# 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 Neonicotioid 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.

Factsheet generated on June 16, 2026