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BIRD PROBLEMS IN NEW ZEALAND—METHODS OF CONTROL

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ABSTRACT: New Zealand horticulturists are experiencing increasing damage to a variety of crops from a number of introduced bird species. With the advent of the increasing problem there is a need for carefully planned control operations most of which, by necessity, will be carried out by the growers themselves. This means that a variety of baits and toxins is currently being evaluated for control purposes. Growers are being trained in the use of those toxins as well as how to get more effective use from a range of bird-scare devices. Control agencies continue to carry out control of certain bird species and monitor bird damage where possible.

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INTRODUCTION

Bird damage to horticulture, viticulture, and general cropping is becoming an increasing problem in New Zealand. The steady increase in damage in recent years is due to major diversification into horticulture and viticulture on land which in the past was used for conventional pastoral farming. This diversification has meant that large shelter belts have been established; their associated microclimates, combined with an increase in buildings, provide birds with warm shelter in the winter and ideal nesting sites. The additional houses and people associated with this diversification have created added food sources.

Natural bird mortality during winter months is drastically reduced because they are now able to feed on newly planted crops in August - September; a variety of berry fruit September - November; nashi (Asian pears) December - February; grapes and a variety of stone and pip fruits February - April/May; and persimmons and late apples May/July. This does not include other food sources such as vegetables, grains, other fruits, household scraps, invertebrates and (horse, stock, and poultry food).

Another major change is that pastoral farmers no longer use DDT for control of grass grub. When DDT was being used large numbers of some of the pest bird species were controlled through feeding on the dead and dying invertebrates.

BIRD SURVEYS

Since 1976 an annual national survey of the rook (*Corvus frugilegus*) has been carried out by control agencies. They count during the breeding season all nests in the known rookeries in NZ. Throughout the year any sightings of rooks outside their known range is recorded. All rookeries are individually recorded, by map co-ordinates, type of tree used, and number of nests, and the computer records are updated annually. All control operations are documented and any accidental killing of nontarget species is recorded. This allows rook population changes in NZ to be accurately monitored.

Over recent years bird surveys have been carried out in an attempt to assess the effect birds are having on horticulture and viticulture. In 1987 a postal survey of all grape, nashi, persimmon and cherry growers in NZ was carried out. This was an attempt to qualify the results of earlier surveys, in particular one carried out in 1967 by Dawson & Bull (1969) which showed grapes were being extensively damaged by starlings, mynas, white eyes, sparrows, and blackbirds.

The results of the postal survey were as follows: Out of 133 grape growers who responded, 90% experienced some degree of damage. Their estimated loss per productive hectare was NZ\$332 or an estimated total loss of NZ\$517,000. As only 28% (5,636 hectares) of the total grape growing area in NZ (1985 estimation) was surveyed, damage nationally could be a staggering NZ\$1.87 million. To this should be added the cost of control NZ\$811,000, bringing the total to in excess of \$2.68 million. If this loss was then converted to wine production the loss could be in the \$8 to \$10 million range. Porter & McLennan (1985 & 1987), Ecology Division, D.S.I.R., estimated the combined cost of grape damage and control in Hawkes Bay alone at NZ\$1 million.

A total of 44% of nashi growers responded; 58% had orchards in production, and 90% of these experienced damage estimated at NZ\$1,396 per production hectare. With persimmons, 70 growers responded, and 60% had orchards in production. Of these 88% experienced damage, estimated at \$523 per productive hectare. Both nashi and persimmons are relatively new horticultural crops in New Zealand. The cost of control varied from \$144 per hectare for grapes to \$321 per hectare for persimmons. In many cases this did not include labour.

Growers were asked to rank (in order of priority) which birds they thought were causing the damage (Table 1).

Table 1. Results of the grower survey where the growers were asked to rank bird pests in the order of their damaging importance for three fruit crops.

	Crop			Total
	Grapes	Nashi	Persimmons	
Starling	1	5	6	12
Blackbird	2	1	3	6
White eye	3	4	2	9
Thrush	4	3	7	14
Myna	5	2	1	8
Sparrow	6	6	4	16
Finch	7	7	5	19
Other species	8	8	8	24

Note: 1 = most damage 8 = least damage.

Overall, blackbirds were considered to cause most damage; starlings were the greatest threat to grapes; and mynas caused major damage to nashi and persimmons (mynas only inhabit the upper half of the North Island where most nashi and persimmon are grown). The results indicate which species are considered to cause most damage, but this data will need to be qualified by research in the future.

BIRD SPECIES AND CONTROL TECHNIQUES

European Starling (*Sturnus vulgaris*)

These were first liberated in NZ about 1862 and are now widely distributed throughout the country. The European starling is considered to be one of the major problem birds in NZ today, damaging grapes, cherries, nashi, persimmons, berry, and pip fruit, as well as crops. Due to their habit of feeding in large flocks (sometimes in excess of 1,000 birds) and the distance they are able to travel to feed (up to 30 km), they are proving difficult to control. Limited success has been achieved using alphachloralose on bait such as bread, household scraps, and dog sausage. Serious consideration must be given to using a toxin such as Starlicide if a suitable bait can be found, or treating roosts with a surfactant or toxin. As these birds also feed on invertebrates, some pastoral farmers are not in favour of controlling them.

Currently the main control strategy is to scare them off crops with a variety of scare devices or by gun shot. Starlings can be successfully scared off a crop.

Indian Myna (*Acridotheres tristis*)

Introduced into NZ about 1870, this bird is mainly restricted to the northern half of the North Island (the largest horticultural region). Although myna roosts can contain hundreds of birds, they usually feed in small groups. They can cause serious damage to a variety of crops; consume stock, pig, and poultry food; and are a real nuisance in urban areas. Alphachloralose has been used successfully to control mynas. It has been mixed with paste, margarine, or dripping (at 2.5%) and then spread on bread, household scraps, or incorporated in dog sausage. It is important to pre-feed regularly before using the toxic bait. For a quick removal of these birds a 4% alphachloralose loading is recommended. Control operations have drastically reduced mynas in some areas with kills of 300 to 400 birds not uncommon. Starling box traps are an effective method of control as mynas will readily use another bird's nest. Trials using myna distress calls have been carried out but to date these appear to attract the birds. Currently models with outstretched wings displaying the prominent white spot are being tested to see if they will be an effective deterrent. This is similar to trial work carried out by Inglis and Isaacson (1987) in England on wood pigeons.

The myna is one species that most people, including bird lovers, do not mind being controlled because of their detrimental effect on other bird species.

White eye, Silver eye or Wax eye (*Zosterops lateralis*)

Self-introduced into NZ before 1850, these birds are now abundant throughout most of NZ. They often feed on fruit damaged by other birds as well as cause damage to ripening grapes and persimmons. Control of these birds is mainly by trapping or shooting, although alphachloralose paste or

dripping used in the winter will reduce the population. More work needs to be carried out on the use of draw crops, i.e., nectar-producing plants, to distract these birds from fruit crops.

Blackbirds (*Furdus merula*)

Introduced into NZ in 1862 and now spread throughout the country, these birds were damaging fruit by 1871. They are one of the major problem species today, damaging a wide variety of fruit and spreading fleshy species of weeds. Unlike a number of other bird species, blackbirds are not easily scared from orchards: they generally hide in cover until the danger has passed. A control measure that appears to work well is alphachloralose paste on small bread baits, pieces of dripping, apple, and household scraps, which are then placed close to the edges of cover. Modified rat traps have also proved successful. In some instances in excess of 3,000 birds have been trapped in vineyards. To successfully control the generally sedentary blackbird, operations must be carried out during most of the year.

Thrush (*Turdus philomelus*)

Introduced in 1860 and now spread throughout the country, the thrush is considered to be one of the major pest species in orchards where they damage berry fruits, cherries, grapes, nashi, etc. Like blackbirds, they live within the confines of orchards and vineyards and when frightened move into cover. Control of these birds is the same as for blackbirds: alphachloralose paste on small pieces of apple, bread, and household scraps placed close to shelter. Modified rat traps are also effective.

Finches, including Chaffinches (*Fringilla coelebs*)

Greenfinch (*Corduelis chloris*)

Both the above species were introduced into NZ in the 1860s and are now spread throughout the country. They cause some damage to newly planted crops (in particular cereals) and damage fruits such as apricots, cherries, peaches, plums, and berry fruits. Alphachloralose wheat and shooting are the control methods used on these birds.

Sparrow (*Passer domesticus*)

Introduced in the 1860s the sparrow is now widespread throughout NZ. It is one of the major problem species with regard to cereal crops damaging both standing grain and newly planted crops. It also damages fruit and vegetable crops and is a nuisance in urban areas both in factory food preparation and in public places. Control is effectively carried out with alphachloralose wheat, barley, and paste at 2.5% w.w. as well as alphachloralose on breadcrumbs and other bait material. Avitrol was tested on these birds and found to work quite successfully in newly planted grain crops.

Pigeons (*Columba livia*)

Control of these birds is mainly confined to urban areas where they are a problem in public places-particularly on buildings where their droppings cause problems and in odd instances block down-pipes and cause flooding. Pigeon numbers are increasing in some rural areas, particularly where there are cereal and pea crops. Alphachloralose wheat and peas and shooting are used to control pigeons.

Rooks (*Corvus frugilegus*)

These birds are a problem in a number of cropping areas of NZ. They cause damage to various emerging crops such as maize, pumpkins, potatoes, peas, etc., as well as consuming large numbers of walnuts. At times they cause severe damage to areas of pasture when probing for invertebrates. All major control operations are carried out by control agencies using DRC 1339 on a variety of baits. Prefeed bait is laid on bait lines before daylight. When sufficient birds are drawn to the bait the toxic bait is laid. Sheep carcasses have been used successfully to draw the rooks to the bait area. Some farmers carry out limited control by shooting the rooks but this tends to disperse them to other areas.

Blackbacked Gulls (Dominican gull or *Larus dominicans*)

A number of control operations have been carried out on these birds at roosts in close proximity to airports or in environmentally sensitive areas where they damage rare plants. Effective control is gained by using alphachloralose in dripping or margarine at 4%. This is followed by the destruction of nests and young birds, and the shooting of the remaining birds.

TOXINS CURRENTLY USED

New Zealand growers do not need a license to legally purchase alphachloralose wheat, barley, and peas at a concentration of 2% to control problem birds on crops. A licence must be obtained before alphachloralose can be used at a strength greater than 2%. As a number of pest bird species are not seed eaters, we have developed a new product in the form of sweet, oil-based alphachloralose paste packed in easy-to-use 500-gram plastic tubes. This paste can be readily spread on or mixed into a variety of baits such as bread and pet food. When using it with bread, the paste is spread on it like butter, and sandwiches made which are then cut into squares. To increase the loading, the bread can be lightly microwaved before being spread again with more toxic paste. Nontoxic prefeed paste is also available for use prior to the toxic paste application. This is the only toxin growers should use; however, organophosphates such as phosdrin are used illegally to inject reject fruit. A dangerous practice! Pest control agencies have staff licensed to use alphachloralose and Starlicide.

Alphachloralose

This is used on a variety of baits either by suspending the toxin in margarine or dripping and applying to bread and other baits, or by applying the powder to breadcrumbs or a similar bait.

DRC 1339 (Starlicide)

This toxin can only be applied by pest control agency staff. The toxin is mixed in a starch mix or dripping and applied to a variety of baits (bread, maize, walnuts, crushed oats, and brown beetles) for rook control.

EXPERIMENTAL POISONS BEING TESTED

DRC 2698 (Cat)

This toxin has been tested on a number of occasions as a possible replacement for DRC 1339 (Starlicide). The results to date show that when applied at the same toxic level as DRC 1339, it appears to kill much quicker and the birds

are not spread over such a wide area. Further trial work on rooks will continue.

Fenthion

This toxin has been experimentally used in a grease-type mixture at 11% for rook control. The toxin was spread around the edges of the nest with the result that birds landing on the nest to feed the young were poisoned. One problem was to find a suitable paste; another was that if the young came into contact with the toxin and died, the adults did not return to the nests. The nests are 30 to 35 metres above the ground so staff was lowered to the nests from a helicopter. More experimental work should be carried out on this method as specific birds are targeted. This toxin added to a petroleum paste has been tested on birds perching on buildings.

Rid-A-Bird perches with fenthion

These are now registered in NZ for experimental use and are currently being tested, mostly inside buildings with bird problems. If they prove successful, full registration in NZ will be applied for.

Avitrol

Some limited trial work has been carried out with this toxin on grain. To date this has proved inconclusive; however, further evaluation will be made of this material.

GROWER EDUCATION

Steps are being taken to educate growers to use more wisely the various scare devices available. In the past, large amounts of money were spent on a variety of scare devices. These were put in crops and often left in the same position for a year. In some cases one propane gun was expected to protect 4 to 5 hectares of crops.

Currently a number of grower groups are organising bird seminars around NZ in an effort to educate the growers on better use of available devices. These seminars cover the positioning of scare devices (including the need to move them regularly) and their usefulness. Also covered is the need to supplement scare devices with other apparatus, control methods, and the importance of habitat manipulation. I am involved in the production of a number of booklets designed to make growers more knowledgeable of the birds they are trying to control, as well as giving information on how to use bird-scaring devices a lot more competently. It does appear that many manufacturers and retailers of scare devices fail to give sufficient information on how to use the devices effectively.

In the survey carried out in NZ, grape growers were asked to comment on which method they considered to be most productive. The response indicated that the methods employed were varied but can be categorized into killing (poisoning - shooting), exclusion (netting - bagging), repelling (sprays), and scare devices (gas guns - fluttering tapes - kites - balloons, etc.). The most popular methods employed were shooting and scaring with a gas gun; a large number of growers used these methods. Their ranking of success indicated that sprays were the most successful, followed by kites, balloons, gas guns, reflecting and humming tapes, and shooting. There were too few other methods reported to allow confidence in any calculated effectiveness rating. With Mesurol no longer available for spraying on crops and no

others in the offing, research must be directed at improving scaring devices and teaching growers to use them correctly.

OTHER CONTROL METHODS

Other control methods used to reduce bird numbers in orchards and vineyards include shooting (mainly with shotguns) and trapping (particularly birds with territorial habits such as blackbirds and thrushes). Modified rat traps prove very successful if placed close to shelterbelts and maintained over long periods of the year. Some vineyards have caught up to 3,000 birds annually using this method. Another trap that works well on starlings and mynas is the modified starling nest box. To date the modified Australian crow trap is not effective when used on starlings in NZ.

FUTURE OF BIRD CONTROL IN NEW ZEALAND

With the prospect of increasing bird problems there is a need to develop more control strategies which will include a wider variety of baits and possibly more toxins. For starling control, serious consideration must be given to developing suitable bait to use with an effective toxin such as DRC 1339. It is likely that starling roosts will need to be treated either

with a surfactant or a contact toxin. The nature of the country where the roosts are means application of toxin may have to be from a helicopter rather than from the ground. Growers will have to increase their efforts to control birds and utilize existing bird-scaring devices more effectively. Consideration must also be given to some habitat manipulation.

Whilst growers and control agencies accept the need for bird control a large percentage of the general public in NZ are not in favour. These people are becoming more vocal. When dead birds are seen by the public after a control operation, the media join the fray. This compounds the problem and puts pressure on those involved in bird control to take more care. Realistically many crops in New Zealand cannot be protected from birds by netting, therefore bird control is here to stay.

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