

Food of Red-winged Blackbirds Collected at a Roost in Late Summer in Cass County, North Dakota¹

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In late summer and autumn large flocks of red-winged blackbirds (*Agelaius phoeniceus*) feed in sunflower fields and cornfields of North Dakota. Observing red-wings in the fields does not imply they are feeding on sunflower or corn (Linz 1982). The red-wing's diet consists of weed seeds, waste grains, and insects for much of the year (Beal 1900, Allen 1914). Thus red-wings perform a beneficial function during these times. Red-wings in agricultural areas, however, often cause significant damage to crops (Meanley 1961, Mott et al. 1972, Crase and DeHaven 1978, Weatherhead and Bider 1979).

Our objective was to determine the foods consumed by red-wings during late summer in an agricultural area of North Dakota. We collected male and female red-wings from 15 July through 26 August 1980 by shooting in late afternoon as the birds entered their night roost in a 300 ha cattail (*Typha* spp.) marsh in Eldred Township, Cass County, North Dakota.

Adjacent to the marsh, the land is intensively farmed, with 90% of the land under cultivation. The area was planted with 39% wheat, 20% corn, 17% sunflower, 14% barley, and 10% other crops (oats, soybeans, edible beans, flax, rye, millet, and sugar beets).

METHODS

Immediately after collection, the birds were placed in plastic bags and packed in ice. Within five hours, the birds were processed or frozen for later processing. Esophageal contents of 134 male and 45 female red-wings were analyzed. The esophagi were stored in 95% ethanol. The contents of each esophagus were emptied into a petri dish and examined under a stereomicroscope at 7x magnification. Various classes of food items were separated into vials of 95% ethanol. After a minimum of two weeks, the contents of each vial were emptied into preweighed plastic cups, air-dried until all the ethanol had evaporated, and oven-dried for 24 hours at 70° C. The contents were then cooled to room temperature and weighed. Foods items weighing less than 0.01 g were recorded only as "present". Samples of less than 0.01 g total dry weight were excluded from further analyses.

Analysis of variance on arcsin-transformed data was used to compare the pro-

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portion of various food items consumed by male and female red-wings. Duncan's multiple range test was used to separate the means; $P < 0.05$ was accepted as significant.

RESULTS

From 15 July-25 August, red-wing males contained more sunflower and small grains (wheat, barley, oats, and proso millet) and less foxtail (*Setaria* spp.) than the females ($P < 0.05$) (Table 1). The proportion of sunflower was highest in both males and females from 12-25 August. During this time, sunflower made up 67% of male and 21% of female diets. This represented an increase of 56% and 16% for males and females, respectively, over the previous two weeks. The percentage of occurrence of sunflower in males increased 55% from 29 July-11 August to 12-25 August. Concurrently, sunflower occurrence in females increased 32%.

During 29 July-11 August, corn was found in 8% of the males and comprised 6% of their diet (Table 1). In the following two weeks, the percentage of occurrence and proportion of corn in male diets increased 5%. Corn was not found in females until 12-25 August, when it made up 8% of their diet and occurred in 17% of the birds.

The proportion of small grains (wheat, barley, oats, and proso millet) and foxtail in male diets decreased 23% and 38%, respectively, from mid-July to the third week in August. During the same period, female use of small grains decreased 8% and foxtail 12%.

Red-wing use of animal matter (largely insects) was highest 29 July-11 August, accounting for 15% of male diets and 16% of female diets. This amount decreased to 5% for both males and females by 12-25 August.

DISCUSSION

In July, small grains, weed seeds, and animal matter dominate red-winged blackbird diets. By mid-August sunflower and corn become an important part of their diets.

The shift in diet composition may be hastened when the small grain fields are plowed soon after harvest. Alternately, sunflower and corn may attract birds, regardless of availability of an alternate food source.

Sunflowers and corn were found in males earlier than females. Male diets also contained a greater proportion of sunflower and corn than did female diets. Other studies comparing male and female food habits have shown that males are largely responsible for crop depredation (Mott et al. 1972, Williams 1975, McNicol et al. 1981). Gartshore et al. (1982), however, found no differences in the amount of corn consumed by male and female red-wings. We found that females consumed more foxtail than males, agreeing with the data of others (Bird and Smith 1964, Mott et al. 1972, McNicol et al. 1981).

Differences in proportion of seeds consumed by red-wings may be related to morphological differences of the sexes. The male's larger size and larger bill probably enables him to exploit sunflower and corn more readily than can the female.

Insects may attract the red-wings to the fields before they begin feeding on the crop itself (Dolbeer 1980, Woronecki et al. 1981). The proportion of insects

Table 1. Percentage of occurrence and percentage of total weight of food items in the esophagi of red-winged blackbirds collected during 1980 as they entered a night roost in Cass County, North Dakota.

Sex	Time Period								Totals	
	July 15- July 28		July 29- August 11		August 12- August 25		Males	Females	Males	Females
	Males	Females	Males	Females	Males	Females				
N	56	12	47	21	31	12	134	45	0.59	0.63
Food Weight (g)	0.17	0.19	0.24	0.15	0.18	0.29				
Food Item	Percentage of Total Weight (Percentage of Occurrence)									
PLANT	88(98)	86(100)	85(98)	84(90)	95(100)	95(100)	88(98)	89(95)		
Sunflowers	1(2)		11(15)	5(10)	67(70)	21(42)	19(22)	10(16)		
Corn	7(9)		6(8)		11(13)	8(17)	7(10)	3(5)		
Other crops ¹	36(62)	14(17)	33(62)	11(24)	13(19)	6(17)	30(52)	10(20)		
Foxtail (<i>Setaria</i> spp.)	42(84)	72(92)	31(77)	68(81)	4(32)	60(83)	29(69)	66(84)		
Incidental and unidentified seeds	2(17)	<1(8)	4(28)				2(17)	<1(2)		
ANIMAL	12(62)	14(.83)	15(75)	16(57)	5(58)	5(67)	12(66)	11(67)		
GRIT ²	(9)	(17)	(6)	(14)	(6)	(6)	(7)	(11)		

¹Includes Wheat, Barley, Oats, and Proso Millet

²Grit not included in food weight

in their diets decreased after mid-August. This may indicate a reduction in insect availability or an increased abundance of acceptable plant foods (McNicol et al. 1981).

We conclude that as sunflower and corn become available, the proportion of corn and sunflower in the red-wing's diet increases. Foxtail seeds are also important, particularly for females.

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