CROP DAMAGE ALLEVIATION PROGRAM

- PRAIRIE PROVINCES EVALUATION -

1972

S.C. Woynarski
Environment Canada
Canadian Wildlife Service

April, 1973

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Introduction

Ducks trampling swaths and eating unharvested grain cause serious losses to farmers in the Prairie Provinces. The problem is associated with the number of ducks present in localities in late summer and early autumn, and with climatic conditions during planting and harvesting. Weather that delays planting in the spring or that extends harvesting, increases the vulnerability of swathed grain crops to waterfowl damage. When waterfowl populations are high and weather conditions unfavorable, damage can be widespread and of major importance to the grain industry.

The amount of damage fluctuates, varying from province to province, and from year to year. In general, significant damage by waterfowl began in the late 1940's and early 1950's. Severe damage occurred in 1951, 1952, 1958, 1959, 1964, and from 1968 to 1971.

In the past 20 years, techniques to prevent or minimize damage to grain crops have included use of scaring devices including automatic noisemakers and shooting, feeding projects including planting of special crops to attract and hold ducks. The special feeding crops have been an effective control near large marshes or waterfowl concentration areas, especially when combined with the use of scaring devices on nearby unharvested crops.

Since the serious damage of the early 1950's, Manitoba has had an active crop protection program centered around feeding ducks and patrols by Conservation Officers in late summer and early autumn to warn farmers of impending depredations. The province also helps farmers to scare ducks by providing assistance in constructing and operating scaring

devices. Crops have been planted near major waterfowl concentration areas since 1970.

The Saskatchewan Government initiated a Wildlife Damage Insurance program in 1953, after several years of severe depredations. Administered by the Saskatchewan Government Insurance Office, it is financed by a $1.00 impost of provincial hunting licences and by the annual insurance premiums paid by farmers. The premium rate is two per cent (2%) of the coverage up to a maximum compensation of $25.00 per acre.

Revenues exceeded expenditures ten times during the 18-year period, 1953 through 1970. The accumulated surplus was depleted in 1970, when claims paid amounted to $426,000. The program had a deficit of about $350,000 in 1971, which was made up from general provincial revenues.

The province began a program of planting crops for feeding birds on crown land experimentally in 1958 and operationally in 1970; the Canadian Wildlife Service has maintained planted crops for feeding birds at the north end of Last Mountain Lake since 1961. All crops have been successful in reducing damage to adjacent commercial farms.

Alberta established a Wildlife Damage Fund in 1961, financed by a $3.00 Wildlife certificate which is prerequisite for hunting licences sold in the province. A farmer may claim for compensation from the Alberta Hail and Crop Insurance Corporation, on payment of an adjustment fee of $25.00. Compensation for waterfowl damage is a maximum $15.00 per acre, or one-half of the crop value, whichever is lower.

In 1970, Alberta began a three-year experiment to control damage by ducks. The objectives of the study were to determine the effectiveness

of different control methods. Two areas were selected in the northwest part of the province. One area near Falher was a control for the experiment, while the other near Grande Prairie was used to test the effectiveness of feeding ducks on dry crops, flooded crops, and a bait station, all associated with a scaring program.

In 1972, agreements were negotiated between the governments of Canada, Alberta, Saskatchewan and Manitoba, with the objective of reducing losses to farmers caused by migratory birds damaging grain crops. In total, these agreements provided $1,000,000 for compensation and $796,000 for design and operation of prevention programs on a 50:50 cost sharing basis.

Program Methods in 1972

The crop damage alleviation program, originated in 1972 under federal-provincial cost-sharing agreements, had two major and two minor components. The major components were payments made directly to farmers by provincial agencies and damage control operations undertaken by both federal and provincial staffs. Minor components were evaluations made of the major components by provincial and federal staffs and public information. The information program component will only be mentioned briefly here, as the major outputs were to design a public information proposal for consideration by the contracting parties and to complete publication of a booklet commissioned earlier by the Canadian Wildlife Service.

A new program of direct payments to farmers was instituted in Manitoba, which was eligible for cost-sharing under the federal-provincial agreement. In Saskatchewan, existing insurance offered by the Saskatchewan

Government Insurance Office was eligible for cost-sharing under the agreement. Similarily in Alberta, the existing compensation for wildlife damage offered by the Alberta Hail and Crop Insurance Corporation was eligible for cost-sharing. The new Manitoba payments are derived from compensation offered by the Manitoba Crop Insurance Corporation. Payments were to a maximum of $15.00 per acre, with a $25.00 fee for each section examined, refundable if the claim was valid.

Control operations in Manitoba were expanded and funded as a result of the 1972 agreement. Twenty-nine lure crops were operated, associated with a scaring program. In Saskatchewan, existing lure crops were operated by Department of Natural Resources staff. The lure crops were located near Tobin Lake, Waterhen Marsh, Deifenbaker Lake, Eyebrow Lake and Condie. All were eligible for cost-sharing under the new agreement. The costs for crops planted by the Canadian Wildlife Service for feeding migratory birds at Last Mountain Lake, Stalwart and Bradwell were funded entirely by C.W.S. In Alberta, the existing experimental crop damage control operations at Grande Prairie and bait stations established at Beaverhill Lake were supported under the terms of the agreement. In addition, a bait station near Whitford Lake was established. The crop planted by C.W.S., near St. Paul, Alberta, for feeding migratory birds was not included for cost-sharing.

Lure crop evaluation studies were conducted in Manitoba, Saskatchewan and Alberta in 1972. The objectives of these studies were:

1) To estimate concentrations of waterfowl on specified major staging areas;

2) To determine use made of feeding areas provided for waterfowl;

3) To relate the costs of providing feeding areas to number of migratory birds accommodated in proportion to numbers of migratory birds in the vicinity.

The Manitoba evaluation study involved collection of data on the use of special crops by migratory birds. Limited evaluation can be made of the effectiveness of the control program because no compensation data or information on magnitude of crop loss from waterfowl exist for previous years, and few claims were made in 1972. Seven of 29 lure crops in operation were studied and evaluated by weekly aerial census of lure crops, twice weekly ground transect counts near lure crops, counts of birds on lure crop. A weekly aerial census was done of all major staging areas in the province. The data were collected by Conservation Officers, who had other work and were not specifically assigned to the crop damage control program. The data were thus collected on a time-available basis.

Two lure crops were intensively studied in Saskatchewan. The system of data collection was similar to that in Manitoba. Data were collected by C.W.S. with assistance from the Department of Natural Resources. The insurance claims data cannot be used to estimate total damage. The data only show damage intensity in specific locations. Farms near Eyebrow Lake and Waterhen Marsh are known to be chronically affected by waterfowl damage; yet very few insurance policies have every been purchased in these areas.

The Alberta study in 1972 was a continued evaluation, the final

year of a three-year experimental study into crop damage alleviation by the use of feeding areas (crops), bait stations, and a scaring program. In Alberta, the compensation claims data from 1964 to the present were available for comparison. A test (treated) and a control (untreated) area were used to make comparisons to test the effectiveness of a control program and of various control methods. The study had been designed in 1969 and 1970 as an experiment to which staff were assigned for consistent data collection.

The results reported here were compiled from data collected by regional staff of the Manitoba Department of Mines, Resources and Environmental Management, staff and contractors of Canadian Wildlife Service Lands and Surveys sections in Saskatchewan and reports prepared under the direction of Mr. T.E. Burgess of Fish and Wildlife Division Alberta Department of Lands and Forests. Records of insurance liabilities and compensation claims were provided by Saskatchewan Government Insurance Office, the Manitoba and Alberta Crop Insurance Corporations respectively.

Results

The Manitoba Crop Insurance Croporation processed twenty valid claims for waterfowl damage compensation, with a total expenditure of $5,694. The small number of claims was likely because 1972 was the first year a compensation program was offered and it was not introduced until mid-September when a large portion of harvesting had been completed. The Saskatchewan Government Insurance Office processed 650 insurance claims for crop loss from waterfowl, for a total expenditure of $544,000.

Snowfall in September in Saskatchewan and Alberta increased susceptibility of swathed crops to damage. The Alberta Hail and Crop Insurance Corporation processed 1,065 claims for compensation for waterfowl damage, with an expenditure of $509,160.

An estimated 1,339,304 bird-days were accommodated on the seven feeding areas studied in Manitoba at an average cost of 1.6 cents per bird-day (Table 1). The feeding areas evaluated were estimated to accommodate 97% of potential damage-causing birds.

Two feeding areas near Eyebrow Lake and Waterhen Marsh were intensively studied in Saskatchewan (Table 1) using techniques similar to the Manitoba study. The effect of duck damage control effort on the amount of direct payments to farmers could not be measured in Saskatchewan in 1972. Only one insurance policy was purchased in 1972 in the vicinity of Eyebrow Lake and there were no policies purchased in the vicinity of Waterhen Marsh despite a long history of complaints from farmers in those districts about duck damage. Census of Eyebrow Lake staging areas in Saskatchewan was poor in 1972 with the consequence that more birds were counted on the crops provided than on the adjacent resting areas. While the provision of feeding areas as alternatives to commercial crops is effective, there are indications as at Waterhen Marsh, Saskatchewan and Dog Lake, Manitoba (Table 1) that less than half the birds in the vicinity may be attracted to them. In such cases direct payment to farmers would be necessary to reduce the loss of commercial grain.

The prevention program in Alberta included completion in 1972 of a three year study with the following objectives:

a) To determine the cost and attractiveness of three types of

TABLE 1 - COST EFFECTIVENESS OF INTENSIVE STUDY LURE CROPS

Lure Crop Name	Bird-Days on Lure Crop	Cost of Project	Cost Per Bird-Day	Bird-Days on Staging Area	% Bird-Days from Staging Spent on Lure Crops
MANITOBA					
Delta Marsh	176,192	$ 3,109	1.8¢	65,751*	268.8
Big Grass Marsh	268,865	2,147	.8¢	276,255	97.3
Dog Lake	49,742	1,137	2.3¢	114,023	43.6
Dauphin Lake	218,905	3,048	1.4¢	235,067	93.1
The Pas[1]	625,000	11,618	1.9¢	685,657	91.2
Pooled	1,338,704	21,059	1.6¢	1,376,753	97.2
SASKATCHEWAN					
Waterhen Marsh	46,319	NIL**		138,061	33.5
Eyebrow Lake	400,000	3,200	0.8¢	209,188*	191.2
Pooled	446,319	3,200	0.7¢	347,249	128.5
ALBERTA					
Grande Prairie	2,083,200	38,135	1.8¢	2,711,103	76.8

[1] Three lure crops were operated at The Pas. They were evaluated as a single unit.

* Low count.

** Operating costs were covered by a share-crop arrangement whereby the landowner operated a lure crop on crown land in return for free use of other crown land.

feeding sites: dry crops, flooded crops and bait stations;

b) To measure combined cost of lure sites, scaring efforts and direct payments to farmers in relation to direct payments alone.

The comparisons were made on a test area near Grande Prairie on which damage prevention treatments were used, and on a control area near Falher on which only direct payments to farmers were made. Data were obtained on amount and type of crop cover, weather, harvest chronology, and waterfowl populations. As those factors were quite similar for both test and control areas, changes in duck damage would probably be due to the feeding and scaring activities. Data were also gathered on cost of feeding methods and bird use of feeding sites.

In the Grande Prairie experimental area 2,083,200 bird-days were accommodated on feeding areas which was estimated to be 77% of the potential damage causing ducks (Table 1). The average cost of feeding those birds was 1.83¢ per duck-day. Alberta also operated two bait stations near Beaverhill Lake, and one bait station near Whitford Lake.

Duck damage in the Grande Prairie area in 1972 was only $9,929 or twelve percent of the six-year mean of $81,988 of total farmer loss as measured by crop insurance adjusters. The duck damage in the control area was $70,350 or 199 per cent of the six-year mean of $35,323 for that area.

Assuming that Falher and Grande Prairie are comparable the cost of damage to farmers near Grande Prairie in 1972 in the absence of the damage prevention project was estimated at 199 per cent of the six-year mean or $163,156. Similarly the cost to the farmer in the

absence of the damage prevention project at Beaverhill-Whitford was estimated to be $90,800.

Savings to farmers from crop damage control techniques near Grande Prairie and at Beaverhill and Whitford Lakes were $153,247 and $69,200 at costs of $42,510 and $37,600 respectively (Table 2). Costs to taxpayers without the damage control effort are estimated to have been $71,797 and $42,000 respectively. The Grande Prairie damage control effort was clearly more successful in term of savings to farmers. At Beaverhill and Whitford Lakes the reported loss to farmers of $21,600 was about equal to the costs of control $27,600 (Table 2). Indications from Manitoba and Saskatchewan also suggest that with the present level of knowledge of damage control projects that direct payments to farmers must be about equal to control costs for current programs.

Burgess (1973) has determined the cost of damage control projects, area of effectiveness of a project, and compared it with compensation payments for chronic damage areas. This comparison has shown that 37 feeding projects can be operated, with 50 per cent of the cost borne by the federal government, at less than $15 per acre of commercial crop potentially affected by damage. Thus costs to the farmer and the provincial treasury would be reduced. Those projects in Alberta would control about 51% of the mean crop loss. The 37 damage control projects are estimated to cost $295,365 in total to operate.

A comparison of costs in sample areas in each province (Table 3) was obtained from the total data collected for each province. The Alberta samples were systematically selected and therefore, the results are most comparable. In Saskatchewan and Manitoba, the samples were not clearly

TABLE 2 - PROJECT EFFECTIVENESS - 1972

		Grande Prairie	Beaverhill/ Whitford
1.	Cost of project	$ 38,135.00	$27,600.00
2.	Compensation paid	$ 4,375.00	$10,000.00
3.	Total government cost (project plus compensation)	$ 42,510.00	$37,600.00
4.	Estimated farmer loss prevented	$153,247.00	$69,200.00
5.	Farmer loss reported	$ 9,929.00	$21,600.00
6.	Per cent compensation paid	44	46
7.	Estimated farmer loss in absence of project	$163,156.00	$90,800.00
8.	Estimated government cost in absence of project (7 x 6)	$ 71,797.00	$42,000.00
9.	Benefit/cost ratio (cost in absence of project/total government cost 8 ÷ 3)	1.69	1.1
10.	Benefit/cost ratio (farmer loss prevented/project cost 4 ÷ 1)	4.02	2.5

defined natural areas but varying sized blocks in which it was thought that roughly comparable number of bird-days would be found. Unfortunately the numbers of bird-days varied widely. However the program costs per bird-day were consistently lower when damage control treatments were applied.

Discussion and conclusions

Crop damage by waterfowl can be reduced by the use of control projects composed of diversionary feeding areas associated with a scaring program. Although some of the data collection was inconsistent and difficult to analyse, it did show that feeding areas did accommodate a large number of the waterfowl in the vicinity, which would have otherwise fed on commercial crops. The evaluation has shown that control projects are effective. More information is needed on the extent to which control projects can be used and still remain less than cost of direct payments. Analysis done in Alberta indicates that shared cost damage control projects significantly reduce the cost to the farmer and the provincial treasury and that about half of the estimated total annual damage costs could be reduced. Similar analyses are needed for Saskatchewan and Manitoba.

The rapidly rising compensation costs in Alberta and Saskatchewan in the recent past and the 1972 evaluation have shown that feeding and scaring play an important role in reducing crop damage and achieving the objective of this program, to reduce losses to farmers caused by migratory birds damaging grain crops. This evaluation demonstrates a need for a method of determining the actual crop loss for all three provinces, to analyse effectiveness of control projects. The data

TABLE 3 - COMPARISON OF A TREATED AND UNTREATED AREA OF DAMAGE IN EACH PROVINCE

	ALBERTA		SASKATCHEWAN		MANITOBA	
	Treated	Untreated	Treated	Untreated	Treated	Untreated
Bird[1]-Day	2,711,103	1,200,500	400,000	165,893	276,255	27,181
Harvest Completion Date	Oct 25(80%)	Oct 25(95%)	Sep 22(90%)	Oct 13(94.8%)	Oct 11(95%)	Oct 11(95%)
Direct Payments	$ 4,375.00	$28,761.00	NIL	$37,394.00	$ 199.00	$ 1,186.00
Control Costs	$ 38,135.00	NA	$3,200.00	NA	$2,150.00	NA
Pooled	$42,509.00	$28,761.00	$3,200.00	$37,394.00	$2,349.00	$1,186.00
Cost/Bird-Day	1.6¢	2.4¢	.8¢	22.5¢	.9¢	4.4¢

[1]Mallards, pintails, geese

TABLE 4 - COST COMPARISON OF 1972 PROGRAM AND 1973-74 BUDGET*

Province	1973-74 BUDGET FORECAST Compensation	1973-74 BUDGET FORECAST Prevention	1972-73 BUDGET Compensation	1972-73 BUDGET Prevention	ACTUAL EXPENDITURE 72-73 Compensation	ACTUAL EXPENDITURE 72-73 Prevention
ALBERTA	225,000	120,000	200,000	92,000	200,000[1]	57,500
SASKATCHEWAN	250,000	268,000	250,000	186,000	250,000[1]	24,363
MANITOBA	50,000	87,000	50,000	120,000	3,829	48,848
TOTALS	525,000	475,000	500,000	398,000	435,829	130,711

* Federal share shown

[1]Actual provincial expenditure in Alberta was $310,160 and in Saskatchewan $294,000.

shown in the 1973-74 budget, would be advanced to the remaining years with adjustments being made as required and as new information may show a different trend in percentage allocation.

Manitoba indicated that they will continue feeding crop operations with expansion of program to include a few feeding stations in 1973-74. Saskatchewan has past data showing chronic crop damage areas in the province. They propose to expand control operations to these areas as manpower requirements are met. Alberta will expand their bait station operations at the rate of approximately ten projects per year, to complete estimated feasible coverage within four years.

Literature cited

Burgess, T. E., 1973. A summary of Alberta crop damage control effort with considerations for a province-wide programme. (First draft) Report to Fish and Wildlife Division, Alta. Dept. Lands and Forests, April 1973, 43 p.