# Pesticides killing amphibians, says study

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A frog peeks up from the water in a pond in Prince William County, Virginia on April 5, 2012. A plunge in the world's population of frogs and toads may be blamed, at least in part, on farm pesticides, researchers in Germany said on Thursday.

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Tests of fungicides and insecticides, when used at recommended

dilutions, killed 40 percent of frogs after seven days, and in one case, 100 percent of them after just one hour, they said.

The experiments, which entailed only a small number of animals, were carried out by a team led by Carsten Bruehl at the University of Coblenz-Landau in Germany.

They collected 150 juvenile European common frogs (Rana temporaria) to expose them to seven agricultural products, the goal being to reproduce in the lab conditions which were akin to those in the field.

The frogs were kept in large containers with soil where barley was grown. The chemical was sprayed once, delivering a volume that the researchers said was equal to the amount that would fall on a similar area of an arable field.

There were three kinds of doses: recommended concentrations; one-tenth of recommended concentrations; and 10 times recommended concentrations.

The most toxic substance, according to the study, was Headline, used to prevent fungus in soybeans and wheat. At recommended dosage, it killed all of the tested frogs within one hour.

Only five frogs were assigned to each experiment, and the animals were used cautiously out of ethical considerations.

In each experiment, only three frogs were initially exposed to the spray, and if they survived 24 hours, the other two were added. If the three died before the 24 hours, the remaining two were not added.

According to the famous "Red List" of threatened biodiversity, 41 percent of frog and toad species are at risk of extinction.

The International Union for Conservation of Nature (IUCN), which compiles the list, blames habitat loss, pollution, fires, climate change, disease and over-exploitation of land.

But the new study, which appears in the journal *Scientific Reports*, says that collateral damage from pesticides has not been considered.

Amphibians are especially vulnerable to these chemicals as their skin is highly permeable, it says.

"The demonstrated toxicity is alarming and a large-scale negative effect of terrestrial pesticide exposure on amphibian populations seems likely," says the paper.

"Terrestrial pesticide exposure might be underestimated as a driver of their decline.... The risk assessment procedures do not protect this vanishing animal group."

Other scientists described the research as interesting but said it had limitations. More work was needed, and in field conditions, to see whether the results were confirmed.

"There are ways in which some of these pesticides might have a mechanism of action that would affect amphibians," said Colin Berry, emeritus professor of pathology at Queen Mary University in London.

But, he cautioned, "these will differ between compounds and so would need examining carefully."