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Tracking Fungicides in Streams:
Insights from 15 Years of Swedish Pesticide Monitoring

The data shown here cover 2009–2023 from four small monitored stream catchments.

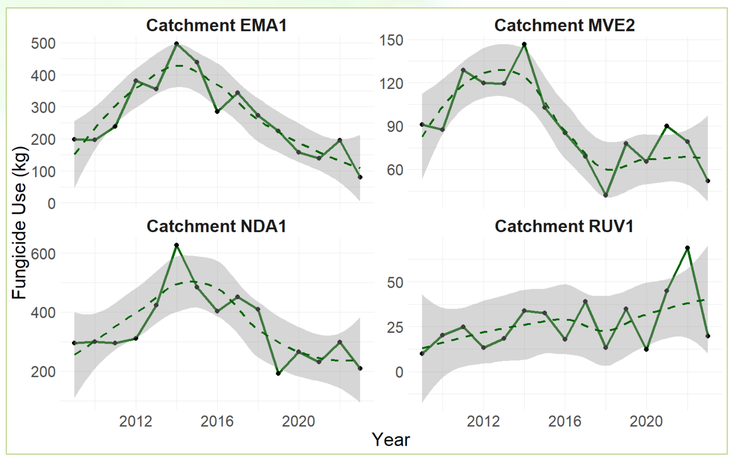
Weekly time integrated surface water monitoring. Concentration of 35 fungicides were monitored.

CONCLUSION

- **Swedish Water Quality Objectives (WQO) were frequently exceeded for three fungicides.**
- **Pyraclostrobin, Picoxystrobin, Cyprondinil and Azoxystrobin posed the highest risk.**

Background

Aquatic ecosystems in agricultural landscapes face chemical stress from pesticide pollution. Fungicides are frequently detected in surface waters throughout the growing season.

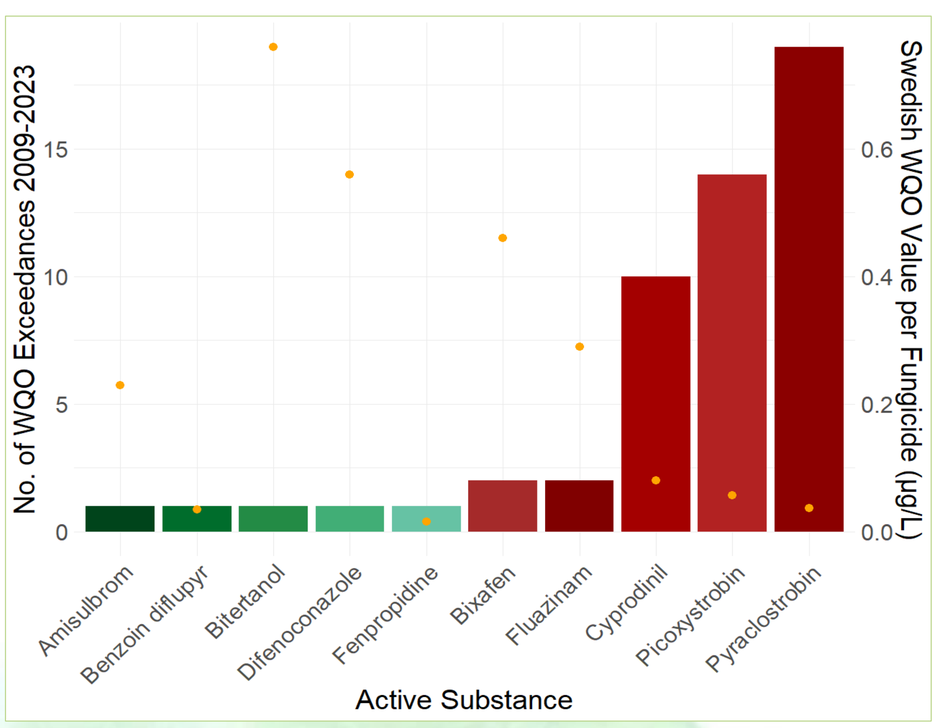


Fungicide Use

- Varied across catchments
- Applied in highest amounts: Propamocarb, Fenpropimorph, and Pyraclostrobin

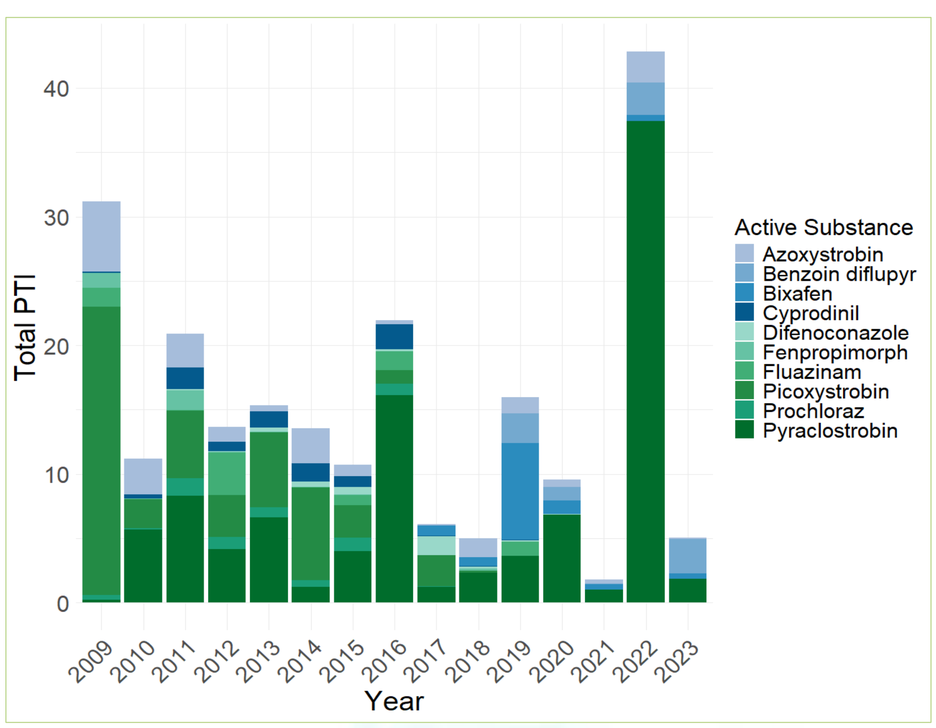
Detection Frequency

- On average 18 fungicides are detected per year
- Most frequently detected: Azoxystrobin, Propiconazole and Fluopicolide



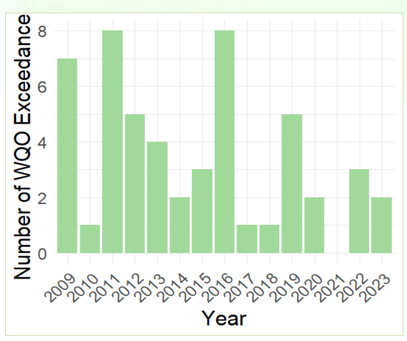
WQO:
Lowest from EFSA reported PENC toxicity values for aquatic species - legally not binding in Sweden.

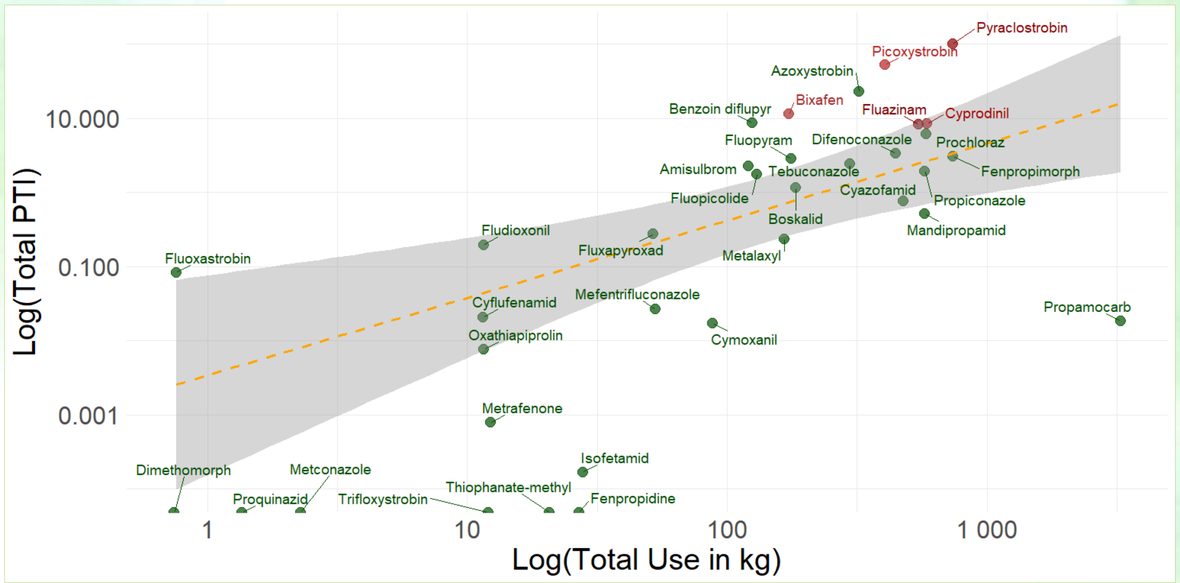
PTI:
Risk quotient of measured concentrations divided by the WQO for each substance.



Swedish Water Quality Objectives (WQO)

- Up to 8 yearly exceedances of WQOs
- Top 3 fungicides exceeding WQOs (2009–2023): Pyraclostrobin, Picoxystrobin, Cyprodinil
- These fungicides have low WQO thresholds: <0.1 µg/L





Pesticide Toxicity Index (PTI)

- Top 10 of the 35 fungicides monitored represent 100% of PTI
- Out of the 10 fungicides: 4 act on fungal respiration (FRAC 7 and 11) and 3 inhibit sterol biosynthesis (FRAC 3 and 5)

Time Trends

Moderate but non-significant decreases for:

- Fungicide use
- Detection frequency
- Total concentrations
- Cumulative PTI
- WQO exceedances

PTI vs. Use

- Fungicides above the trendline – high PTI per kg used (potential for higher risk)
- Fungicides below the trendline – low toxicity per unit used

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