

OKLAHOMA
AGRICULTURAL AND MECHANICAL
COLLEGE

AGRICULTURAL EXPERIMENT STATION
STILLWATER, OKLAHOMA

BULLETIN No. 128

OCTOBER, 1919

THE CROW

(Corvus Brachyrhynchus Brehm)

BY C. E. SANBORN, ENTOMOLOGIST
R. O. WHITENTON, ZOOLOGIST, COOPERATING
C. O. CHAMBERS, BOTANIST, COOPERATING

The publications of the Station are sent free to residents of Oklahoma on request.
All communications should be addressed, not to individuals or departments, but to the
EXPERIMENT STATION, Stillwater, Oklahoma.

THE CROW

(*Corvus Brachyrhynchos Brehm*)

INTRODUCTION—The annual assemblage of millions of crows and their consequent damage in Oklahoma has brought forth a problem of necessary control.

During December, 1918, the Entomological Department of the Experiment Station outlined a project of crow investigation in cooperation with the Zoological and Botanical Departments as follows:

“To ascertain the kinds of food and feeding range of the Oklahoma crow, its roosting and nesting habits, range of egg laying, incubation and development, approximate benefit and damage done, and methods for its control.”

We expect to conclude this investigation next year. The apparent present necessity, however, for general information and the best known methods for destroying the crow has caused us to prepare this preliminary bulletin. We desire that it may be beneficial to persons who can use the information therein contained, and we hope that we will be favored with additional data, that may be used in our next bulletin, from many of the persons who have crow troubles and have ascertained any better methods for satisfactorily controlling them.

By

C. E. Sanborn, Entomologist,
Leader in this work.

R. O. Whittenton, Zoologist
Cooperating.

C. O. Chambers, Botanist,
Cooperating.

—o—

WINTER PREVALENCE OF THE CROW

A proper description of crow prevalence during the winter in Oklahoma would certainly appear fictitious to persons who have not seen some proof of their presence here. Persons who do not travel over the state much, but have noticed local hordes of crows might think that all of the crows in the United States were sojourning in that particular locality.

In order to convey information to show the prevalence of crows in this state as noted by different persons in various parts of the state at practically the same time, I quote the following letters which were sent upon request to the Oklahoma Farmer-Stockman, one of our leading farm journals, also some letters from county agents, and information from other sources.

Mr. A. P. Gregory, county agent, Guthrie, Oklahoma, writes: “I have just footed up the amounts sent in from four of the Community Councils as their estimates of the loss they sustained last year (1918-1919) from depredation from crows, and it shows that \$17,800 is their close estimate of loss from this source alone. This is less than one-fourth of the total loss in Logan county, since much more of the crops which the crows destroy are produced in the other three-fourths of the county than in that part reporting * * *.” The individuals who discuss this matter with me relate stories of loss that are too lengthy to attempt to report in this letter. * * * It is very apparent to one on the grounds that the crow is a real menace and very destructive of much food, feed and wealth. * * *”

Mr. Cliff Bowles of Lincoln county, writes in part, “There is a big crow roost on the farm on which I am living. Last year they destroy-

ed a bale of cotton for me and nearly all of my kafir. It was some damage for me. This is a large roost."

Mr. J. A. Farquharson, ex-county agent of Logan county, on December 11, 1918, reported by long distance 'phone that a crow roost five or six miles west of Guthrie on Gar creek contained approximately a million crows.

Mr. A. D. Sparks of Logan county writes: "I believe that 1,000,000 crows roost near here every night" (This may be the same roost as mentioned by Mr. Farquharson).

Mr. D. S. Orange of Garvin county writes, "There is a large crow roost five miles north of Lindsay on Criner creek. There are, I might say, millions that have roosted there for the last three winters, doing immense damage to the grain crops in the fall."

Mr. Raymond Noll of Kay county writes, "There is a crow roost on Shoo Fly Creek west of Honeyville, Kansas. There is one southwest of Nardin, Oklahoma, on Deer Creek in Kay county. The crows go back and forth from one to the other. The crows are so numerous there that farmers hauled manure from their roosts for fertilizer. We hardly got any pecans last fall on account of the crows. If they are not killed we will never get any kafir."

Mr. J. F. Geyer of Oklahoma county writes, "There is a crow roost seven miles south and two miles east of Newalla. They roost there by the thousands. We have killed hundreds of them, but can't miss any. * * *"

Mr. E. O. Huff of Garfield county reports a crow's roost in two sections of land almost ten miles northwest of Enid.

Mr. Charles C. Ward of Marshall reports a roost on Otter Creek in Garfield county, about six miles northeast of Marshall.

Mr. L. C. Brooks of Jefferson county writes, "Last fall (1918) when I was trying to keep the crows from eating up my peanuts I could have counted a million in my field if I had not been so busy."

Mr. T. B. Jones of Jefferson county writes, "After the fall rains my kafir came out and I made 15 acres as fine as could be. It was late and had to cure in the shock. The crows took to it and ate every bit of grain in three days. It would be safe to say there were thousands. We tried to haul it in from one end of the field, they would eat at the other end. It was surprising how they could go down into the shocks and get every seed. * * *"

Mr. Fred Elenmaier of Blaine county writes, "The crows come to our pond mornings and evening by the hundreds. The pond is eight miles north and two miles east of Geary. There must be several thousands of crows in the neighborhood. They have been a big pest all winter. * * * They almost clean up small fields of kafir or maize. In the summer they destroy lots of watermelons. * * *"

Mr. H. H. Middlebush of Payne county says, "Crows are a great pest. They eat grain, chicken eggs, rob birds' nests, and apparently kill young birds. I have seen them catch young rabbits which had lately gotten their eyes open."

Mr. F. W. Van De Mark of Payne county says there is a crow roost about seven miles east of Stillwater. The crows begin to assemble about a half hour before sundown and continue to come in until dark. There are such irregular streams of flying crows that it is impossible to count them. They come in mainly from the direction of the Cimarron river, i. e., from the south and southeast. There are probably not less than a million in this roost, which is in a narrow valley, mainly covered with oak trees. The trees become literally burdened with them."

A few days after receiving this report we went out to see the crows come in and possibly take a picture of the roost. There appeared to be more crows than had been estimated. They flew in to the roost in small detachments, streams, bunches, waves and clouds. They all perched with their heads in one direction, i. e., toward the wind. They

literally burdened the branches of the trees from top to bottom. It was impossible to secure a photograph on account of the lateness of the hour. The vastness, however, of the crow field was too great to permit of an accurate photograph.

GENERAL HABITS OF THE CROW

Dissemination.—During the month of March the crows begin to disseminate and build their nests. The dissemination is somewhat similar to the migrations of wild ducks and geese in as much as they go north in the spring and come south in the fall. The migration, however, is not conspicuous. It is more of a dissemination in the spring than migration. Their convergence from the north and east into Oklahoma in the fall does not appear to be a choice of each other for company, but rather a resultant consequence brought on by the necessity and prevalence of food and roosting places.

Their gregarious habits do, however, answer nicely as protection to a marked extent since they appear to have guards or sentinels that give alarms of danger which permit them to withdraw in safety. One crow may act as a sentinel for its mate or young during the summer and for a few dozen or an entire detachment during the winter time.

Crows sometimes go without food for several days on account of preventing conditions. For instance, during the winter of 1917-18 a snow occurred which covered all of their available food for several days. The icy crust which formed on the snow prevented them as well as other birds, from getting any food.

Many of the less vigorous crows became so weakened that they could not arise in flight from the ground. In isolated cases sport was made of their capture by use of dogs. The crows when near trees would climb up the trunk far enough to get a start in flight and then be able to obtain safety by flight. Those captured were so weak and emaciated that practically only the skeleton and feathers made up the bulk of their weight.

Nesting Habits.—“For a nesting place the crow usually selects a fork of a tree thirty feet or more from the ground. In most cases the tree is in a grove and the nest is somewhat concealed. It builds a bulky nest of rather large twigs, but lines it with the soft bark of grape vines, grass, twine, etc., so that the interior is smooth and comfortable. About the first week of April the hen lays four to six bluish-white eggs with brown splotches. In fair warm weather the crows are seldom found sitting, but on cool or rainy days they faithfully protect and incubate the eggs. The young hatch about the twentieth of April, grow very rapidly and are fully feathered about the middle of May. They then soon learn to fly and search for food in company with their parents.” (From observations by R. O. Whittenton of the Zoology Department.)

These birds do not attract much attention during the nesting season. There are various reasons why they are not conspicuous. As previously stated they scatter out from their winter quarters. It appears that the majority of them leave Oklahoma and locate far away to the north and east in states where suitable nesting places are also available. Of course many of them remain in this state and rear their brood.

During the brood rearing season an abundance of green foliage is present which renders their presence less conspicuous than during the winter time. They, of course, are also less active at this time, and furthermore refrain from cawing to each other and thus attract less attention from animals that might rob their nests.

When the brood leaves the nests they are conducted by the old birds in search of food. Their habits are such that they remain within the protection of timbered land to a very marked extent. The boun-

dary lines of timber along open pastures, wild hay fields and cultivated grounds afford considerable of such food as they desire. It is no uncommon sight in June, July, August and September to see from four to seven or eight crows marshalled by one or two old ones, seeking food in or near timbered areas. The old ones are always on the alert. Some of them may be on the ground, but at least one of them will generally be perched on some object such as a post or tree nearby, in order to announce the presence of any danger.

Later in the season, beginning during the latter part of October, these broods begin to attract each others attention at common feeding places, and millions congregate in common roosting places.

Food Habits.—The crows are somewhat beneficial during the summer season when the larger forms of insects are prevalent. Many of our insect pests in Oklahoma, however, are of such a nature that the crows would not care to bother them. Such insects as chinchbugs, hessian flies, melon and cotton lice, corn leaf-lice, moundbuilding ants, squash bugs, cabbage bugs, and similar forms which are very injurious to crops here, are doubtless never molested much by crows. Some of the beetles, grasshoppers, crickets and similar pests are used as food by them.

Young rabbits, young chickens and turkeys, many young wild birds, and especially the eggs of poultry and wild birds, are destroyed to a marked extent by the crow. During the early days of Oklahoma before the crows were very numerous, their damage to wild birds and especially quails was scarcely noticeable. In accordance with the following quotations the quail in some localities is now said to be almost entirely exterminated by crows. "The crows and hawks destroy more quail each year than all the hunters and bird dogs together, the hawks by catching the mother birds,* and the crows by breaking up the quail nests before they hatch." George Newman, Tulsa county.

It appears that the wild birds if allowed to propagate would render much more service in controlling the agricultural insect pests, without doing much damage to the crops or domestic fowls. Yet the crow seems to be given considerable credit for his services of insect control by some lovers of nature. It is evident, however, that persons who laud the crow for his services are better acquainted with his northern than his southern habits.

Crops Used as Food by the Crow.—Oklahoma boards the crow during the winter and thus raises a heavy burden from the northern and eastern states, where it appears to be more of a summer resident than a winter pest. The nature of the farm crops here and the timber lands make a Hotel de Lux for them. They have acquired the habit of decoying others and returning here until it appears that the annual crop of crows from several states winters here.

The most serious complaints relative to crop damage indicate that the following products are seriously damaged by them; Indian corn, kafir, sorghum, maize, darso, peanuts, pecans, melons and cotton. They also injure germinating corn and oats.

Their damage to crops, purloining of eggs and destruction of wild animal life is not only tremendous, but their habit of carrion eating makes of them disseminators of such livestock diseases as black leg, anthrax and similar contagious infections. This latter damage is potential in character and practically incomputable. In estimating a crow's daily board bill, this potential damage is not mentioned, but may equal several hundred dollars per day in the case of a very few crows that may spread contagion from dead animals infected with disease germs.

Gizzard Content Analysis.—It is very difficult to obtain and identify all the material which a crow may eat during the day because of the peculiarity of the digestive system. There is no crop or food storage receptacle such as is common in chickens. The gizzard is the main food storage organ. This works like a chicken's gizzard. In it

the food is ground and elaborated into small particles, then passed into the intestines for assimilation. The food is generally broken into small pieces by the beak before it is swallowed. A grain of corn for instance is generally broken into three or four pieces. Smaller grains such as kafir and weed seeds are generally swallowed whole.

Our investigation thus far shows that grain, peanuts and pecans were the principal diet during the fall and winter when available. At other times animal offal, weed seeds and insects were the principal gizzard contents.

TABLE—ANALYSIS OF STOMACH CONTENTS

Date 1918	Hour	Number of Crows	Contents of Stomach		
			Insects	Grains, Weeds and Animal Matter	Per Cent
Dec. 4	4 P. M.	2		Indian corn	90
				Partridge pea	10
1919 Feb. 1	8 P. M.	1	Carabid beetles		10
				Miscellaneous matter	90
Feb. 10	11 P. M.	16	Beetles	Pasty secretions	20
Feb. 19	9 P. M.	5	Beetles	Hulls and fibers of plants, not identified	80 20
Mar. 15	8 P. M.	3	Beetles	Fibers of plants, not identified..	80
May 18	4 P. M.	2 young	Insects	Rodents, probably young rab- bits	10 20
				Carrion	70
Oct. 12	9 A. M.	2	Insects	Pecans	10
				Hackberries	60
Nov. 6-7	5 P. M.	13	3 had parts of grass- hopper 1 beetle	Three contained corn	10 to 60
				Nine contained hackberry seeds	10 to 60
				Grape seeds	20 to 30
				Seven contained kafir seeds.....	10
				One contained sunflower seeds..	10
				Two contained gravel	10 to 60
Nov. 17-20	3-9 P. M.	14	1 Wasp 3 grass- hoppers 1 beetle 3 trace 6 none	Three contained corn	10 to 90
				Six contained hackberry seeds	20 to 90
				Six contained grape seeds or hulls	20 to 100
				Two contained pecan bits.....	100
				Three contained sunflower seeds	2 to 30
Nov. 20-22	8 A. M.	16	none	Four contained gravel	10 to 70
				Sixteen contained corn+strych- nine, 3 to a dozen kernels of corn	10 to 100
				Three contained wild grapes	50 to 90
Dec. 2 9	A. M.	2	none	Five contained gravel	10 to 60
				Two contained kafir seed.....	80 to 90
				Two contained gravel	10 to 20

The figures given in the table are only approximate.

It is almost impossible to give accurate estimates of the percentages of material found in the gizzards of crows so far taken by shooting them as they return to roost at night. In many cases they were almost empty; whether from scarcity of feed or on account of rapid digestion is not certain. Most of them were taken in February, when most of their food was obtained by infesting the feeding grounds of cattle during the day, in small flocks. Most of this seemed to have been picked up by following the cattle rather than by robbing the cattle of feed put out for them. The bulk of the matter consisted of hulls and ground hay or fodder which had evidently passed the grinding digestive tract of the cattle.

The Crows Board Bill.—In figuring out the daily board bill of the crow in this state, we can only get a crude estimate as a result by considering the price of grain and the probable amount that a crow can obtain per day.

Our winters are generally mild and open. Normally the crows will feed during 120 days at least, during their winter sojourn. Available data shows that we boarded at least 10,000,000 crows last winter. Our estimate was at least 1 bushel of grain per thousand head per day. One dollar per bushel was less than the average market price. Considering, however, that 1,000 crows ate one dollars worth of feed per day, it would follow that 10,000,000 crows would eat \$10,000 worth per day. Since we boarded these crows 120 days, at this rate their total board bill would be \$1,200,000 for last winter.

Following is a computation which was originated by four Community Councils of Logan County. They estimated that the crows did a \$17,800 damage in their part of the county in 1918-19. They represented only one fourth of the county. Consequently, the damage for the county would be \$71,200. Now the roosting places and food ranges of the crow are such that at least twenty counties were ravaged equally to Logan County. This therefore would make a total estimate of \$1,424,000 for the crows' winter board bill, which is an added difference of \$224,000 to our computation.

Present Methods of Control.—It appears that some uniform action of destruction should be promulgated superior to the present bounty system for the reduction of the crows' board bill. At present a bounty of \$200 per county can be paid for crow scalps by the county treasurers. The county treasurer can receive scalps in quantities of 20 or more at the rate of 5 cents apiece. He can then turn in sworn statements supporting the payments to the state game warden, who in turn may reimburse the county up to the amount of \$200.

The inefficiency of this low bounty, and general aggression against crows is well shown in their increased abundance each year. In consequence of this fact it appears that definite arrangements should be made for crow destruction in an economical manner, either by specialists who can be relied upon, or a campaign started whereby each county in the state may devote several days in a sportive way to the destruction of this pest.

Advisable Methods for Poisoning.—The crow can be poisoned in accordance with a formula given by Mr. E. R. Kalmbach, Assistant Biologist of the Bureau of Biological Survey, in Bulletin No. 621. Several methods of applying poison may be used, but the one as given in the above mentioned publication seems, however, to be one of the most proficient treatments. It is as follows:

Corn	20 quarts
Strychnine	1 ounce
Starch	2 tablespoonfuls
Water	1½ pints.

Mix the starch and strychnine in the water and heat to boiling, stirring thoroughly after the starch begins to thicken. Pour this mixture over the corn and stir till every kernel is coated. The corn may then be spread out and dried."

Whenever a feeding ground of the crows is located, the poisoned grain should be distributed so that they can get it without exposing it to domestic animals. Discretion must be used in distributing poison in order not to poison animals for which it is not intended. The crow is a wary bird and after treatment is given on one feeding ground, the unaffected ones are likely to change to another feeding ground on account of its apparent affect on those affected. Under such conditions it may become necessary to resort to the use of other baits, especially the material upon which they may be feedinig, such as kafir, sorghum, peanuts, etc.

Beef heads or fresh carcasses of animals may be treated with

strychnine and placed in trees or places frequented by the crows with good results.

Although the crow is not a game bird, and its meat is not considered a delicacy, some people (allegorically speaking) occasionally eat one! Much more enjoyment and sport, however, can be obtained by shooting them.

During the summer time or any time after the old ones begin brooding, the crows can be easily decoyed and killed. A good crow call (a small instrument which can be made to simulate the "caw caw" of a crow), used by a person in ambush, will generally attract the parent birds within hearing distance or an entire brood after the young can fly. Being curious, and also jealous of crow intruders, they will approach within shooting distance. If the old ones are killed by the first shots, the young will become easy marks.

A better and more profitable method, especially for winter sport may be brought about by arranging a blind and bait in connection with a perch shooting line near their feeding grounds or in a favorable place. The blind can be made of any kind of frame work supports covered with straw, hay, weeds or fodder. The perch line can be made of posts set in a sort of "bead line" and "stair step" fashion from the blind. The farthest post should be about one foot higher than the first post and within a gun shot distance from the blind. The first post should be on a level with the gun stand and within ten or twelve steps of the blind. The intervening posts should all be in line, but not in a straightaway line from the gun stand. In sighting at the top of the posts the first post should be about an inch the lowest and an inch to the left, and the last post should be about a foot to the right and a foot higher than the middle post. The tops of the intervening posts should be in line with first, middle and last post. A series of boards or poles may be used to connect the tops of the posts to be used as a continuous perch line by the crows.

The bait (beef or pork offal, or reasonably fresh carcass) should be placed between the first and central posts.

After the gunner has secreted himself comfortably in the blind, with reading, and other material with which to spend his spare time, he can use the crow call occasionally and any crows within hearing will generally pass the signal along to others and within a very short time they will begin to collect in a wary-like fashion on the perching line. By using good judgment several crows may be killed at one shot.

If it so happens that crows are within sight of the blind before the gunner enters, they will take warning and cannot be decoyed, but if two or three persons will go to the blind, one can remain without being suspicioned by the crows after the others have left.

Peculiarities of the Crow.—As was previously noted, a crow can reason, but he is a bonehead in mathematics. When a detachment of crows are flying near the ground in search of food, one of them may observe a small prize that is being overlooked by the others. Will he call the attention of the others to it? Not much, if he can manage it himself—otherwise, yes. What does he do if he can manage it himself? First he uses reason, just makes note of the location and flies right along with the company as if nothing had happened.

As soon as their attention is attracted to something such as alighting in a tree, he will maneuver back to his prize.

It generally happens, however, that some of his comrades will notice his peculiar departure and they will likewise use reason and accompany him. Apparently being more afraid of losing the prize otherwise, he will generally hurry to it and make the best he can of it.

Much more can be said of the crow than this preliminary bulletin will permit. We hope that it is sufficiently interesting and important to cause its readers to send us any information supposed to be important on the subject.