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SCARING OF CARRION CROWS (*CORVUS CORONE CORONE*) BY SPECIES-SPECIFIC DISTRESS CALLS AND SUSPENDED BODIES OF DEAD CROWS

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This study was carried out at the Swiss Ornithological Station in Sempach, Switzerland. It was part of a project on the prevention of bird damage in agriculture, sponsored by the Swiss Federal Department of Agriculture.

INTRODUCTION

In Switzerland, carrion crows can cause considerable damage to sprouting corn fields when feeding on the germinated corn. I tried to evaluate a method to prevent these damages. The use of species-specific distress calls, for the first time described by Frings and Jumber (1954), seemed to be the most promising method. Agronomes and biologists have applied it in field studies to several different bird species causing damage in agriculture and on airports (e.g., Gramet, 1962; Brough, 1968). However, the literature either describes single actions or several different scaring devices being used together. To be able to judge the method, quantitative information about reduction of damage, habituation, and some practical information about the construction of an effective apparatus was needed.

PILOT STUDY

By choosing a rubbish dump for the first pilot study, an attractive food source for crows where more constant conditions can be expected, I tried to minimize the drawbacks of an experiment on a corn field. The pilot study was carried out in March 1980. Ten to 20 crows are regularly present at the dump, where they feed, repose, and also show social behavior.

In the first part of the pilot study, the undisturbed crows at the dump were observed for two days. In the second part, distress calls were emitted for 20 to 30 seconds from the edge of the dump as soon as a crow was about to land in the dump for eight consecutive workdays. Because of increased human activity in the rubbish dump in the afternoons, observations were carried out from 0700 to noon.

Figure 1 shows the frequency of the number of crows observed per 5-minute interval in the control phase and in the experimental phase. The median of the number of crows observed was seven during the control phase and zero during the experimental phase (difference highly significant, Kolmogoroff-Smirnoff, $p = 0.001$).

The time elapsed before the crows returned to the dump after having been scared away by distress calls became longer after every emission of the call (Figure 2). This trend of a positive correlation was observed in both weeks of the experiment. After the weekend the time elapsed was as short as in the first week and then increased again. If habituation had occurred, an opposite trend would have been observed.

So the emission of a total of only 13 species-specific distress calls was successful in keeping the crows from the rubbish dump, a very attractive food source, for the

mornings of eight consecutive days. The experiment was ended before any sign of habituation had been observed.

FIELD STUDY

In May 1981 the method of species-specific distress calls was used in a field experiment on sprouting corn fields. Considering the results of the pilot study, I expected the species-specific distress calls to be an effective method in scaring the carrion crows from the fields. The duration of the experiment would be longer than the pilot study had been; corn fields constitute a much less attractive food source for the crows than the rubbish dump. The apparatus consisted of a timber which regulated the duration of the broadcasting intervals (25 minutes OFF, 20-30 seconds ON); the cries were broadcast from a waterproof tape recorder by two loudspeakers from dawn to dusk.

In the same field experiment another scaring method, suspended bodies of dead crows (seven per hectare, 1.5 meters above ground), was evaluated. In Switzerland this method is frequently used by farmers.

The experiments were carried out on 12 paired triplets of corn fields (= 36 fields). The fields were all very susceptible to crow damage. They had an average size of one hectare, and the fields of one triplet were within an average distance of two kilometers. In each triplet, one randomly selected field was treated with distress calls, one with suspended bodies of dead crows, and one was untreated for comparison. The treatments started with the sprouting of the plants and ended after 10-18 days when the plants had about six leaves. Damages were counted on each field every three-four days on marked double rows of corn which had a total length of 1000 meters and were at regular intervals over the field. The three different treatments were compared with the multiple comparison of Wilcoxan and Wilcox (Sachs, 1978).

The fields treated with distress calls had significantly less damage than the fields treated with the dead crows and the untreated fields ($p = 0.05$); no difference was found between the amount of damage on the untreated fields and the fields with the dead crows. On all fields, however, very little damage occurred. Eighty-three percent of the fields with dead crows or no treatment had less than 0.05% damage (100% = average density of plants), 62% had less than 0.1% damage.

Some observations about the occurrence of damages on the fields could be made. Figure 3 shows the relationship between damage and sprouting date of corn; the two squares deviate remarkably from the rest of the points. These were the only two fields which were flooded for some time before sprouting. Extreme wetness seems to be a reason for crow damage. Omitting these two points, a highly significant correlation between damages and sprouting date was found ($r = 0.99$; $p = 0.001$). There was also a highly significant positive correlation between damage and duration of period susceptible to damage, as well as a significant negative correlation between sprouting date and duration of period susceptible to damage. The partial correlation coefficient between sprouting date and damage, omitting duration of damage susceptible period, is $r = 0.9584$ ($p = 0.001$). The other partial correlation coefficient (damage and duration of susceptible period, omitting sprouting date) is not significant. It therefore was concluded that the important influencing factor for damages was the sprouting date.

Distress calls proved to be a very effective method to keep carrion crows from sprouting corn fields, while suspended bodies of dead crows had no scaring effect. With distress calls, the chosen intervals of 25 minutes with 20-30 seconds broadcasting proved to be appropriate.

Among the factors influencing crow damage on corn fields, the most important was extreme wetness. Another factor of importance was the date of sprouting of the plants. A possible reason for this is that earlier in the year crows find less food, which causes them to search the ground and forage on all possible sources; open arable land is frequently visited as it offers much insect food.

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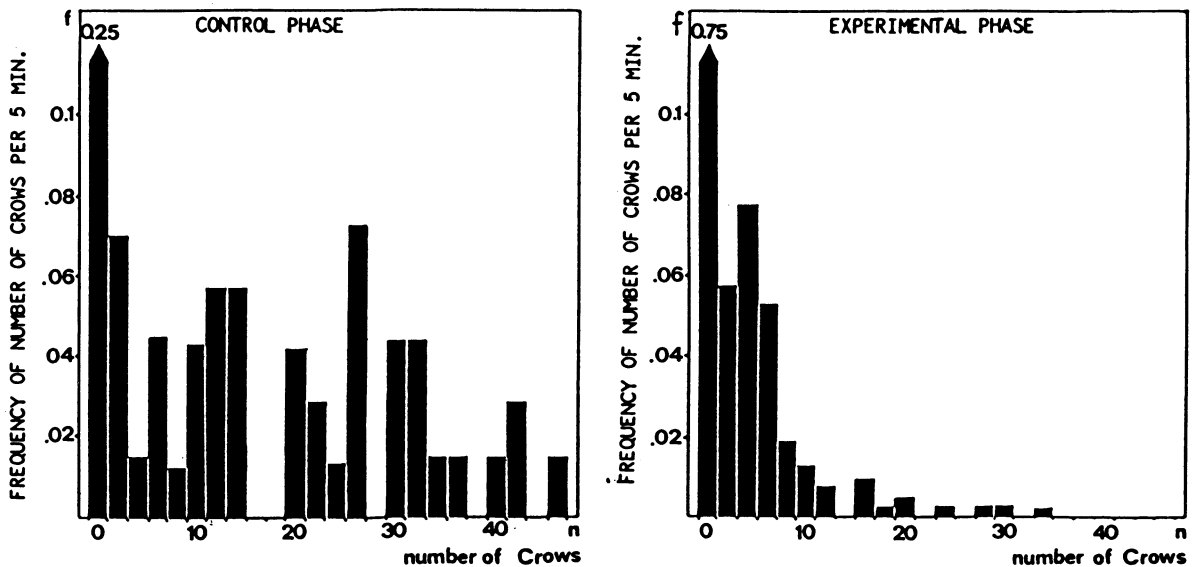

FIGURE 1. Frequency of the number of crows per five minutes

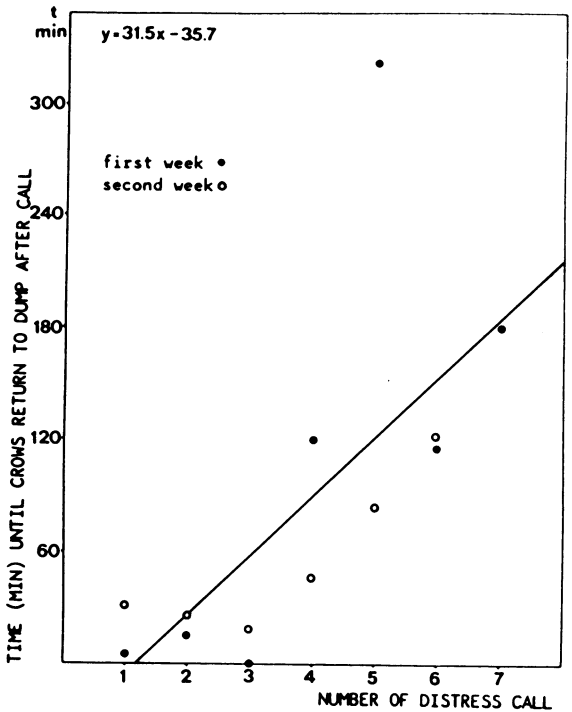

FIGURE 2. Time elapsed until crows returned to dump (ordinate) and number of distress call

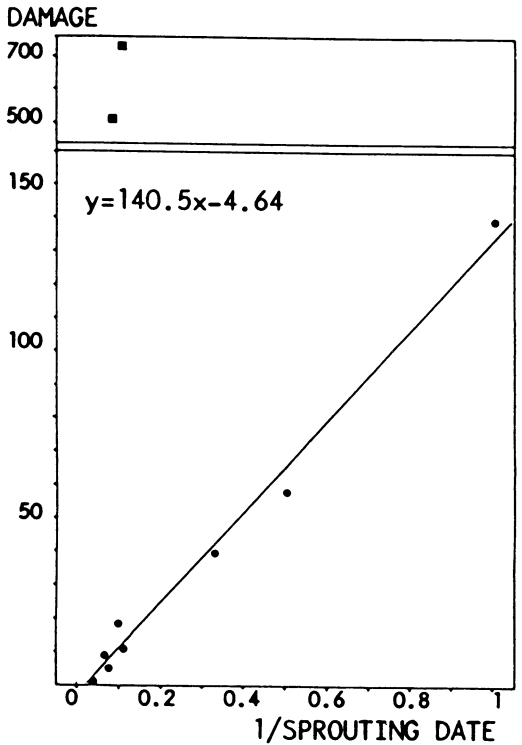

FIGURE 3. Correlation between damage and 1/sprouting date. Correlation highly significant ($r = 0.99$, $p = 0.001$).