



Bluebird Restoration Association of Wisconsin

Alternatives to Permethrin for Black Fly Management

Approach	How It Works	Benefits	Considerations
Vanilla extract (already used by BRAW monitors)	A drop inside the roof or lightly on chicks deters flies	Simple, bird-safe, widely used	Needs reapplication during heavy fly activity
Pyrethrins (plant-derived, from chrysanthemum flowers)	Break down quickly in sunlight, repel insects	Lower avian toxicity than synthetic pyrethroids	Still a pesticide — avoid spraying directly on birds or inside boxes
Neem oil sprays	Natural insect growth regulator	Eco-friendly, breaks down quickly	Limited efficacy on black flies; must avoid direct chick contact
Insecticidal soaps	Disrupt insect cuticle membranes	Safe for birds if applied externally	Works better on soft-bodied insects; limited against adult flies
Methyl anthranilate (grape extract repellent)	Alters feeding behavior of some insects and birds	Non-toxic, used in bird repellents	More effective for deterring birds than flies
Bacillus thuringiensis israelensis (Bti)	Biological larvicide targeting fly/mosquito larvae in water	Highly specific, safe for birds and mammals	Only works in aquatic larval habitats, not inside boxes
Habitat management	Remove standing water, improve drainage, encourage predators (dragonflies, bats)	Reduces breeding sites naturally	Requires landscape changes; not immediate relief

Risks & Trade-offs

- **Avoid organophosphates (malathion, chlorpyrifos)** — highly toxic to birds and not suitable near nest boxes.
- **Synthetic pyrethroids (permethrin, bifenthrin, cypermethrin)** are effective but carry ecological risks, especially near water.
- **Natural methods** (vanilla, habitat management, Bti) are safest for cavity-nesting birds, though they may require more frequent monitoring and reapplication.

Practical Recommendation for County Contacts and BRAW Members

- Keep **vanilla extract** as the frontline, bird-safe repellent.
- Use **permethrin on box exteriors** only when fly pressure is severe.
- Consider **Bti treatments** in nearby water sources if black fly larvae are abundant.
- Encourage **habitat adjustments** (reduce standing water, promote dragonflies/bats) for long-term control.