

CONTROL AND ECOLOGY OF THE BLACK-BACKED JACKAL *CANIS MESOMELAS* IN THE TRANSVAAL

J. DU P. BOTHMA

* *Transvaal Nature Conservation Division*

INTRODUCTION

The black-backed jackal *Canis mesomelas* is the most important problem animal in sheep-farming areas of the Transvaal (Van Rensburg, 1965). As a result of this it has been under intensive study by the Transvaal Nature Conservation Division. Van Rensburg (1962) described the use of the "Humane Coyote Getter" in the control of jackal in the Transvaal. The present report deals with the results of further experiments undertaken in various parts of the Transvaal between February 1962 and September 1969 with this device and adds ecological information derived from these experiments.

RESULTS AND DISCUSSION

LENGTH OF CONTROL PERIOD

When a getter is set in the ground it is useful to have some knowledge of the average time required before reasonable success is achieved. The objective of setting the getter should be to kill a specific jackal responsible for sheep depredation in a specific area. By skilful study of the habits and habitat of the jackals in the area, and by setting the getter in accordance with these observations, it is possible to achieve some measure of selectivity towards the problem jackal.

Data on 564 jackals killed during the experimental period were examined. Most getters were deliberately left in the ground until no further pulls occurred over an extensive period of time. In most cases getters remained set for at least three to four weeks. However, some getters never showed any signs of having been visited by jackal. These getters were removed after about two to three weeks in the ground. All getters were rebaited at regular intervals.

Most jackals were killed within the first two weeks after the getters were set (Table 1). After the third week new kills were relatively few. Fig. 1 shows that the average getter was most successful on the second day after it had been set, and that kills became negligible after the first 14 days. It is therefore recommended that a control effort should not exceed a maximum length of two weeks in a given area. A week should usually be sufficient to kill the culprit sought. Leaving getters in the ground for long periods of time may be detrimental to other animals which may pull these getters.

* Present address: Chair of Wildlife Management, Mammal Research Unit, Dept. of Zoology, University of Pretoria.

TABLE 1

A COMPARISON BETWEEN THE TIME THAT ALL GETTERS WERE IN THE GROUND, AND THE NUMBER OF BLACK-BACKED JACKALS KILLED WITH THE GETTER IN A 60-DAY PERIOD IN THE TRANSVAAL

<i>Time lapse in days</i>	<i>Jackal killed</i>	<i>Percentage of total</i>	<i>Percentage added to total during week</i>
7	354	62,8	62,8
14	447	79,4	16,6
21	497	88,1	8,7
28	520	92,2	4,1
34	540	95,8	3,6
41	549	97,6	1,8
48	557	99,1	1,5
55	562	99,9	0,8
60	564	100,0	0,1

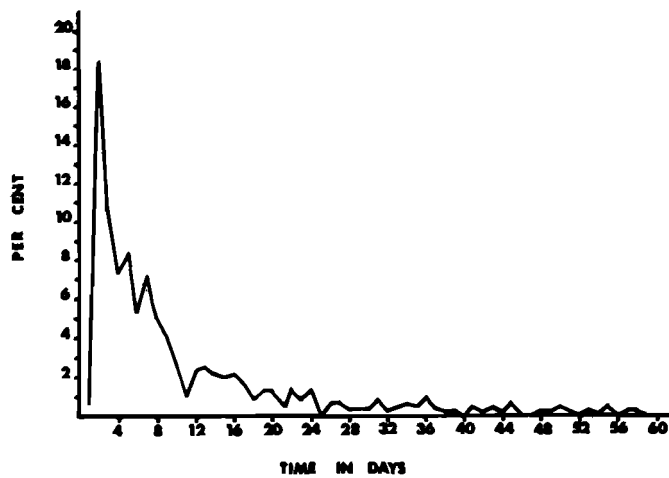


FIGURE 1

Daily percentages of Black-Backed Jackals killed within the first 60 days after the getters were set.
Based on kill records for 564 jackals.

EFFECTIVITY OF A SINGLE GETTER

Of 1 237 getters pulled and fired by all animals during the period of study, 60,6 per cent were fired once, 23,9 per cent twice, 9,4 per cent thrice, 4,0 per cent four times, 1,5 per cent five times, 0,4 per cent six times, and 0,2 per cent were fired seven times at the same spot. Of the getters involving black-backed jackal kills, 74,8 per cent were pulled once, 19,0 per cent twice, 4,1 per cent thrice, 1,4 per cent four times, 0,5 per cent five times, and 0,2 per cent six times. This implies that once an average getter has killed two jackals its potential effectivity is negligible. It may then be more economical to remove this getter and to set it elsewhere.

There is some overlap in the range of adult jackals. The majority (76,4 per cent) of those getters taking more than one adult jackal, killed two only, while one getter killed six jackals (Table 2).

TABLE 2

NUMBER OF GETTERS KILLING MORE THAN ONE ADULT BLACK-BACKED JACKAL IN THE SAME LOCALITY IN THE TRANSVAAL

<i>Number of adult jackals killed at the same spot with one getter</i>	<i>Number of times this occurred</i>	<i>Percentage of total</i>
2	68	76,4
3	17	19,1
4	1	1,1
5	2	2,3
6	1	1,1
—	—	—
Total	89	100,0
—	—	—

ENVIRONMENTAL INFLUENCES

Because of the aromatic nature of the baits used (Van Rensburg 1965), it was reasoned that the getter would be more successful during periods of high relative humidity while high temperature should dry out the bait and make it less effective.

Therefore an experiment was designed which lasted with minor interruptions from early October 1965 to early May 1966, a total of 186 experimental days. Experience proved that most getters were pulled between early evening and early morning. Temperature, relative humidity, and barometric pressure readings were taken at eight a.m. During the last phase of the study, a baro-thermo-hygrograph with a seven-day drum and a 24-hour chart was used.

The getters were visited once a day, and rebaited when necessary. Since any jackal found dead during the inspection would most likely have been killed during the previous night, or the early morning of the find, weather records for eight o'clock that morning were used to approximate those during the kill.

The results indicated that jackal were killed over the entire range of temperature, relative humidity, and barometric pressure observed in the study. Means of each weather parameter of days when jackal were killed, showed no statistically significant difference when compared to days when jackal were not killed (Table 3). Windy, dusty conditions are probably detrimental to getter success. The winds dry out the fresh bait, and dust accumulates on the bait to make it practically useless.

TABLE 3

A COMPARISON OF WEATHER CONDITIONS FOR DAYS ON WHICH JACKAL WERE KILLED AND DAYS ON WHICH JACKAL WERE NOT KILLED WITH THE GETTER IN THE WARMBATHS DISTRICT OF THE TRANSVAAL FROM OCTOBER 1965 TO MAY 1966

<i>Weather parameter measured at 8 a.m.</i>	<i>Jackal killed</i>		<i>Jackal not killed</i>	
	<i>Mean</i>	<i>n</i>	<i>Mean</i>	<i>n</i>
Per Cent relative humidity	56,1	67	55,3	88
Temperature, ° C	23,2	67	23,1	88
Barometric pressure ..	27,43	68	27,46	88

There was some indication that rainfall might influence getter success. In January 1966, Mr. M. E. Keith, who managed this experiment, reported as follows: The weather conditions during the month of January had been ideal for the experiment. The first two weeks of the month were considerably dry. On the evening of the 20th the barometer showed a sharp drop in atmospheric pressure. Rain began to fall on the 22nd and continued with light showers to the 25th. Four to six inches of rain fell in the district. From the beginning of the month to the 22nd, six jackal were killed in 22 days. From the 22nd to the 25th a further six were killed in only four days.

* Thus some indication exists of a link between rainfall and getter effectivity. Yet although March 1966 was one of the driest months of the experiment 16 jackal were killed during that month. The answer probably lies in a combination of weather conditions and abundance of jackals in the area, which is extremely difficult to measure.

Moonlight was another aspect of the environment which was thought to have some influence on getter success. Therefore all the getters pulled by jackal from October 1965 to May 1966 in the Warmbaths district were analysed according to the moon phase at the time of the kill. Four moon phases were used: New Moon, First Quarter, Full Moon, and Last Quarter. The light phase was taken as first quarter and full moon; the dark phase consisting of new moon and last quarter. Van Rensburg's (1965) definition of getterdays was used as a catch rate. The results of the study appear in Table 4.

TABLE 4

THE INFLUENCE OF MOON PHASE ON THE RELATIVE SUCCESS OF THE GETTER IN THE TRANSVAAL FROM OCTOBER 1965 TO MAY 1966. GETTERS WERE SET FOR 3 673 GETTERDAYS AND 171 PULLS WERE REGISTERED†

Moon phase			
	All pulls	Catch rate* All animals	<i>Canis mesomelas</i>
New Moon	21,0	27,5	34,6
First Quarter	26,3	35,9	41,6
Full Moon	18,0	29,5	40,9
Last Quarter	21,0	31,6	41,3

* Catch rate = Getterdays per animal (Van Rensburg 1962).

† Even though the best jackal catch rate was obtained during the darkest phase, it is doubtful whether moon phase has any special influence on the success of the getter.

ECOLOGY

Some ecological data on *Canis mesomelas* were obtained during the course of the work. The results are fragmentary in many cases since the experiment was not designed as an ecological study. Nevertheless the data warrant a short discussion.

Ratios and body mass: A total of 277 adult jackals yielded a sex ratio of 1,2 males for every female. The same jackals were used to determine the average body mass for adults of the two sexes (Fig. 2). The results were; males: mean and standard deviation = $8,35 \pm 0,92$ kg, range = 6,8 to 11,1 kg, n = 151; females: mean and standard deviation = $7,75 \pm 0,86$ kg, range = 5,2 to 10,2 kg, n = 126.

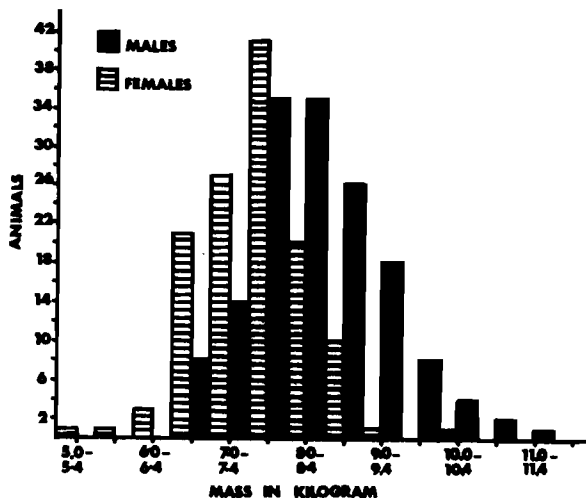


FIGURE 2

Frequency distribution of the body mass of 277 adult *Canis mesomelas* killed in the Transvaal.

Reproduction: Fifty-five females were either pregnant or lactating (Fig. 3). No female was pregnant and lactating at the same time. A female in season was found on the 17th of June 1963. The majority of the 27 pregnant females were found in September. The seasonally earliest recorded pregnancy was 14th July 1962, the latest 8th October 1962. The earliest lactation was 7th September 1968, the latest 17th November 1962. Thus the pregnancy spread was 86 days and the lactation spread 71 days. However, this may not be very significant since the spread occurred over several years.

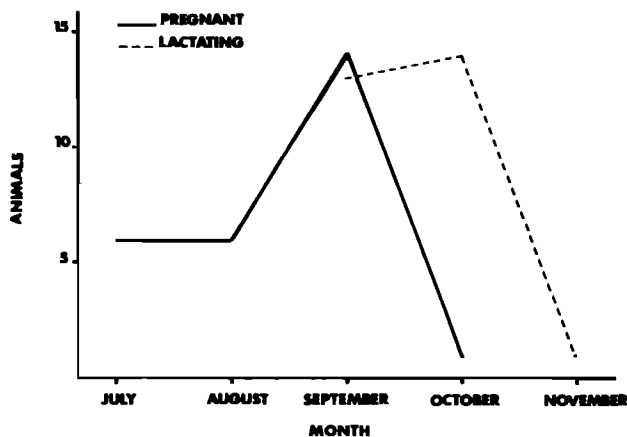


FIGURE 3
Monthly distribution of 27 pregnant and 28 lactating *Canis mesomelas* killed in the Transvaal from 14 July 1962 to 2 September 1969.

Twenty-two litters were available for study. These gave an average litter size of 4.2; range two to six. The litter sizes decreased slightly from July (mean 4.5, range 3–5, $n=6$) to August (mean 4.4, range 2–6, $n=5$), and September (mean 3.9, range 2–5, $n=11$). The start of the breeding season seems to be during the first two weeks of July; the end in early October. No lactating animals were found before September. The heaviest foetus weighed 179 g (September 1969); the smallest 2.6 g (July 1962).

SUMMARY

A control effort should not exceed two weeks in any specific locality. After this period the relative effectiveness of the getter is greatly reduced and outweighed by its dangers. Should a specific problem jackal be sought, however, getters may be left in the ground until the animal concerned is killed. A single getter may be successful more than once. Therefore, the proper use of a limited number of getters should yield better results than the indiscriminate use of a large number of getters. Excepting wind, there seems to be no relationship between

weather and the effectiveness of the getter bait. Control efforts in the period July to September have the advantage that pregnant females are killed, thus preventing young from being born and added to the population. If a population is already low, however, and a single culprit is sought, control efforts during the breeding season should be avoided. Pregnancy occurs from July to September, with a peak in September. Suckling seems to terminate in late November. The average litter size approximates four.

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