

## **The protection of crops from damage by wildfowl**

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WILDFOWL still provide some of the grandest natural spectacles in Britain; skeins of geese with their haunting cries; flights of duck against the sunset; the ethereal beauty of swans. Wildfowlers, too, consider that geese and duck are the most exciting of quarry. Thus many people, for a variety of reasons, are rightly determined to conserve these species in at least their present numbers and any move to eliminate them would be strenuously opposed. Nevertheless, in a small crowded island like ours, where almost every available acre is pressed into cultivation, it is inevitable that wildfowl should feed to some extent on agricultural land. Fortunately, the bulk of wildfowl are migratory and do not arrive before the end of September or in October, too late to cause damage to unharvested crops and, again, most have left by the end of April. In the autumn ducks and geese concentrate on taking harvest wastage such as spilled grain from the stubbles or groundkeepers from old potato fields and so perform a useful cleaning function. Later the geese, and rarely swans, graze grass and winter wheat that in spring recover completely. The eating of swedes or growing beans in a few restricted localities and the grazing of spring bite grass or spring-sown cereals by swans and geese is rather a different matter. Occasionally, also, a flock roosting on autumn-sown fields, particularly if these are waterlogged, may puddle the soil. Unlike Wood-Pigeons, wildfowl present a very minor problem to the farming community as a whole and they cannot be considered pest-species but, at some times and in some places, it becomes necessary to discourage them. The prevention of damage might be tackled in a variety of ways: by the siting of the crop, physical protection, chemical protection, behavioural control, bird-scaring devices, and by the actual reduction of waterfowl numbers.

In the majority of cases, where normal rotation is followed, it is difficult to position a crop away from the source of attack. However, feeding sites commonly utilised by ducks, geese and swans are adjacent to water on which they roost and a farmer may be well advised not to put a valuable crop in such a field. On the other hand, meadows close to habitations and to thoroughfares are the least likely to suffer. Physical protection, by putting the crop under netting, is impracticable on a large scale, and the study of chemical protection against birds is still in its early stages. The application of a substance to a crop which will render it unattractive but not kill would be very advantageous but our knowledge of sensory physiology in birds is not yet sufficient to provide the basis for selecting a repellent. A variety of substances relying on the sense of taste has been tried unsuccessfully with ducks (Neff & Meanley, 1956). Whole barley soaked in gum turpentine and in kerosene was completely eaten and the commercial American repellent Pestex, dusted on to the grain, did not even slow down the birds' feeding rate.

The study of behaviour reveals that avian species react differently to the same stimuli and what deters one has no effect on another. For instance, geese recognise distant objects far better than ducks do (Engelmann, 1955), an important consideration in the placing of scaring devices. The Greylag is more difficult to frighten (and so more easily tamed) than most other geese. Some birds react violently to hawk-like objects or to alarm calls made by members of the same species. The imitation of avian predators, by helicopters

for instance, on a scale practical to farming seems unlikely in this country, but investigation might be made into the effect of alarm calls on waterfowl. One sub-species of goose, the Greenland Whitefront, hardly ever feeds in flocks of more than a few hundred and generally in much smaller groups. Comparative ethological studies might throw light on this behaviour and indicate how other species could be encouraged to do likewise.

### Bird scarers

Scaring is the most popular and suitable method of preventing damage. Almost anything totally strange produces an avoidance response in birds for a while and if it is associated with unpleasant circumstances the response is enhanced. Bird-scarers on the market do no direct harm but normally rely for their effectiveness on the bird associating erratic noise or movement with death or injury by shooting. Scaring devices must be placed in the fields before the feeding birds become well established there and co-operative action among farmers will help split up large aggregations of birds. The following paragraphs give details of a variety of commercial and home-made scarers and make some assessment of their success.

*Mechanical Carbide Bangers and Bird Scaring Ropes.* A number of mechanical carbide detonators are produced which rely entirely on noise as the scaring agent. The apparatus consists of a carbide cylinder and water feed system with a trumpet to direct and amplify the sound produced.

Effectiveness is claimed for all birds and mammals over long periods, although one manufacturer recommends "an occasional shot from a gun to shows the birds the bang means business". One banger is said to protect 50 acres and to be unaffected by wind, rain or snow. Initial outlay is high, but running costs are low, approximately 4-5 ozs. of carbide being used in a day. It is necessary to re-charge with water and carbide every few days and the device is more effective if moved frequently. Some of these detonators are fitted with automatic timing devices which switch them off at night. While this may be essential if they are sited near habitation, it renders them ineffective for ducks and geese feeding after dark.

Carbide bangers are recommended by the Pest Control Division against pigeons and Stephen (1961) in a paper on the use of acetylene exploders to control duck damage in Canada, reported a reduction in the number of insurance claims by farmers when one exploder was used per field. Carbide guns have been very successful when operated once every three weeks to keep Canada Geese off certain fields when the birds were able to find alternative grazing.

The Blanch Banger costs £16 or £25 with a 7-day timing unit; the Exid Thunderbird £19, and the Lon Scarer £16. 16. 0d., plus £7. 10. 10d. for an automatic timing device. Carbide costs from 14/- for a 7 lb. tin to £5. 10. 0d. for a 110 lb. keg from A. B. Blanch & Co. Ltd.

Ropes of bangers are commonly used against birds in various parts of the country, but are considered less successful than carbide bangers because the scaring effect wears off more quickly. The device, consisting of a fuse which is lit and along which twelve fireworks are strung at intervals, cannot be turned off at night and requires frequent renewal. It is possible to buy night ropes, which have twelve bangers, but a longer piece of twine to burn before the first

firework is reached. These are lit at dusk and should start banging at dawn, although the rate of burning is affected by wind speed. The Lepco scarer costs 29/6d. for a dozen day ropes and 32/6d. for a dozen night ones.

*The "Red Man" and other Scarecrows.* One mass-produced scarecrow consists of a two-dimensional man raising a stick as if to shoot, his jacket and hat being painted a fluorescent red and his trousers cut from black plastic. The manufacturers claim that this creates "the image of danger to marauding birds. In severe weather, when birds are willing to take risks, it should be used in conjunction with bird scaring ropes or carbide bangers". Erratic movement is supplied when the scarecrow swings with the wind and by the flapping of the trousers. Farmers speak highly of the value of its unnatural colour for keeping small birds and pigeons away from crops for short periods in the summer. Its disadvantages with geese in winter are its flimsiness in strong winds, that it needs to be kept upright and freely swinging and that its position must be changed frequently. The Maukin bird-scarer costs £5.

Many farmers say that nothing keeps the birds away as adequately as home-made scarecrows. These designs vary and it seems that what continues to frighten birds in one place quickly becomes useless elsewhere. A number of features are particularly recommended: (a) make the scarecrow larger than life, but otherwise make it as lifelike as possible, (b) some part of it should flap in the wind, (c) use some colouring, particularly red, (d) add a string of bangers, (e) change its position regularly, about every three days, and use one per five acres in fairly flat country. The highest points of a field, where geese usually alight, should be well supplied.

Many farmers use oil drums and barrels from which an occasional shot is fired and these may be excellent; again, the position in the field has to be changed frequently.

*Electric Fencing and Lights.* Electric fencing, about 1½ feet from the ground, and operating at normal voltages, prevents Mute Swans walking on to fields adjacent to rivers and marshes and will be useful, rather nearer the ground, against ducks and geese in similar situations. The deterrent effect of walking into the wire a few times may be sufficient to keep swans from flying over it on to these fields and one in a field might frighten geese away. Revolving 1000-watt lights have also been used with some success in fields to keep night feeding waterfowl away (Stephen, 1959). In the Hebrides, crofters used to put lighted lamps in the fields at night before harvest (J. Campbell, pers. comm.).

*Wind-blown Devices, Bodies and Feathers.* Hochbaum *et al.* (1954) controlling duck depredations around Lake Manitoba, had considerable success with a bird-scaring bag swung from an angled pole. They used brightly coloured mesh vegetable bags filled with straw and tied to a 10 ft. pole placed at such an angle that the bag swung freely. At the top of the pole a few feet of metal stripping or a tin "flasher" were secured. Three or four placed where the ducks were feeding usually prevented further visits, but in one 60 acre field, where a feeding habit had been established over several days, they had to use 16 structures before the birds returned no more. One farmer has tried coloured balloons and found them successful. A heavy duty rubber is needed and gas filled ones will swing in the breeze most effectively. Revolving devices that work on a windmill principle are also useful.

The feathers from a dead bird plucked and scattered over a field keep pigeons away, and one farmer has used this method with geese with success.

A number of others use bodies and wings, nailed to posts or hanging from poles. Bodies laid on the ground where the birds normally land are also effective. Most farmers who use these methods are convinced that they work better than conventional scarecrows. Even these devices require regular moving and it is important that some part of the body is free to flap and look "unnatural". The density required for these devices seems to be rather less than that needed for scarecrows; some farmers use only one per field if it is nailed to a post and freely swinging.

*Dogs, Men and Aeroplanes.* Dogs are the only scarers, apart from man and electric fences, which can be recommended for swans. Mute Swans can be very phlegmatic and even the wild Whooper Swans are considerably less easily disturbed than geese. They will not allow a dog to come very near, although it takes a determined and well trained animal to run at them. A sheepdog, which normally works at some distance from its master, should be able to do this quite easily. Helm (1951 unpublished) found dogs of great value in keeping Canada Geese away from crops in Manitoba. One Scottish farmer put a kennel, a bitch and her litter of puppies in the middle of a field and kept geese away successfully! In Eastern Germany, experiments with stuffed foxes in damaged fields have produced good results (G. Bergman, pers. comm.). Human beings are always effective in keeping birds away for a while. Three or four visits to a field every half hour after dawn may be necessary to keep geese off for a day and a blank fired into the midst of the flock certainly helps. In North America, where large scale and costly bird scaring is undertaken, aeroplanes and helicopters are employed to fly low and lift birds off the crops.

### Shooting

In certain circumstances it may be necessary to shoot some of the birds, but it must be stressed that this method of control should be used as a last resort and then only in conjunction with other scaring methods. Hochbaum *et al.* (1954) were successful in regularly removing ducks from fields up to one-half mile away with the blast from a 12-gauge shot gun, blank shells being as effective as cartridges. They supposed this to indicate that ducks need not be killed for scaring to be effective. Unfortunately, since no study has been made of the scaring of a population of birds which no one else was shooting and killing, their theory has not been adequately tested and, in fact, reports indicate that birds become increasingly difficult to frighten with bangers after the end of the shooting season. It is sometimes maintained that, for pigeons at least, the whoosh of a rifle-bullet is more frightening than the report of a shot gun; however, the use of rifles in a farming community cannot be recommended.

The Protection of Birds Act, 1954 makes shooting the only means by which wildfowl may be killed; the destruction of eggs (except of Goosander and Red-breasted Merganser in Scotland) or of young and the use of traps, narcotics and poisons are illegal. The close season for geese and ducks starts inland on 1st February and ends on 31st August. However, the 1954 Act states that a person shall not be guilty of an offence if he kills a wild bird, other than one included in the First Schedule, during the close season, if he can show his action was necessary for preventing serious damage to crops (Section 4, Sub-section 2(a)). This means that the Mute Swan, Bean, Canada, White-

fronted, Pink-footed Geese and most species of duck may be shot at any time to prevent serious damage. (Birds shot during the close season cannot, of course, be sold).

The Greylag, which constitutes a special problem at the present time, may be shot during the shooting season, when it is on the Third Schedule, but may not be killed during the close season, when it is on the First Schedule (to protect birds breeding in north Scotland). The Whooper Swan, which may not be shot at all, as it is included in the First Schedule the year round, is the subject of a few complaints, but the numbers are small and they are relatively easy to deal with.

In some rare instances it may be necessary to attempt a significant reduction in wildfowl numbers by a deliberate shooting policy. This is not to be entered into lightly when dealing with a shifting population of migrants, since a wholly disproportionate number of birds might be killed to little effect. The relatively small flocks of feral geese, that is, those established by Man and breeding in the same area as that in which they winter, may however sometimes require thinning out.

#### **Financial compensation for damage**

In some parts of North America co-operative insurance against crop damage is taken out by all farmers in an area liable to attack. In such cases damage suffered will be mainly to unharvested grain crops where a loss can be fairly calculated in monetary terms. Similar considerations apply in Holland where each sportsman pays ten guilders into a central fund and farmers may claim a refund from this if they suffer damage which could not be prevented. It is doubtful if compensation schemes could be made effective in the conditions obtaining in Britain. Such damage as occurs is largely a matter of timing—early bite grass eaten just when it is wanted for lambing, and spring cereals checked by grazing. Such losses are extremely difficult to assess in concrete terms. Moreover the extent and nature of the damage will vary widely with the weather conditions both before and after as well as during the time damage is being done. Again there is the difficulty of proving that the damage was done by wildfowl when there are a number of other animals, especially hares, feeding on the same crops. Some landowners, concerned with the conservation of flocks of geese traditionally feeding on their land, have allowed a lower rental to their tenant farmers on the understanding that the birds will be left undisturbed. It is possible that a similar system could be made more widespread.

#### **Discussion**

The best commercial bird-scarer is the carbide exploder, which can be supplemented by an occasional shot from a gun. The best home-made devices are scarecrows and dead birds or feathers. Whatever method is used constant variation of site and an adequate density are essential, and it may eventually be necessary to change the type of scaring device. Bangers and perhaps electric fences should be used at night, although sometimes the damage is done before the farmer is aware of the birds' presence. The value of electric fences should be further investigated: they are cheap and many farmers already have them but do not normally use them in winter. It must be emphasised that none of these methods is successful for long unless the birds have somewhere else to

feed undisturbed and if the birds are to be allowed peace they may need special feeding areas set aside for them. The "management" system has progressed a long way in North America where crops are specially planted for waterfowl to draw them away from farmland (Givens & Atkeson, 1959); however, feeding refuges on the small scale suitable to our country sometimes create new problems in surrounding areas. Mr. Peter Scott has suggested that the setting aside of farmland where wild geese are tolerated might be as valuable for the World Wildlife Fund as a monetary gift. Fortunately in some ways, the system already functions in Scotland and England where landowners encourage the geese for their sporting or aesthetic interests, as the Berkeley Estates have done for centuries on the New Grounds at Slimbridge.

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