

Self-service traps for common vole (*Microtus arvalis*) predators

Annika Schlötelburg^{1,2}, Alexandra Plekat¹, Christian Wolff³, Sonoko Bellingrath-Kimura^{2,4} and Jens Jacob¹

¹ Julius Kühn Institute, Institute for Plant Protection in Horticulture and Forests, Münster

² Humboldt-University of Berlin, Division of Land Use Systems, Berlin

³ Regional Office of Agriculture and Horticulture Sachsen-Anhalt (LLG Sachsen-Anhalt), Department of Plant Protection, Bernburg

⁴ Leibniz Centre for Agricultural Landscape Research (ZALF), Institute of Land Use Systems, Müncheberg

E-mail of corresponding author: annika.schloetelburg@julius-kuehn.de

Common voles (*Microtus arvalis*) are a severe pest species in agricultural landscapes, especially during mass outbreaks. Every two to five years, population size can reach up to 2000 individuals per hectare. Then, voles increasingly migrate from undisturbed grassy field margins to farmland. Farmers often use rodenticides to protect their crops. Efficacy of rodenticides can be hampered by alternative food sources, bait shyness, population size and they cannot be used in organic farming.

A new approach of ecologically based rodent management pursues the idea to inhibit migration from primary grassland habitats to secondary farmland habitats. Suitable methods could be a ploughed furrow combined with traps. Traps need to be checked and maintained regularly and are therefore not suitable to protect large-scale farmland. But involving efficient vole predators could offer a work- and cost-saving tool for rodent management that is also suitable for organic farming. We tested two types of vole traps that can be emptied by terrestrial predators (e.g. foxes), raptors and other birds. We developed one trap with a triangular shape to fit in a ploughed furrow

along field margins. The other trap (standby-box, Andermatt Biocontrol AG, Switzerland) has a lid that can be opened by terrestrial predators to remove captured rodents. In field studies, we tested with camera traps how frequently the two trap types were emptied by predators. Our newly developed trap was emptied more often and by a more diverse group of predators than the standby trap. Only cats (*Felis silvestris f. catus*), racoons (*Procyon lotor*) and foxes (*Vulpes vulpes*) were recorded opening the lid of the standby-box to remove rodents. From the new trap type, voles were additionally removed by stoats (*Mustela erminea*), rats (*Rattus norvegicus*) and a variety of raptors and other birds. Additionally, its opening allows several non-target rodent species to escape. Furthermore, we analysed factors influencing predator access to improve efficacy and animal welfare.

With these improvements, self-service traps could be integrated as large-scale method, so that this new barrier-system can help to manage common voles without rodenticide use and associated risk to wildlife.