The effect of glyphosate herbicides on lizards

Summary

Glyphosate-based herbicides are one of DOC’s most commonly used herbicides. However, glyphosate-based formulations that also contain the surfactant polyethoxylated tallow amine (POEA) have been found to change skinks’ thermoregulatory behaviour and possibly cause slower sprint speeds. Based on this research, it is recommended that glyphosate formulations containing POEA (e.g. Roundup) should not be used in areas that are inhabited by rare or threatened lizard species.

Research

Background

Glyphosate-based herbicides such as Roundup are the most popular herbicides in the world, yet there are growing concerns regarding their impacts on non-target organisms. Research also suggests that the surfactants within certain glyphosate formulations are actually more toxic than glyphosate itself. Surfactants work by damaging the plant cuticle, allowing the herbicide to penetrate the plant. Although the effect of glyphosate on birds and mammals is well studied, reptile toxicology studies have been neglected in the past because of a lack of regulatory requirements. This research gap is particularly concerning when glyphosate herbicides are used to control weeds in conservation areas that are inhabited by rare or threatened lizards. A short-term lab study was performed in April 2013 to determine the effect of glyphosate with and without surfactant (polyethoxylated tallow amine, POEA) on the New Zealand common skink (Oligosoma polychroma).

Research findings

At the beginning of the study captive skinks were sprayed once only with either glyphosate, glyphosate plus POEA (Roundup), or water. Their thermoregulatory behaviour, sprint speed, and weight were then monitored for six weeks. The study found that skinks sprayed with glyphosate plus POEA selected warmer microclimates (see Figure 1) and had slower sprint speeds than skinks that had been sprayed with glyphosate only or water. Treatment had no effect on weight.

Implications

Skinks that selected warmer temperatures were probably undergoing a fever response in relation to stress. Selecting hotter microclimates can lead to dehydration and greater predation rates, as skinks are more likely to be basking in exposed areas. Sprint speed is an important predictor of lizard health and survival; as lizards with slow sprint speeds find it harder to capture prey and escape predators.
Recommendations

Based on this study's findings, it is recommended that glyphosate formulations containing POEA (e.g. Roundup) should not be used in areas that are inhabited rare or threatened lizard species.

Contact

For more information, please contact Jo Carpenter at carpenter.jk@gmail.com. The study referred to in this factsheet was a Victoria University research project, undertaken with iwi consultation and all necessary permits.

Figure 1. Percentage of New Zealand common skinks (*Oligosoma polychroma*) from each treatment group selecting warmer temperatures each day at 14:00h.

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