Comparison of European hare (*Lepus europaeus*) population densities between an eco-farm and a conventional farm

Georg-August University of Göttingen

Wildlife Biology and Game Management Unit
Georg-August University of Göttingen

Ferdinand Rühe[1], Jacqueline Felix[2], Gerold Rahmann[2], Jürgen Ulverich[2], Friedrich Weißmann[2]

[1] Wildlife Biology and Game Management Unit, Dpt. of Forest Zoology and Forest Conservation, Büsgen-Institute, Georg-August University of Göttingen, Büsgenweg 3, 37077 Göttingen, Germany, fruehe@gwdg.de;

[2] Ixnstitute of Organic Farming in the Johann Heinrich von Thuenen-Institute, Federal Research Institute for Rural Areas, Forestry and Fisheries, Trenthorst 32, D, 23847 Westerau, Germany, gerold.rahmann@vti.bund.de

Introduction

European hare (*Lepus europaeus*) populations have not recovered from their shrinking over the past fifty years in Germany. Most hare habitats are agricultural regions which are farmed according to conventional farming standard. Organic farming is characterized by waiving of pesticides, growth regulators and artificial manure, by longer crop rotations and by wider seed seed-row spacings in some cereal crops. Thus, positive effects of eco-farming on hare populations in agricultural landscapes may be assumed. However, eco-farming has not been studied in this regard up to now.

Aim, study area and methods

We wanted to find out whether the population density of European hares differed between an eco-farmed and an adjacent conventionally farmed area from 2004 to 2010. The study was performed from the 4th to the 10th year after starting eco-farming on this site.
Both study sites are approx. 500 ha in size, have the same types of soil and the same climate. They are located about 20 km south of the town of Lübeck, Schleswig-Holstein, Germany. Hare population densities were estimated by spotlight counts in spring and in autumn, at least twice per season and site. After passing normality test and equal variance test, a t-test was applied for comparing two groups.

Results

Mean hare density (± s) of the period 2004-2010 was greater in the eco-farmed area than in the conventionally farmed area, as well in spring (13.37 ± 3.53 vs. 8.24 ± 2.87, t = -2.98, df = 12, P = 0.01) as in autumn (16.10 ± 2.71 vs. 10.60 ± 2.55, t = -3.73, df = 11, P < 0.01).

Hare density fluctuated to a greater extent on the eco-farmed site than on the conventionally farmed site in spring and in autumn (Fig. 1a, b). Due to these between-years variations hare densities did not show significant linear trend lines over the study period.

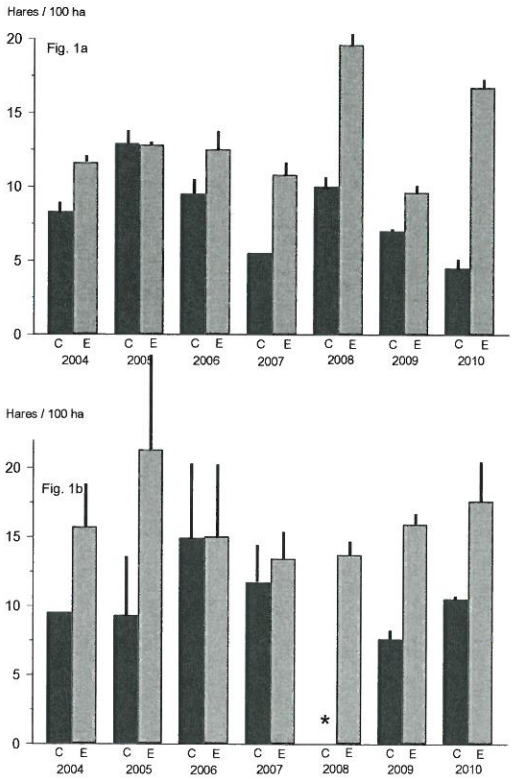

Fig. 1. Population dynamics of hares in a conventionally farmed (C) and an eco-farmed area (E) in spring (Fig. 1a) and autumn (Fig. 1b) 2004-2010 (mean and SD; * no data recorded).

Conclusion

The higher hare densities in the eco-farmed area may be interpreted as results of positive effects of organic farming.

The development of possibly influential environmental features in the eco-farming system as e.g. plant societies and soil characteristics still proceeds, and the conventional farming system alters over time, too. Thus, it is worth to study whether and to which extent hares do benefit from organic farming also in the long run.

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[2] Institute of Organic Farming in the Johann Heinrich von Thuenen-Institute, Federal Research Institute for Rural Areas, Forestry and Fisheries, Trenthorst 32D, 23847 Westerau, Germany, jacqueline.felix@vti.bund.de, gerold.rahmann@vti.bund.de, juergen.ulverich@vti.bund.de, friedrich.weissmann@vti.bund.de.

European hare (*Lepus europaeus*) populations have not recovered from their shrinking over the past fifty years in Germany. Most hare habitats are agricultural regions which are farmed according to conventional farming standard. Whether hare populations benefit from eco-farming has not been studied up to now. We aimed to compare the population density of European hares between an eco-farmed and an adjacent conventionally farmed area from 2004 to 2010. Both study sites are approx. 500 ha in size, have the same types of soil and the same climate. They are located about 20 km south of the town of Lübeck, Schleswig-Holstein, Germany. Hare population densities were estimated by spotlight counts in spring and in autumn, at least twice per season and site. After passing normality test and equal variance test, a t-test was applied for comparing two groups. Mean hare density (± s) of the period 2004-2010 was greater in the eco-farmed area than in the conventionally farmed area, as well in spring (13.37 ± 3.53 vs. 8.24 ± 2.87, $t = -2.98$, $df = 12$, $P = 0.01$) as in autumn (16.10 ± 2.71 vs. 10.60 ± 2.55, $t = -3.73$, $df = 11$, $P < 0.01$). The higher hare densities in the eco-farmed area may be interpreted as results of positive effects of organic farming. It seems worth to continue this study in order to see whether and to which extent hares do benefit from organic farming over a longer period of time.

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Welcome

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