Crop and urban systems

Non-chemical rodent management in organic carrot cultivation – vole activity and economic assessment

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Mass reproduction of common voles occurs every 3-5 years. Especially in vegetable production during this time, yield losses are substantial, and total loss can be reached. Damaged vegetables cause increased sorting effort and cannot be sold. In German (organic) cropping, the carrot is the most important vegetable crop with a total yield of almost 800,000 tonnes in 2023. The evaluation of vole occurrence/activity and the cost-effectiveness of non-chemical alternatives for rodent management in this segment is of great importance for farming, as the use of chemical rodenticides is prohibited. Here, common vole activity, damage and yield were assessed in organic carrot fields in North Rhine-Westphalia, Germany. Six fields were protected with a trench and at two fields no vole protection measures were introduced (experimental control). Activity indices were estimated in field edges and adjacent carrot fields from hair tubes or counts of active burrow entrances according to standard procedures to estimate common vole abundance. Vole damage and yield were determined on a field-specific basis. The economic efficiency of the tested measures was assessed with cost-benefit analysis. The direct costs of the management using trenches were compared with the financial losses due to yield reduction in fields without trenches. The resulting vole management cost-free performance is suitable as a benchmark for comparing the results of the field trials with secondary data-based scenario calculations.

First results indicate that during low population density of voles such as in the year 2024 there are no significant differences in vole activity in the field edges and the adjacent carrot fields. However, trenches may lose their effectiveness as a dispersal barrier for voles if they become overgrown or exposed to heavy rainfall. Further information will be collected in 2025 to contribute to the implementation of integrated plant protection in rodent management in organic farming.

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