

# Chemical Factsheet

## Dinotefuran

### General Information

- Product Names:
  - Sagcity** (PBI/Gordon)
  - Scorpion** (Gowan)
  - Safari** (Valent)
  - Sarkle** (Mitsui)
  - PT Alpine** (BASF)
- Chemical Class: Neonicotinoid insecticide
- Uses: Agriculture, lawns/golf course
- Alternatives: [Organic agriculture](#), [lawns/landscapes](#), [golf course](#)
- Beyond Pesticides rating: [Toxic](#)

### Health and Environmental Effects

*See citations at end of document.*

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

### Residential Uses as Found in the ManageSafe™ Database

- [Fleas](#)
- [Hemlock Woolly Adelgid](#)
- [Tree-boring Caterpillars](#)
- [Emerald Ash Borer](#)
- [Thrips](#)

### Additional Information

- Regulatory Status:
  - [Dinotefuran Registration Review](#) (2017)
  - [EPA Dinotefuran Petition and Response](#)
  - [Beyond Pesticides' Preliminary Neonicotinoid Assessments \(non-pollinator\) comments](#) (04/2018)

- [EPA Factsheet](#) (9/2004)
- Supporting information:
  - [Pesticides and Pollinators: Chemicals Implicated in CCD](#)
  - [Poisoned Waterways](#) (Beyond Pesticides, 2017)
  - [Net Loss—Economic Efficacy And Costs Of Neonicotinoid Insecticides Used As Seed Coatings: Updates From The United States And Europe](#) (Center for Food Safety, 2016)
  - [Heavy Costs: Weighing the Value of Neonicotinoid Insecticides in Agriculture](#) (Center for Food Safety, 2014)
  - The Xerces Society - [Neonicotinoids and Bees](#)
  - [Forest Service Human Health and Ecological Risk Assessment](#) (04/2009)
- Studies [compiled from the [Pesticide-Induced Diseases Database](#)]
  - [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
  - [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.
  - [Neonicotinoids: Still present in farmland birds despite their ban.](#) Fuentes, E., Gaffard, A., Rodrigues, A., Millet, M., Bretagnolle, V., Moreau, J. and Monceau, K., 2023. *Chemosphere*, 321, p.138091.
  - [Prevalence of neonicotinoid insecticides in paired private-well tap water and human urine samples in a region of intense agriculture overlying vulnerable aquifers in eastern Iowa.](#) Thompson, D.A., Kolpin, D.W., Hladik, M.L., Lehmler, H.J., Meppelink, S.M., Poch, M.C., Vargo, J.D., Soupene, V.A., Irfan, N.M., Robinson, M. and Kannan, K., 2023. *Chemosphere*, 319, p.137904.
  - [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.
  - [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>
  - [Exposure to neonicotinoid pesticides induces physiological disorders and affects color performance and foraging behavior in goldfish.](#) Kakuta, I., & Takase, K. (2024). Exposure to neonicotinoid pesticides induces physiological disorders and affects color performance and foraging behavior in goldfish. *Physiological Reports*, 12, e16138. <https://doi.org/10.14814/phy2.16138>
  - [Effect of Pesticides on Adult Rove Beetle \*Atheta coriaria\* \(Coleoptera: Staphylinidae\) Survival in Growing Medium.](#) Raymond A. Cloyd, Nicholas R. Timmons, Jessica M. Goebel, Kenneth E. Kemp, Effect of Pesticides on Adult Rove Beetle *Atheta coriaria* (Coleoptera: Staphylinidae) Survival in Growing Medium, *Journal of Economic Entomology*, Volume 102, Issue 5, 1 October 2009, Pages 1750–1758, <https://doi.org/10.1603/029.102.0504>
  - [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>
  - [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
- [Neonicotinoid pesticides dinotefuran increase honeybee body temperature and accelerate honeybee \(\*Apis mellifera\*\) translocation of contaminants into hives to enhance ecotoxicity risk](#). Zhang, F. et al. (2025) Neonicotinoid pesticides dinotefuran increase honeybee body temperature and accelerate honeybee (*Apis mellifera*) translocation of contaminants into hives to enhance ecotoxicity risk, *Environmental Chemistry and Ecotoxicology*. Available at: <https://www.sciencedirect.com/science/article/pii/S2590182625002590>.
  - [Ecological toxicity reduction of dinotefuran to honeybee: New perspective from an enantiomeric level](#). Chen, Z., Yao, X., Dong, F., Duan, H., Shao, X., Chen, X., Yang, T., Wang, G. and Zheng, Y., 2019. Ecological toxicity reduction of dinotefuran to honeybee: New perspective from an enantiomeric level. *Environment International*, 130, p.104854. doi: 10.1016/j.envint.2019.05.048.
  - [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>

## Gateway Health and Environmental Effects Citations

1. 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>
2. USDA/Forest Service. Dinotefuran: Human Health and Ecological Risk Assessment Final Report. April 24, 2009. [http://www.fs.fed.us/foresthealth/pesticide/pdfs/0521803b\\_Dinotefuran.pdf](http://www.fs.fed.us/foresthealth/pesticide/pdfs/0521803b_Dinotefuran.pdf).

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