

# USDA Investigates How Ultraviolet Cues Influence Blackbird Feeding Behavior: Research May Lead to More Effective Bird Repellents

Researchers with the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) recently investigated the role of ultraviolet (UV) cues in avian food selection. Although it has long been known that birds use UV wavelengths for mate selection, researchers have now learned that UV wavelengths also influence bird feeding behavior and food selection. While UV wavelengths are invisible to humans, APHIS researchers found that birds exposed to an UV-absorbent, post-ingestive repellent subsequently avoided UV-absorbent and UV-reflective food. The researchers hope to use these findings to improve our understanding and management of bird damage to agriculture. These studies are summarized in a recent article titled "The role of a generalized ultraviolet cue for blackbird food selection" in *Physiology & Behavior* (vol. 106, 597–601).

Taste, smell, and sight help birds and mammals identify and discriminate among foods, but these senses play somewhat different roles in food preference and food selection. In studies with captive red-winged blackbirds, researchers at the USDA-APHIS National Wildlife Research Center (NWRC) learned that blackbirds shift preferences for both familiar and unfamiliar flavors based on their feeding experiences and rely on visual cues to avoid food previously paired with negative consequences.

"From our feeding experiments, we learned that blackbirds associate pre- and post-ingestive consequences with visual cues, and they integrate their visual and flavor experiences with post-ingestive consequences to select nutrients and avoid toxins," states Dr. Scott Werner, research wildlife biologist at the NWRC. "For example, blackbirds avoided the color and flavor of food

previously paired with a post-ingestive repellent. In contrast, birds avoided only the color (not the flavor) of food previously paired with methyl anthranilate (a pre-ingestive irritant). These fundamental relationships are helping us develop effective bird repellents for agricultural production."

Several chemical repellents and cues that either absorb or reflect UV wavelengths might be integrated in a management strategy that involves an initial application of a repellent and subsequent application of a visual cue with spectral characteristics similar to the repellent. NWRC researchers plan to investigate the use of UV feeding cues by other bird species and identify the UV wavelengths of agricultural crops associated with bird depredations.

The NWRC is the research arm of APHIS' Wildlife Services program, which is devoted to resolving human-wildlife conflicts. The Center applies scientific expertise to develop practical methods to resolve these conflicts and maintain the quality of environments shared with wildlife. To learn more about the NWRC, visit its Web site at [www.aphis.usda.gov/wildlife\\_damage/nwrc/](http://www.aphis.usda.gov/wildlife_damage/nwrc/).

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