Annals of Applied Biology ISSN 0003-4746

RESEARCH ARTICLE

A review of invertebrates and seed-bearing plants as food for farmland birds in Europe

J.M. Holland, M.A.S. Hutchison, B. Smith & N.J. Aebischer

The Game Conservancy Trust, Fordingbridge, Hampshire, UK

Keywords
Agriculture; arable weeds; bird diet; conservation; invertebrates; passerines; seeds.

Correspondence
J.M. Holland, The Game Conservancy Trust, Fordingbridge, Hampshire SP6 1EF, UK.
E-mail: jholland@gct.org.uk

Received: 12 May 2005; revised version accepted: 24 November 2005.

doi:10.1111/j.1744-7348.2006.00039.x

Abstract

Dietary information was reviewed for 22 bird species typically found in farmland areas across Europe using 100 references from the UK and other European countries for which quantitative data were presented. The number of studies and degree of taxonomic resolution available varied considerably between the species and, for some, dietary information was only available prior to agricultural intensification and may be unrepresentative of current feeding habits. Consequently, some caution is required in interpreting the results because of the different methods of data collection between the studies and the biases in analytical techniques for prey detectability. Food availability was rarely quantified in the study areas, and diet may have reflected availability or preference. Plant families and invertebrate orders were ranked in their importance separately for adult diet in the breeding and nonbreeding seasons and for chicks. The most important plant families overall were Poaceae, Polygonaceae, Caryophyllaceae, Cruciferae, Compositae, Chenopodiaceae and Labiatae, although the last two were unimportant for chicks. A number of key species were also identified. Similarities in dietary preferences were observed among Fringillidae (finches) and members of the Columbidae (doves and pigeons). Fringillidae and *Carduelis cannabina* (linnet) were associated with plants that occur in seminatural habitats, while *Emberiza citrinella* (yellowhammer), Phasianidae (partridges) and Columbidae were shown to be more closely associated with plants of agricultural environments. The most important invertebrate orders overall were Coleoptera adults, Hemiptera adults, Arachnida, Lepidoptera larvae/pupae, Diptera adults, Lepidoptera adults, Diptera larvae/pupae and Hymenoptera adults. During the nonbreeding season, a smaller number of invertebrate taxa were important. For adults in the breeding season and for chicks, there were 10 families of invertebrate that were important for four or more bird species (Aphididae, Carabidae, Chrysomelidae, Curculionidae, Elateridae, Formicidae, Scarabeidae, Staphylinidae, Tenthredinidae and Tipulidae). In the nonbreeding season, Curculionidae and Lumbricidae were important in the diet of three species. A few species exhibited a narrow diet range, selecting invertebrates from only one or two families. Similarities in dietary composition were observed among closely related bird species, while that of chicks and adults sometimes differed.