

BLACKBIRD DENSITIES AND SUNFLOWER DAMAGE IN NORTH DAKOTA AND SOUTH DAKOTA: 1996-1998

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Introduction

Inter-year scale differences in estimates of both blackbird population size and damage to sunflower may obscure a relationship between annual changes in blackbird numbers and the amount of sunflower damage incurred by sunflower producers. In 1981, 1982, 1990, and 1991, population surveys were conducted at a statewide scale; however, population surveys conducted from 1995 to 1998 were done regionally. Likewise, estimates of sunflower damage caused by blackbirds were made at the statewide scale in 1979 and 1980, but thereafter were made at a local scale.

In conjunction with North Dakota State University, Wildlife Services began testing DRC-1339 avicide in South Dakota to reduce northern blackbird populations. We tested many sampling designs since the program's inception in spring 1994 attempting to associate the use of DRC-1339 to control blackbird populations with subsequent changes in the amount of blackbird-induced sunflower damage. We are currently using an intensive sampling strategy in four counties in North and South Dakota to reduce statistical variance. In this poster, we present population and damage data collected on blackbirds from 1996-1998 in Stutsman and Pierce Counties in North Dakota, and Brown and Clark Counties in South Dakota.

Methods

Breeding pairs of common grackles, yellow-headed blackbirds, and red-winged blackbirds were counted from 1996 to 1998 in five townships in Clark and Pierce Counties. Five townships in Brown County were added when we conducted the 1998 census. The number of townships sampled in Stutsman County changed from ten in the 1996 and 1997 surveys to 26 in 1998. We sampled with a 2-stage cluster design using townships as clusters and quarter sections (3 per township) as elements. Annual counts were done in May and were repeated at the same quarter sections (64.8 ha).

From 19 September - 1 October, sunflower damage assessments were done in three townships in Clark (1996-98), Pierce (1996-98), and Brown Counties (1997-98). For Stutsman County, sampling was more thorough: 14 townships in 1996 and 25 townships in 1997 and 1998. In the 1996-97 damage surveys, four fields (when available) were sampled per township. In 1998, sampling intensity per township was based on the average damage for 1996 and 1997 in each township. If it averaged <1.0%, two fields were sampled; 1.0-3.0% damage, three fields; and >3% damage, four fields. We

used 2-stage cluster sampling with townships as clusters and sections (259 ha) as elements. Each field had four sampling strata, with an equal number of rows of sunflower in each stratum. Six 1.5-m plots were randomly placed in one randomly-selected row in each stratum. Percent bird damage on the sunflower heads in each plot was measured with a template.

Results and Discussion

Over the three-year period from 1996-98, blackbird densities in the four counties annually averaged 26 ± 1.7 (SE) birds/quarter section (0.44 birds/ha, Table 1). Brown County had the highest density of blackbirds (43 birds/quarter section) in the four counties sampled in 1998 (Fig. 1). At the observed densities in the counties and at a projected recruitment rate of one offspring per bird, the local population in the four counties in late summer was 1.4 million blackbirds.

From 1996-98, sunflower damage per field averaged 2.4% ($n = 272$, SE = 0.38). In 1997, Pierce County had an average damage of >11% per field ($n = 12$), highest among the counties surveyed that year (Fig. 2). Seven (2.6%) of 272 fields sampled from 1996-98 had blackbird-inflicted damage >20%, 21 (8%) fields >10% damage, and 37 (14%) fields >5% damage (Fig. 3).

The three major blackbird species that reside in the Dakotas forage on sunflower from August until migration in mid October. This foraging apparently reduced annual sunflower production in our sampled counties from 130 million kg to 127 million kg, costing growers \$682,600 per year (@\$0.22/kg) or >\$2 million over the three-year sampling period. Assuming that 75% of the sunflower damage was caused by local birds within 18 days after anthesis, the amount of sunflower destroyed on a per bird basis was 1.7 kg per year, or \$0.36 per bird per year.

Future Surveys

To determine long-term trends in blackbird populations and sunflower damage, we will continue in 1999 our intensive sampling of Pierce, Stutsman, Clark, and Brown counties. These data may be used to measure the efficacy of various damage-management programs, to identify high-damage areas, and to establish a relationship between bird densities and sunflower damage levels.

Table 1. Annual sunflower production, bird damage (\pm SE), and blackbird densities (\pm SE) averaged from 1996-1998 in four counties of North Dakota and South Dakota

Category	Pierce	Stutsman	Brown	Clark
Damage Data				
Average ha of sunflower	14,000	55,000	19,000	4,000
Production ($\times 10^3$ kg)	20,000	68,000	34,000	5,000
Sunflower value ($\$ \times 10^3$) @(\$0.22/kg)	4,400	14,960	7,480	1,100
Fields sampled	32	203	13	24
Damage (\$/ha)	21	6	4	1
Value of damage (\$)	292,000	317,000	69,000	5,000
Damage caused by local blackbirds (\$)	219,000	238,000	52,000	3,500
Average damage (%)	6.6(± 2.2)	2.1(± 0.4)	0.9(± 0.4)	0.4(± 0.2)
Population Data				
Quarter sections sampled	45	141	15	45
Breeding blackbird numbers	82,000	236,000	298,000	88,000
Post-breeding local population	164,000	472,000	596,000	177,000
Blackbirds per quarter section	20(± 2.6)	26(± 2.5)	43(± 8.1)	27(± 2.7)

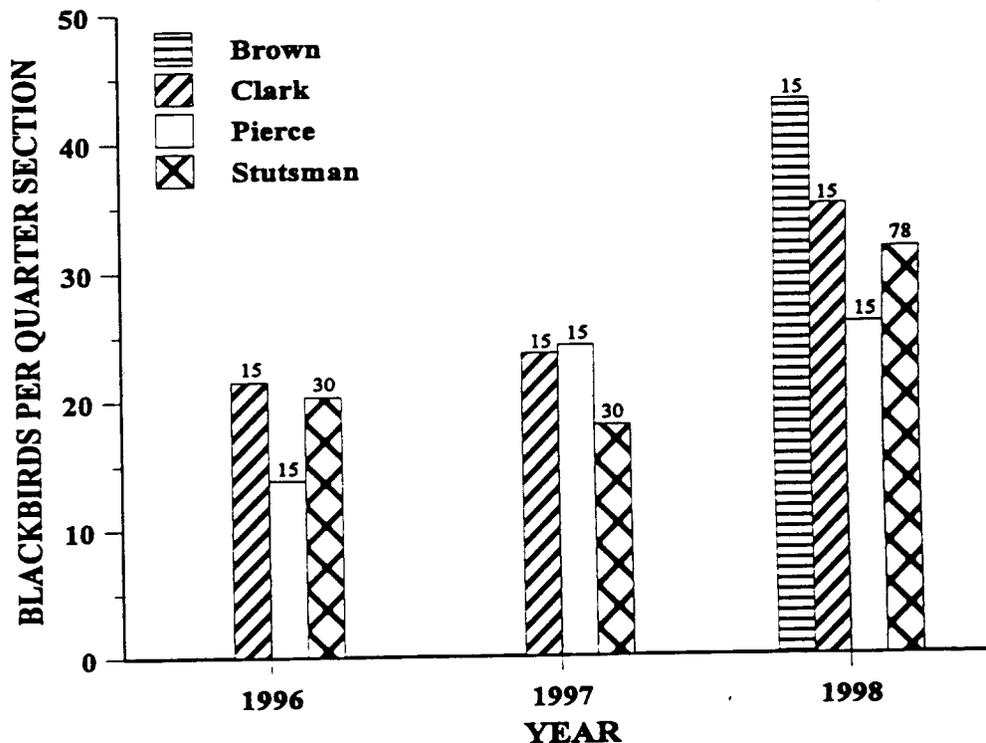


Figure 1. Densities of three species of breeding blackbirds estimated during May in Pierce and Stutsman Counties in North Dakota, and Brown and Clark Counties in South Dakota. Breeding Birds were not counted in 1996 and 1997 in Brown County. Values above bars are the number of quarter sections sampled in each county.

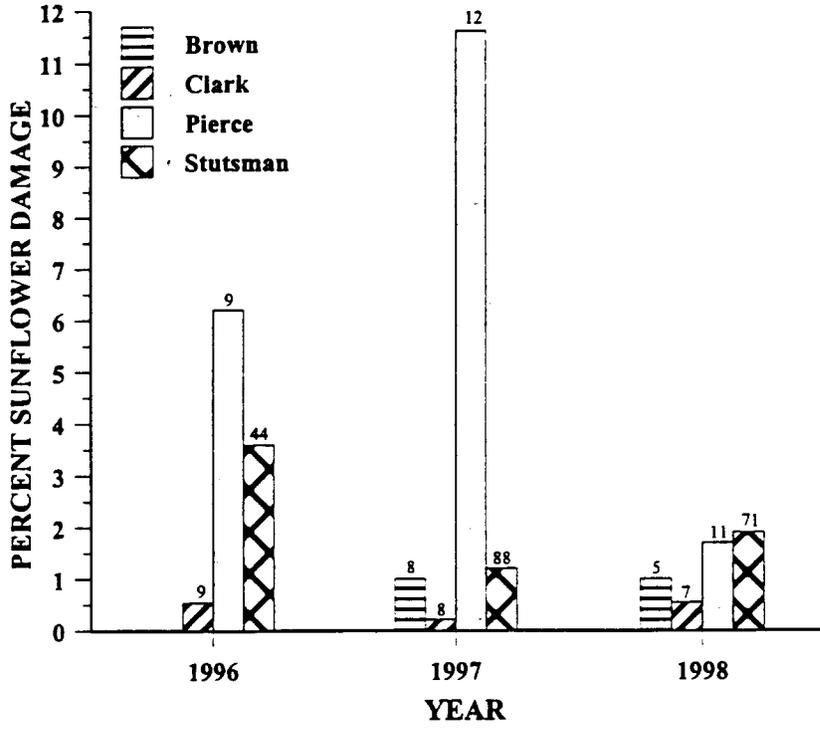


Figure 2. Percent sunflower damage caused by foraging blackbirds during August and September in randomly-selected sunflower fields in Pierce and Stutsman Counties in North Dakota, and Brown and Clark Counties in South Dakota. Damage was not assessed in 1996 in Brown County. Values above the bars represent the number of fields in which blackbird damage was assessed.

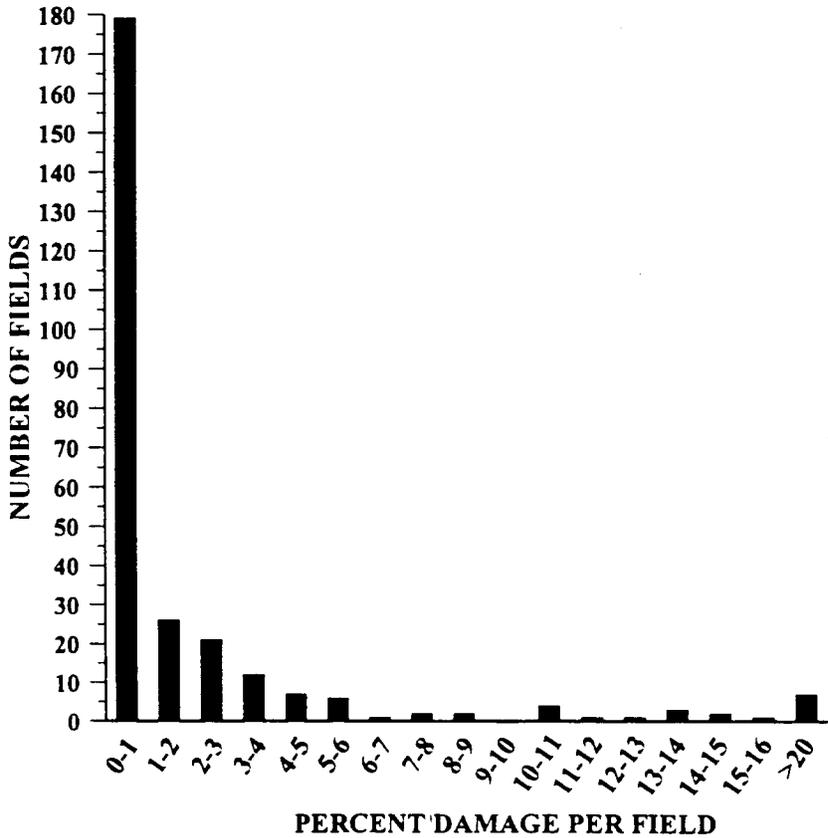


Figure 3. Distribution of randomly-selected sunflower fields by percent blackbird damage observed during August and September in in Pierce and Stutsman Counties in North Dakota, and Brown and Clark Counties in South Dakota.