/index.htm>

Factsheet generated on June 2, 2026