

Grower Summary

FV 426

A review of the woodpigeon costs to Brassicas, salad crops and oilseed rape and the effectiveness of management activities

Final 2014

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Further information

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GROWER SUMMARY

Headline

Empirical data on woodpigeon damage to Brassicas and salad crops and the cost-effectiveness of mitigation measures is limited and constrains the identification of the optimum management plan. Current best practice advice is to devise integrated strategies that incorporate and vary the deployment of different combinations of mitigation techniques.

Background

The woodpigeon *Columba palumbus* is recognised as a major agricultural pest in the UK, feeding on a range of arable crops including oilseed rape, other brassicas and leafy salads.

For growers, the development of a cost-effective woodpigeon management plan requires assessments of the economic value of the crop damage, against which the financial value realised through a reduction in damage achieved by implementing management measures can be assessed.

Research into woodpigeon crop damage and the effectiveness of management measures to mitigate woodpigeon damage, however, are largely historical. The current project, therefore, reviewed both the evidence for the levels of damage caused by woodpigeons to brassicas and salads and the efficacy and cost-effectiveness of deterrents and other management techniques currently available, including any novel and emerging techniques that might be applied to the problem.

Summary

- The woodpigeon is recognised as a major agricultural pest in the UK. The population has grown significantly over the last 40 years and was estimated at 5.4 million pairs in 2009.
- A review of woodpigeon damage to brassicas, salad crops and oilseed rape revealed very little empirically derived data. One of the very few studies (1989) indicated that yield loss in severely damaged areas of fields of oilseed rape was a mean of 9% ($\pm 6\%$) lower than in areas that had negligible damage. These

damage estimates, however, are historical with no contemporary studies undertaken in the context of current woodpigeon populations and farming practices.

- A limited phone-based consultation exercise with a sample of brassica, oilseed rape (OSR) salad and legume growers indicated that woodpigeons were perceived to impose a significant impact on crops – generally considered to be in the order of 10-40% loss in yield. The problem was considered to be increasing.
- Attempts to mitigate damage using scaring techniques were undertaken by all growers consulted, with the majority utilising two or more different types of device. The most frequently used were pyrotechnics and gas cannons. The majority of proponents of these methods considered them to be at least moderately effective (i.e. at least 25% decrease in woodpigeon numbers or crop damage).
- Amongst growers woodpigeons were shot using flighting/decoying, roaming (rough shooting) and roost shooting. In all cases where a view was expressed shooting was considered to be at least moderately effective (i.e. at least 25% decrease in woodpigeon numbers or crop damage).
- The integration of additional categories of mitigation measure was more limited with exclusion methods (netting, covers) being used only on salads and legumes and habitat modification (sacrificial crop) reported by only one grower.
- The growers' estimates of the economic loss associated with crop damage ranged from £125/ha for OSR, £250/ha for peas and £330-£1,250/ha for brassicas but in general estimates were often broad, lacked detail or not provided.
- Cooperation and coordination of woodpigeon management between neighbouring growers was almost invariably very limited and restricted to shooting. At one extreme, cooperation was avoided as woodpigeons on neighbouring crops was considered preferable to having the birds on one's own farm.
- A review of avian management techniques was carried out that focussed on methods that had been applied to woodpigeons, or other Columbiformes. However, the review also included the evaluation of selected measures used against avian species in other settings (e.g. airports) for their potential

applicability to the context of woodpigeon crop damage, and to any new developing deterrent technologies.

- Traditional visual and auditory scaring techniques varied in their efficacy, from very effective to ineffective. All techniques in these categories are subject to habituation and hence benefit is short-term. Habituation can be delayed and the effectiveness maximised by integrating a number of different techniques and varying their combinations and presentation.
- Topographical features were associated with the level of crop damage. In fields of OSR damage levels were inversely related to the proportion of the field bordered by house and/or roads, and positively related to the presence of a woodpigeon roost within 1km. For Brussels-sprouts and cabbages the severest damage occurred on fields that were peripheral to the main concentration of the crop. The scope for consistently locating crops away from the most vulnerable locations is very limited.
- Chemical repellents used to protect crops from avian damage have been shown to be very varied in their effectiveness. These techniques are often found to be very effective in laboratory and cage trials, but less effective in the field due to practical problems such as persistence (the chemical soon washes off) and presentation of treated bait. The greatest barrier to their use is legislation; only one chemical is licensed for use as a bird repellent in the UK (aluminium ammonium sulphate).
- There is growing interest in using fertility control to manage wildlife and associated conflicts. Overseas, the application of Nicarbazin (a bird-specific oral contraceptive) has been reported to have reduced the productivity in captive pigeons and the size of feral urban populations. Elsewhere, evidence for population-level effects is equivocal. In the UK, no fertility control chemicals are licensed for use in wild birds.
- Exclusion techniques (nets, covers, wires) have generally been evaluated as very effective in reducing avian crop damage. Netting is often recommended as the only technique that is consistently effective in preventing bird damage. The greater the degree of exclusion, however, the more expensive the technique is. For this reason netting tends to be restricted to high value crops.

- Prior to the widespread introduction of oilseed rape into the UK, woodpigeon numbers were naturally controlled by winter starvation with shooting an ineffective method of population control as it simply removed the 'doomed surplus' thereby reducing competition for resources and facilitating greater over-winter survival.
- However, since the large-scale planting of autumn-sown oilseed rape and thereby the removal of over-winter starvation as a constraint on population numbers shooting now has the potential to reduce local woodpigeon numbers. The effectiveness, however, will be dependent on factors such as the scale of immigration into the area and the strategic nature of the shooting. Whilst research indicates that shooting during the summer has the potential to have a far greater effect on woodpigeon numbers than winter shooting, the majority of shooting has traditionally been undertaken during the winter.
- An NFU/BASC nationwide survey showed that farmers regarded shooting as the most effective means of crop protection. Of those growers undertaking shooting, 75% rated its effectiveness as moderate to high; reported by the survey as markedly ahead of the other main protective measures bangers and scarecrows (although 68% reported bangers to be moderately or highly effective).
- The strategy with which shooting is traditionally undertaken (concealed gunmen), however, is not consistent with maximising its deterrent effect but with maximising the sporting aspect and/or the number of woodpigeons killed. For any pest-resource conflict it is important that the effectiveness of pest control should be evaluated in terms of damage prevented and not the numbers of animals killed. The deterrent effect of shooting can be maximised by reinforcing the presentation of scaring stimuli with unpredictable episodes of shooting to kill.
- Bird management advice advocates that scaring techniques should be optimised by targeting deployment relative to the temporal and spatial scale at which damage occurs. For example, delaying actions until the vulnerable period of the crop cycle or targeting efforts at the vulnerable section of crop.
- A recurring theme in the mitigation of crop damage by avian pests is the necessity for an integrated management strategy (IMS). Such an approach advocates where possible choosing fields least likely to be subject to woodpigeon damage, and combining and interchanging a suite of spatially and temporally unpredictable

scaring techniques reinforced with shooting and supplemented with habitat-based and exclusion-based techniques. The specific nature of any IMS will be site and context dependent.

- A number of options are currently available to incorporate into an IMS. These include the adoption or expansion of existing effective practices (e.g. exclusion, planting patterns, sacrificial crops); or their refinement in terms of their nature, mode of deployment and strategic targeting (deterrents); a mixed shooting strategy that attempts to maximise the effects of both shooting to deter woodpigeons from crops and shooting to reduce their number; nest and egg control; and cooperation between growers so that control is targeted at the landscape-scale. Further options require the evaluation of some novel techniques.
- The development of an economically viable IMS, however, depends on accurate information on the relative costs of crop damage and the efficacy and cost-effectiveness of mitigation measures. At present, there are significant gaps in knowledge that constrain identification of the 'optimum' strategy.
- A framework for the development of a strategic woodpigeon management plan is presented that involves: evaluating the damage, setting management objectives, selecting and implementing specific damage mitigation measures, monitoring and evaluating the outcome, and adjusting the approach as appropriate.
- Further research is encouraged to gain a better understanding of the interactions between woodpigeons and the crops under consideration and inform the development of an optimum IMS: (i) a national questionnaire survey of growers, (ii) investigation of woodpigeon use of habitat and movements and of their interactions with crops and response to management, (iii) evaluation of the magnitude, timing and costs of damage to crops at the level of the individual field, (iv) field evaluation of avian management techniques to minimise crop damage – the refinement of existing techniques and testing of novel techniques, (v) refinement of best-practice advice based on the preceding empirical investigations.

Financial Benefits

The development of an optimal economic management strategy to mitigate woodpigeon impacts depends on accurate information on the relative costs of crop damage and on the efficacy and cost-effectiveness of mitigation measures. This requisite information, however, is either not available or has not been evaluated in the context of current woodpigeon populations and agricultural practices.

Action Points

In the immediate term, in order to mitigate the impacts of woodpigeons on crops a number of proposals are available for growers to consider:

- Consider the topography and locate susceptible crops away from vulnerable areas (e.g. adjacent to woodland, tree lines or in isolated fields).
- Consider expanding the area of crops under cover (e.g. poly-tunnel, net, fleece) or prolonging the duration over which crops are covered. This needs to be weighed against any potential risks of reduced yield, reduced produce quality or increased disease associated with covering.
- Investigate alternative materials for covering or the mode of deployment of covers that might mitigate the associated risks of reduced yield, reduced produce quality or increased disease.
- Use sacrificial crops located away from vulnerable fields; ensuring that sufficient resources are available throughout the vulnerable crop period. Strips of decoy crop e.g. kale or OSR at low density along the margins of fields near woods etc. can also be beneficial.
- Ensure that deterrent techniques are deployed according to best practice guidelines, i.e. unpredictable, threatening, reinforced and/or switched with alternative deterrents, so that habituation is delayed.
- Deploy an integrated management strategy that incorporates different mitigation techniques, i.e. deterrents, exclusion, habitat management, planting regimes, sacrificial crops and shooting.

- Deploy a mixed shooting strategy that incorporates overt shooting (highly visible shooters) associated with visual cues to maximise the scaring effect and the numbers of birds deterred from fields, and covert shooting (concealed shooters) to reduce woodpigeon numbers; the latter concentrated during the summer rather than the winter.
- Consider the control of nests and eggs to suppress local woodpigeon breeding success and population recruitment.
- Coordinate management activities with neighbouring growers so that control is undertaken at the landscape-level.