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Damage caused by wild game animals to field crops in the Czech Republic – a historical summary from 1786 to the year 2005

Wildschäden in Feldkulturen in der Tschechischen Republik – ein historischer Überblick von 1786 bis in das Jahr 2005

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Abstract

Wild game animals have caused significant damage to agricultural crops for many years. The oldest written documents concerning this issue date back to 1786 and the reign of Habsburg Emperor Josef II. Damage inflicted upon sugar beet was first mentioned in 1895. In the past, the damage caused by game to field crops was not paid adequate attention in the Czech lands. This was due to the fact that farmers were poorly informed about this issue while also tolerant towards the results of the damage. In addition, it was difficult for them to establish conclusively the cause of the damage. Consistent but incomplete information can be found in documents for the period 1961 – 2005. During this period, damage caused by mouflon (*Ovis musimon*), wild boar (*Sus scrofa*), roe deer (*Capreolus capreolus*), brown hare (*Lepus europaeus*), wild rabbit (*Oryctolagus cuniculus*), pheasant (*Phasianus colchicus*), geese (*Anser*) and rook (*Corvus frugilegus*) was documented. According to these documents, the damaged crops included cereal crops, maize, rape, potatoes, sugar beet, cole, and lettuce.

Key words: Damage caused by game, game stock, field crops

Zusammenfassung

Das Wild verursachte in vielen Jahren gravierende Schäden an landwirtschaftlichen Kulturen. Die ältesten schriftlichen Berichte über diese Schäden stammen aus

der Epoche des Kaisers Josef II. im Jahre 1786. Die ersten Erwähnungen über Schäden in Zuckerrübenbeständen wurden in das Jahr 1895 datiert. Den Wildschäden in Feldkulturen wurde in der Vergangenheit keine entsprechende Aufmerksamkeit gewidmet. Grund dafür war, dass die Bauern wenig informiert waren in dieser Angelegenheit, die Schäden tolerierten und die eigentliche Ursache nicht konkret kannten. Zusammenhängende, aber nicht vollständige Auskünfte, stehen uns erst für den Zeitraum 1961 bis 2005 zur Verfügung. Im obengenannten Zeitabschnitt wurden durch Muffelwild (*Ovis musimon*), Wildschwein (*Sus scrofa*), Rehbock (*Capreolus capreolus*), Feldhase (*Lepus europaeus*), Wildkaninchen (*Oryctolagus cuniculus*), Fasan (*Phasianus colchicus*), Gans (*Anser*) und Feldrabe (*Corvus frugilegus*) verursachte Schäden dokumentiert. Die geschädigten Kulturen umfassten Getreide, Mais, Raps, Kartoffel, Zuckerrüben, Kohl und Salat.

Stichwörter: Wildschäden, Wildbestände, Feldkulturen

Damage caused by game

Damage to field crops caused by game is hardly a new problem, either in the Czech Republic or other countries. Wild game has always been a natural and indivisible part of all ecosystems. Because of their good reproductive potential, some game species are even considered factors that can significantly influence environmental evolution in regard to biotope, ecosystem, and land (AUGUSTINE and DECALESTA, 2003). In general, the more a land was culti-

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vated, the more the living conditions of game deteriorated. And the more that numbers of game increased, the greater the disharmony in the relationship between the natural vegetation and its consumers. Therefore, it is only logical that agriculturally cultivated land with a wide spectrum of different cultivated plants had to start contributing to satisfying the game animals' feed requirements. The intensity of game animals' usage of the fields depended on the species of the field crops (often, also on the variety), and on the actual food supply of a particular environment in general. Other factors, such as the area activity and food specialisation of the game, the presence of snow and its duration, the distance from human communities etc., also influenced the interaction (KAMLER et al., 2005). Moreover, the transition to large area cultivation of land was also a significant factor. Large, undivided, one species crop areas (often reaching up to the forest) coupled with breaking crop rotation patterns and ignoring agro-technical deadlines, as well as many other factors, contributed significantly to the increase in damage caused by game (ŽIŽKA, 2006).

In principle, it can be assumed that the degree of the damage is proportional to the level of threat to (reduction in) agricultural production. The harvest is considered damaged if the yield or the quality of the product has decreased. In the Czech Republic, it is nowadays possible to identify the instigators of the most significant crop damage (in order of frequency): wild boar (*Sus scrofa*), red deer (*Cervus elaphus*), mouflon (*Ovis musimon*), brown hare (*Lepus europaeus*), locally also fallow deer (*Dama dama*), and roe deer (*Capreolus capreolus*). The populations of the stocks of game, which can be estimated by assessing the data provided by the Ministry of Agriculture, show a constant increase in the numbers of most species of ungulate game. Moreover, the stock of wild boar has risen sharply in the course of the last decade. This trend can be confirmed by analyzing hunting data (Fig. 1, 2 and 3).

A common type of damage is where the animals feed on the plants' vegetative organs, particularly on winter crops. This damage takes place when such animals are trying to get through the winter and early spring period. However, a considerable amount of research and real-life case studies show that this often devastating-looking damage (for example, where animals have grazed on rape fields) does not necessarily negatively affect the resulting yield. Nevertheless, the damaging and consumption of establishing or already established generative organs (this applies mainly to cereal crops, sunflower, and maize) is a much more serious type of damage. This type of damage is irreversible due to the advanced growing phase, and directly affects both the yield and the quality of the damaged crop (DVOŘÁK, 2006). Other common types of damage resulting in agricultural loss, apart from the consumption of the plants' parts, are those caused by stamping, treading, crushing, digging up and so on.

In the past, the economic influence of game animals on agricultural enterprises in the Czech lands was not paid considerable amount of attention. This can be put down to the fact that farmers were poorly informed about this issue while also tolerant towards the results of the damage. In addition, it was difficult for them to establish conclusively the cause of the losses. Therefore, given this past situation, it has been rather complicated to compile an unbiased historical account of the occurrence and extent of damage caused by wild game animals on the territory of the Czech Republic.

The purpose of this work was to compile a coherent account (using available sources) that would serve as a historical summary of the damage to field crops caused by game in the Czech Republic. The data on crop damage have never been systematically gathered, and agricultural enterprises have never been required by law to report concrete crop losses. For a more accurate description of this situation, we present the harvested areas of the most frequently damaged crops (Fig. 4) and the data relating

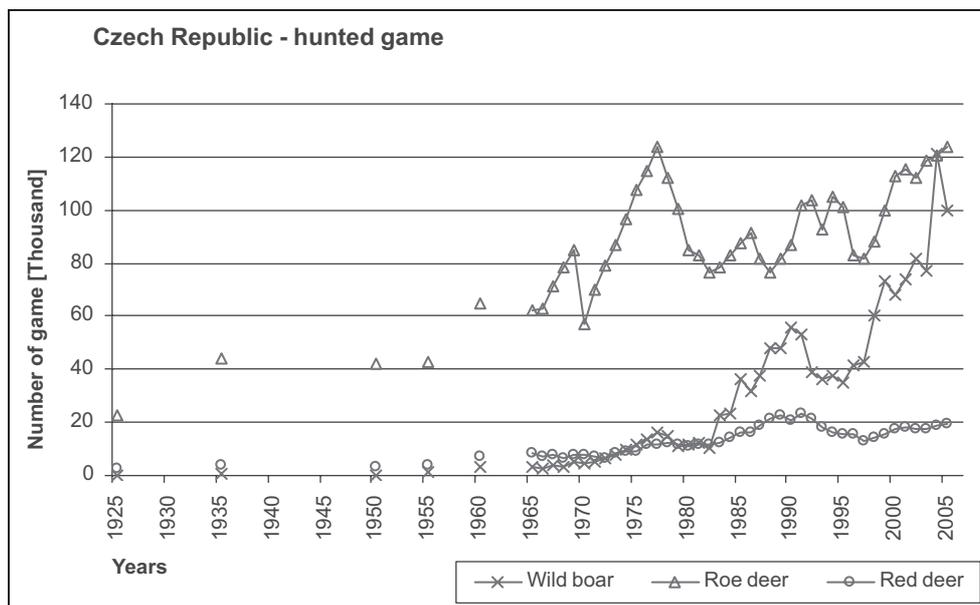


Fig. 1. Hunted game (Source: Ministry of Agriculture of the Czech Republic and DJV-Handbuch 1997 and 2005).

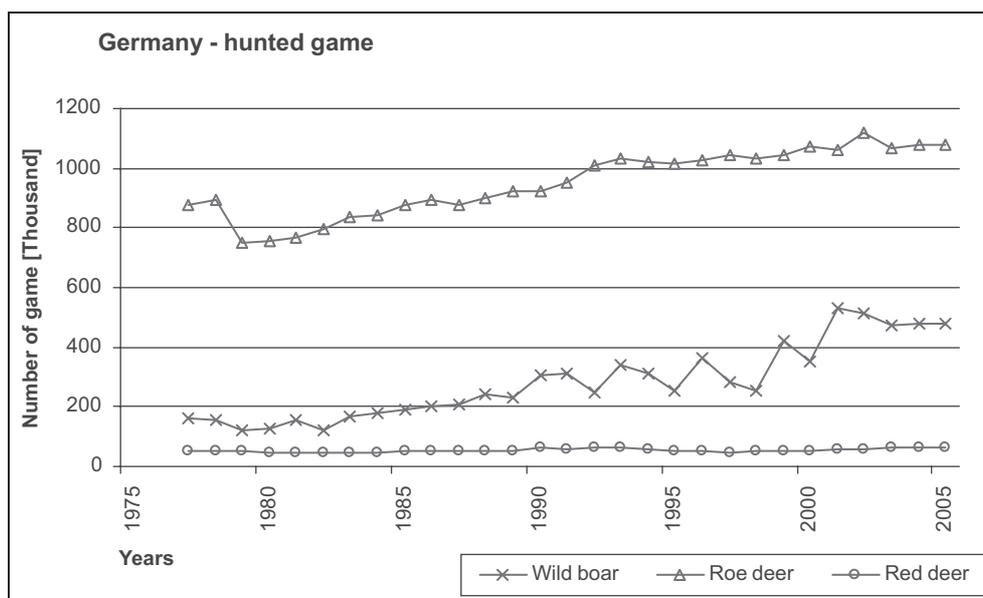


Fig. 2. Hunted game (Source: Ministry of Agriculture of the Czech Republic and DJV-Handbuch 1997 and 2005).

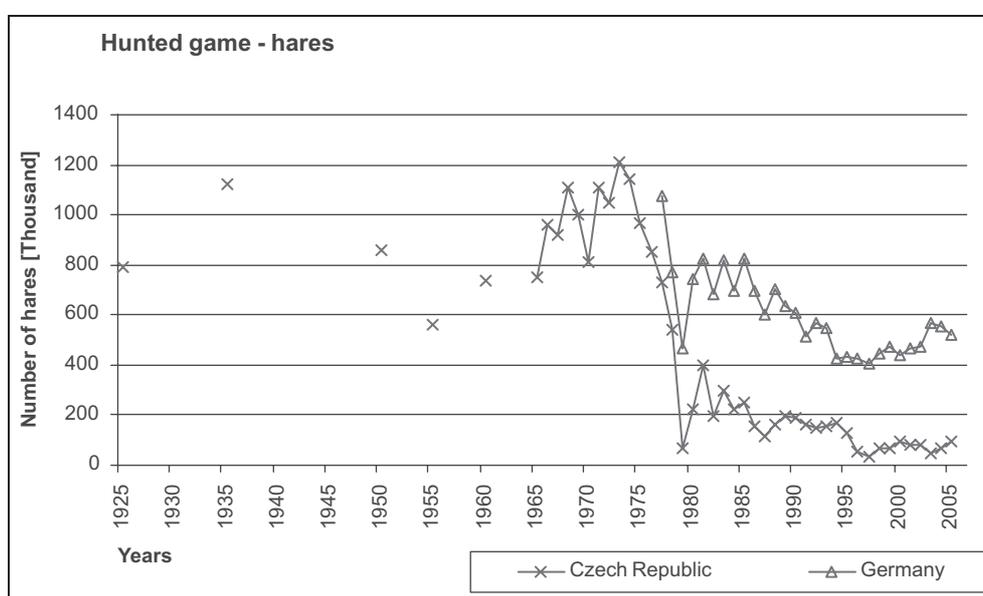


Fig. 3. Hunted game (Source: Ministry of Agriculture of the Czech Republic and DJV-Handbuch 1997 and 2005).

to the actual hunting of game in individual years (Fig. 1, 2 and 3).

Field crop damage caused by game in the Czech Republic up until 1960

The available sources dating to before 1960 provide only general information on crop damage and the need for prevention. For example, the earliest documents show that attempts to protect farmers from the damage caused by game date back to the Middle Ages. In the 18th century, there were a large number of decrees issued that relate to this issue – for example, Císařský královský patent lesů a dříví v království českém se týkající (1754), a ruling issued by Emperor Josef II 1786 – the so-called Josef's Decree etc. (KAMLER et al., 2005). At the end of the 19th century, sugar beet pests included for example: red deer (*Cer-*

cus elaphus), fallow deer (*Dama dama*), roe deer (*Capreolus capreolus*), wild boar (*Sus scrofa*), brown hare (*Lepus europaeus*), wild rabbit (*Oryctolagus cuniculus*), and also badger (*Meles meles*) (SCHMITT, 1895). In 1928, the wild boar was mentioned as being among the most significant of field crop pests. It was pointed out that this animal can damage more than it is able to consume (URBANEC et al. 2005). In the period 1941 – 1943, concrete information on the damage caused by ungulate game on poppy during its generative phases of growth appears for the first time in the literature (KRATOCHVÍL and ZAKOPAL, 1948).

Field crop damage caused by game in the Czech Republic in 1961 – 2005

Data for the period of 1961 – 2005 are available for every year in the summary entitled “Some harmful organisms

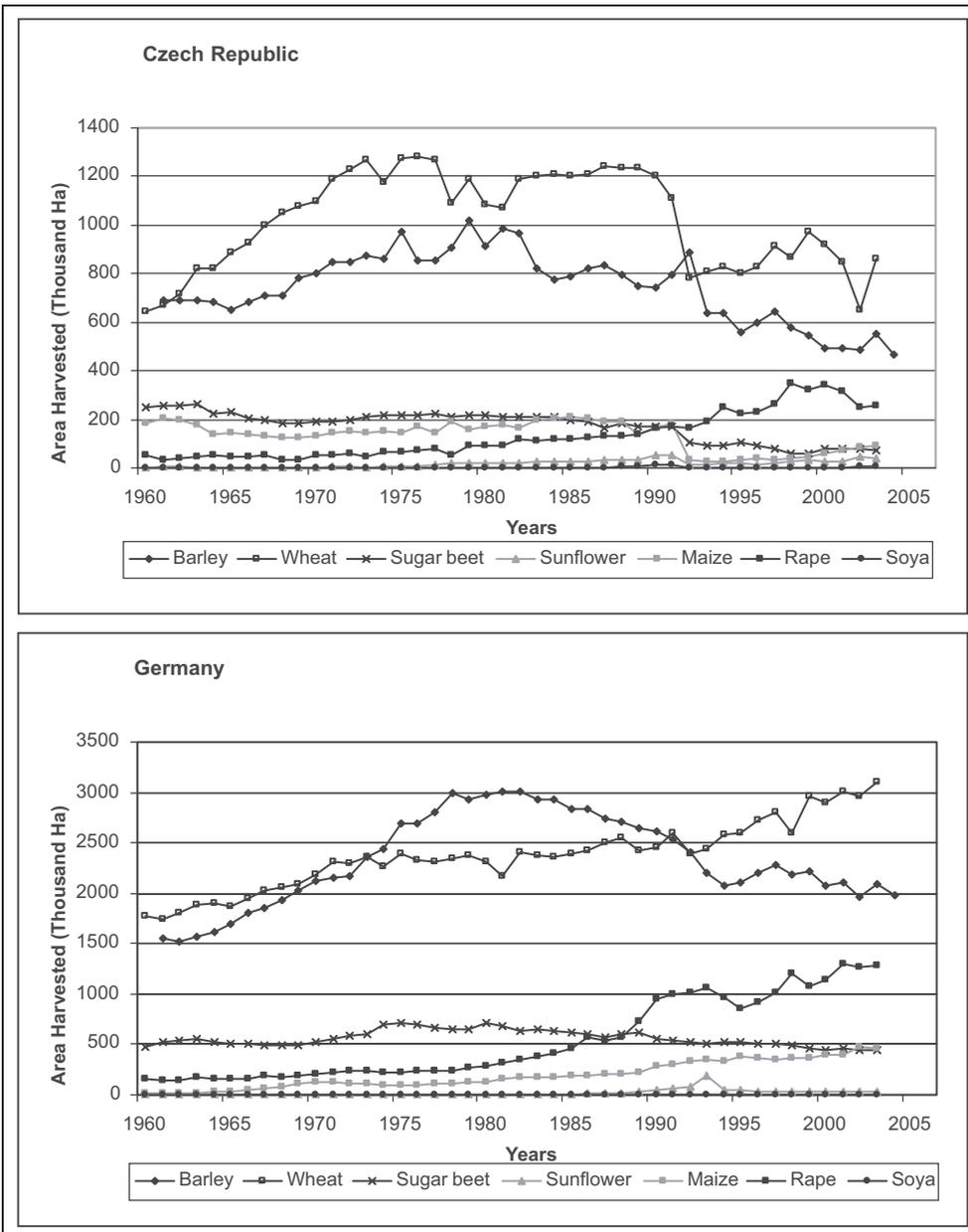


Fig. 4. Harvested area of selected crops in the CR in comparison with Germany (Source: FAOSTAT).

and disorders of cultivated plants occurring in the Czech Republic". There are figures on sugar beet dating back to 1961 in these documents. These summaries were published up to the year 1989 for the whole of the former Czechoslovakia territory by ÚKZÚZ Brno (Central Institute for Supervising and Testing in Agriculture – CISTA) and ÚKSÚP Bratislava (CISTA Bratislava). Since 1990, the summaries have been published by SRS Praha (State Phytosanitary Administration Prague) for the Czech Republic territory only. Therefore, a comparison of occurrences of the above-mentioned pests in the Czech Republic and Slovakia is possible only up to the year 1989. These summaries are, of course, informative in nature, and do not cover all occurrences in the course of the given years.

Tab. 1 displays individual crop species together with their verified damage instigators (RAKUŠAN et al., 1979).

Mouflon (Ovis musimon)

The available sources mention only one occurrence of severe cereal crop damage and this took place in April 1972 in the Jindřichův Hradec district (southern Bohemia).

Roe deer (Capreolus capreolus)

The map in Fig. 5 shows areas where damage caused by roe deer occurred. Field crops in general constitute an important source of nutrition in the roe deer's diet. HOLIŠOVÁ et al. (1982) and OBRTEL and HOLIŠOVÁ (1983a, 1983b) mention that maize is an important part of the roe deer's diet. ZEJDA and HOMOLKA (1980) and NESVADBOVÁ and ZEJDA (1989) indicate that alfalfa, cereal crops, and maize are attractive food sources for this animal in southern Moravia during the September to November season. From December to February, the roe deer feeds on winter cereal crops and sugar beet according to the

Tab. 1. Summary of field crops damaged by game species in the Czech lands in the period 1961 – 2005

Game species	Crop
Mouflon (<i>Ovis musimon</i>)	cereal crops
Wild boar (<i>Sus scrofa</i>)	cereal crops, maize, rape, sugar beet, potatoes
Roe deer (<i>Capreolus capreolus</i>)	cereal crops, rape, cole crops, lettuce
Brown hare (<i>Lepus europaeus</i>)	cereal crops, soya, rape, cole crops, lettuce
Wild rabbit (<i>Oryctolagus cuniculus</i>)	rape
Pheasant (<i>Phasianus colchicus</i>)	cereal crops, maize, sugar beet
Goose (<i>Anser</i>)	cereal crops
Rook (<i>Corvus frugilegus</i>)	cereal crops

same source. The most severe regularly occurring damage was reported to have been inflicted upon rape (for example, approximately 50 hectares were damaged in 2005 in Kožojedy, the Plzeň north district). In 1976, 25 hectares of cereal crops in the České Budějovice district were damaged. Furthermore, OBRTEL et al. (1984) mention sugar beet damage caused by roe deer in southern Moravia.

Wild boar (*Sus scrofa*)

Wild boar is among those game species that have historically caused the most severe damage to field crops in Czech lands (as verified by many authors) (see Fig. 6). According to KOPECKÝ (2006), wild boar causes significant damage particularly to maize. It damages maize throughout its vegetation phase (for example, in May 1973 in the Jičín district, or by the end of the vegetation phase in October 2005 in the Louny and Beroun districts). Cereal crops are damaged mainly in cases when maize is the forecrop (as, for example, in the Písek district in 2005). An increasing significance of crop damage caused by wild boar is evident in the period from 2002 to 2005.

The above observations are also echoed by RAKUŠAN et al. (1979), who state that the wild boar causes damage to field crops, especially to cereal crops and root crops. URBANEC et al. (2005) claim that 85 out of 94 cases of damage by game were caused by wild boar.

Brown hare (*Lepus europaeus*)

The analysis of historical sources reveals that the brown hare caused damage to a number of field crop species. However, the most severe damage was observed in relation to rape crops (Fig. 7), for example, in March 2003 in the Karlovy Vary, Sokolov and Bruntál districts. NESVADBOVÁ and ZEJDA (1989) propose that the brown hare native to southern Moravia causes damage mainly to maize, alfalfa, and winter type cereal crops (rape was not a major crop in southern Moravia at the end of the 1980 s). In addition, VINCENC and KOZÁK (1991) mention the occurrence of damage to sunflower caused by brown hare in the Znojmo district (southern Moravia).

Wild rabbit (*Oryctolagus cuniculus*)

The only report of damage caused by wild rabbit comes from Bílov (the Nový Jičín district), northern Moravia,

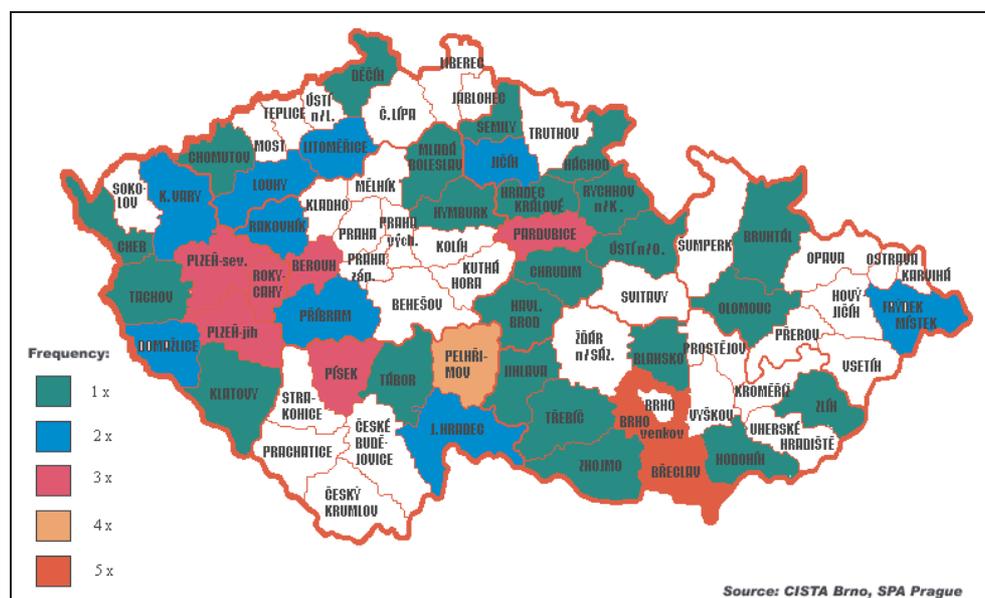


Fig. 5. Frequency of reported field crop damage caused by roe deer (*Capreolus capreolus*) in CR in 1961 – 2005 (districts).

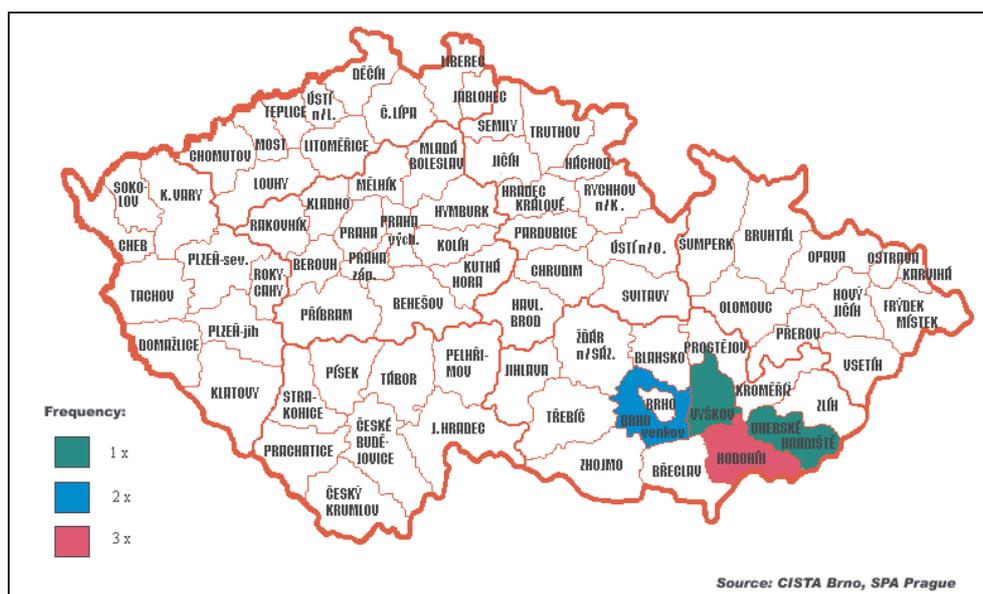


Fig. 8. Frequency of the reported field crop damage caused by pheasant (*Phasianus colchicus*) in CR in 1961 – 2005 (districts).

crops damaged. The creation and practical application of an authoritative methodology of evaluating the impact of the damage on crop production would be a significant contribution towards resolving the large number of disputes between farmers and owners of hunting grounds. On the other hand, the extent of the effect of the foraging behaviour of game animals on the vegetation has, undoubtedly, depended on the numbers of the stock of game. Therefore, a solution to the game versus vegetation issue is generally rooted in finding a balance between the stock of the populations and the capacity of the ecosystems. A meticulous application of the principles of agricultural sustainability by farmers represents an important means of preventing damage to crops caused by game.

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