Introduction

Both introduced and native bird species play important ecological and social roles in production landscapes. Economic benefits stem from birds that control pasture and crop pests, and many farmers and growers appreciate native species such as tui (Prosthemadera novaeseelandiae), wood pigeons (Hemiphaga novaeseelandiae), and fantails (Apteryx capiteous) in farmland. Overseas food market chains and their customers are increasingly wishing to be assured that sustainable agriculture is practiced by those that supply from New Zealand farms has been produced in an ecologically sustainable way that supports other plants and animals in the farm landscape as well as the agricultural biodiversity that directly assists production.

In New Zealand there is currently very little information available on the ecology or social roles of bird communities in production landscapes. This study forms part of a larger project, the Agriculture Research Group on Sustainability (ARGOS), which is investigating the social, economic and ecological sustainability of New Zealand Production landscapes. The specific research question of this part of the project was:

- What impacts do alternative orchard production systems have on bird communities?
- What knowledge do growers have of bird communities on their orchards and how does this compare with information from formal scientific surveys?

Methods

This study was conducted on 36 New Zealand kiwifruit orchards located in the Bay of Plenty (n = 30 orchards) and Bay of Islands (N = 3) in the North Island, and Methwika (n=3) in the South Island. The orchards were arranged in clusters of three, matched for geology, climate, and location. Each cluster contained a KiwiGreen Hayward (Green), KiwiGreen Hort 16A (Gold) and KiwiGreen Hayward Organic (Organic) orchard. In summer 2004/2005, bird community surveys were conducted on all orchards. A team of four observers recorded all birds seen or heard in a 5 minute period at between 3-15 randomly chosen points on each orchard. Comparisons were made between the bird communities present on Green, Gold and Organic orchards (termed farming systems in this study).

The frequency at which different species were recorded in the surveys was compared to grower awareness of birds on their orchards, as indicated by the numbers of growers that noted each species during sociological interviews.

Results

The most commonly recorded species in the orchards were non-native, including song thrush (Turdus philomelos), blackbird (Turdus merula) house sparrow (Passer domesticus), chaffinch (Fringilla coelebs) and Indian myna (Acridotheres tristis). However, some native species were commonly recorded on the orchards, including fantail (Acanthiza) kingfisher (Halcyon sancta 5%) and silvereye (Zosterops lateralis: 31% of orchards. Log total bird count was significantly higher on organic orchards than on either Green (F1,34 = 8.31, p = 0.003; r2 = 38.29%), Gold (F1,34 = 8.70, p < 0.001; r2 = 40.54%) or Green (F1,34 = 8.70, p < 0.001; r2 = 39.41% (Figure 1). There was a significant positive relationship between the proportion of orchards that birds were recorded on during the surveys and the numbers of times growers mentioned the same species in the interviews (F1,34 = 25.36, p = 0.001; r2 = 39.41; Figure 3).

Conclusions

A number of valued native invertebrates (fantail and silvereye), nectarivores (tui) and frugivores (kereru or wood pigeon) species occurred on the orchards. Growers had high awareness of the full range of species present on their orchards, and an acknowledged appreciation of native species. There were differences in the bird communities found on Gold, Green and Organic orchards in the study, with significantly higher abundance and proportions of native species present on Organic orchards. The comparison between grower responses and survey results illustrates one of the strengths of the ARGOS project, where growers deep qualitative knowledge of their environment is supplemented by more focussed quantitative information from the scientific surveys.

Reference


www.argos.org.nz