

Educational Brief

Copper Exposure, Permethrin Use, and Combined Toxicity Risks

Public Health and Environmental Awareness Document

Purpose of This Document

This document is intended to educate residents, policymakers, and community advocates about **documented toxicological concerns related to copper exposure, permethrin insecticide use, and their combined effects**. It highlights existing research, observed risks, and public safety considerations. It also clearly states the author's position regarding public health protections.

Background: Copper Research and Environmental Exposure

Research conducted in academic and environmental science settings, including work associated with the **University of Arizona** in Tucson, has examined the biological and environmental impacts of **copper exposure** in soil, water, and living organisms.

Copper is an essential trace mineral in small amounts; however, **excess exposure is well-documented to cause toxicity**, particularly affecting the **liver, heart, and nervous system**. Importantly, **damage from copper accumulation may remain clinically silent until organ injury is advanced**, meaning individuals may not realize harm is occurring until it is severe or irreversible.

Position Statement:

It is my position that copper should not be used at all in combination with residential spray programs in Florida. I believe the combination of copper and insecticides presents an unacceptable health risk to residents.

Permethrin Overview

Permethrin is a widely used **synthetic pyrethroid insecticide** designed to act as a **neurotoxin to insects**. While effective for pest control, permethrin is not biologically inert in humans or animals.

Known Health Effects of Permethrin

- **Neurotoxicity**

Permethrin interferes with nerve signaling by causing repetitive nerve impulses. High or repeated exposure may result in:

- Tremors
- Incoordination
- Muscle weakness
- Hyperthermia

- **Skin and Sensory Effects**

Dermal exposure is associated with **paresthesia**, including:

- Tingling
- Burning
- Itching
- Numbness

- **Systemic Symptoms**

Inhalation or ingestion may cause:

- Dizziness
- Headache
- Fatigue
- Nausea
- Vomiting
- Abdominal pain

- **Long-Term Exposure Concerns**

Emerging research has explored potential associations between chronic exposure and **blood disorders**, including MGUS (Monoclonal Gammopathy of Undetermined Significance), though research is ongoing.

- **Environmental Impact**

Permethrin is **extremely toxic to aquatic life and pollinators**, particularly fish and bees.

Copper and Permethrin: Interaction Risks

Combined Toxicity

Studies in environmental and agricultural toxicology have shown that **copper compounds** (such as copper sulfate or copper hydroxide) combined with **pyrethroid insecticides** (including permethrin and cypermethrin) can result in **enhanced toxicity** in non-target organisms.

Environmental Persistence

- Copper ions in soil can **slow the degradation of pyrethroids**, extending environmental exposure times.
- This persistence increases the likelihood of repeated human and ecological contact.

Health Effects of Copper Exposure

Copper compounds are known to:

- Be corrosive to mucous membranes and the cornea
- Cause metallic taste
- Trigger nausea and intestinal pain
- Accumulate in the liver, potentially leading to **hepatic injury**
- Contribute to cardiovascular stress when levels exceed normal metabolic handling

Concern Statement:

Even short-term exposure (1–3 months) may place significant stress on otherwise healthy body systems. The cumulative and synergistic effects of copper and permethrin are not adequately communicated to the public.

Public Awareness and Risk Communication

Many residents are **not fully informed** about the health implications of residential spray programs or the **combined chemical exposures** involved. This lack of awareness prevents informed consent and limits individuals' ability to protect themselves.

Safety Considerations (Educational Only)

- **Skin Protection**
Avoid direct skin contact with permethrin-treated areas when possible; dermal exposure may cause irritation or numbness.

- **Ventilation**

Ensure adequate airflow in treated environments to reduce inhalation risk.

- **Medical Guidance**

Individuals experiencing symptoms or with underlying health sensitivities should consult a qualified medical professional.

- **Environmental Protection**

Avoid application near water sources due to extreme aquatic toxicity.

Academic Contact (Referenced)

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(Provided for academic reference and research context.)

Closing Statement

This document calls for **greater transparency, precautionary policy, and public education** regarding residential chemical spray programs. When health impacts may be delayed, cumulative, or synergistic, **prevention and informed choice must come first.**