

# Proposed Groundwater Standards

Wis. Admin. Code NR 140  
Cycle 10



## Neonicotinoids (Clothianidin, Imidacloprid, Thiamethoxam)

### What are these substances used for?

Neonicotinoid insecticides are:

- Widely used around the world and in Wisconsin.
- Safer alternatives to more toxic insecticides in the organochlorine, organophosphate, and carbamate classes. The compounds clothianidin, imidacloprid, and thiamethoxam are highly water soluble compounds that are frequently detected in groundwater.
- Readily absorbed by plant roots where they are then transported throughout plant tissues to provide long lasting systemic activity to all parts of the plant.
- More toxic to insects than animals. They bind strongly to receptors in the central nervous system of insects, causing paralysis and death at high concentrations.

### How do these substances get into the groundwater?

Neonicotinoid compounds have chemical characteristics resulting in the migration from soil with precipitation and irrigation water. They degrade slowly once below the soil surface and away from air and sun. Their slow degradation rates and high solubility allow these compounds to leach through soil to groundwater and to migrate away from application sites. These compounds have been detected most frequently in sandy agricultural areas where groundwater is relatively shallow (less than 20 feet), like in the Central Sands region<sup>1</sup> of the state. In the Central Sands region, they have been detected in surface water samples year round, indicating groundwater with neonicotinoid compounds may also be discharging to streams. Use on crops under irrigation appears to increase the likelihood these compounds may migrate to groundwater.

### Where can I find more information?

- Information about this and other neonicotinoid insecticides:  
<https://datcp.wi.gov/Documents/NeonicotinoidReport.pdf>
- Clothianidin fact sheet  
<https://datcp.wi.gov/Documents/ClothianidinCycle10.pdf>
- Imidacloprid fact sheet  
<https://datcp.wi.gov/Documents/ImidaclopridCycle10.pdf>
- Thiamethoxam fact sheet  
<https://datcp.wi.gov/Documents/ThiamethoxamCycle10.pdf>
- Health-based standards:  
<https://www.dhs.wisconsin.gov/water/gws.htm>
- NR 140 rule process:  
<https://dnr.wi.gov/topic/Groundwater/NR140.html>

### Who do I contact for questions?

DATCP Groundwater Specialist  
(608) 224-4503  
[datcpgw@wisconsin.gov](mailto:datcpgw@wisconsin.gov)

*This fact sheet provides general information. Wisconsin law (Wis. Stat. § 160) provides the process for establishing state groundwater standards in the event no federal standard already exists.*

<sup>1</sup>The Central Sands region lies east of the Wisconsin River and encompasses 1.75 million acres in parts of Adams, Marathon, Marquette, Portage, Shawano, Waupaca, Waushara, and Wood counties.

