ON THE DISPERSAL OF ACACIA GIRAFFAE BY GAME

By O. A. LEISTNER,

Botanical Station, Kimberley (Division of Botany).

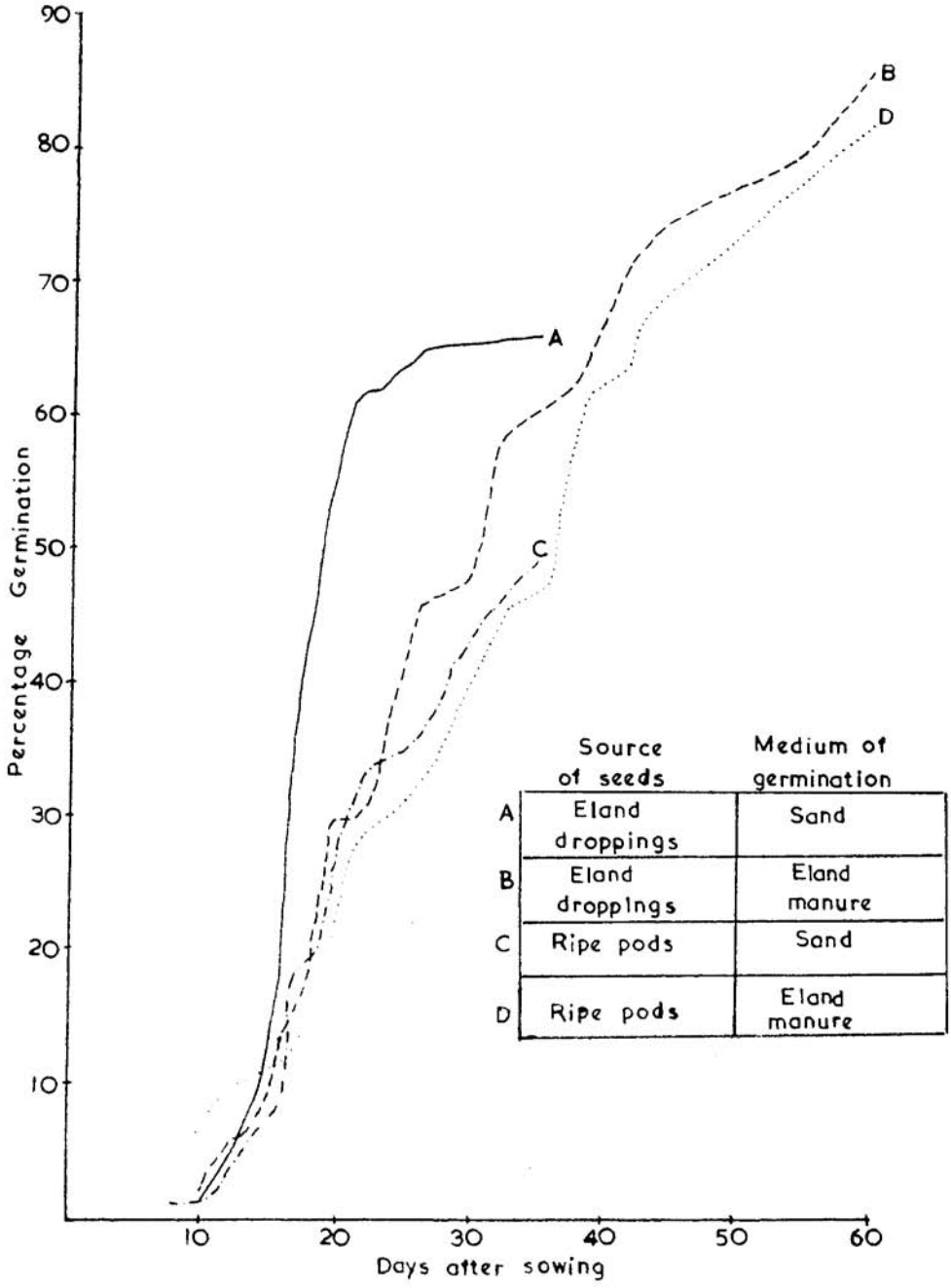
(Published with permission of the Secretary for Agriculture.)

The camelthorn, *Acacia giraffae* Willd., flowers from the middle of September to the beginning of November. The fruits are shed in the dry season, mainly from May to July when grazing is getting scarce. *Acacia giraffae* has stout, curved pods. They are normally 5-8 cm long and 1.5-2.5 cm broad. The seeds (usually 8-25) are embedded in a spongy substance with a sweetish taste. The fruit wall consists of a strong fibrous layer and an outer felty covering of very short grey hairs. The nutritive value of the pods compares well with that of lucerne (Walter, 1954).

The following game species are known to feed on the fruits of *Acacia giraffae:* Elephant (Walter, 1954), giraffe, black rhino (Wilhelm, 1950), gemsbok and eland (Leistner, 1959). It is most likely that other antelopes, e.g. kudu, make use of this valuable food source.

Large quantities of pods may be consumed by game; thus on one occasion 170 seeds were recovered from the droppings of probably a single eland. One pellet contained 9 seeds. This is remarkable when it is considered that the average diameter of an eland pellet is 2.5 cm and camelthorn seeds are about 1.1 x 0.9 x 0.6 cm. Walter (1954) was able to recover a few hundred seeds from elephant droppings in a short time.

The seed coats are thick and tough and there is no evidence for normal seeds being harmed by chewing. To test the effect of stomach juices on the viability of the seeds four experiments (A-D) were made. For A and C 100 each were used while for B and D only 50 each were available. For experiment B seeds were removed from the pellets and planted in loose manure. A and C had to be broken off after 35 days.



GERMINATION OF SEEDS OF Acacia girattae.

Source of seeds.	Medium of germination.	Percentage germination.	
		After 35 days.	After 60 days.
A. Eland droppings	Sand	66	—
B. Eland droppings	Eland manure ...	60	86
C. Ripe pods	Sand	49	—
D. Ripe pods	Eland manure ...	46	82
The following experiments were done by Walter (1954):			
1. Ripe pods	Sand	92	—
2. Elephant droppings	Sand	78	—
3. Cow manure	Sand	52	—

Germination of seeds of *Acacia giraffae*.

In the first few weeks after sowing the germination rate of ingested seeds tends to be higher than that of ordinary seeds. This agrees with the findings of Walter (1954). After six weeks or more, however, there is no marked difference in the percentage germination as can be seen in B and D. From Walter's experiments it appears that the viability of ingested seeds is reduced. It is, however, possible that the total potential germination had not yet been realized. Manure seems to have a slightly retarding influence on the germination rate. This is, however, not regarded as significant. Further and more detailed experiments are needed to throw light on the factors influencing germination.

How would seeds be dispersed without the aid of animals? The average mature pod weighs about 14 gm and has a specific gravity of 0.6. As the fruits have no adaptation for wind dispersal only gales could move them to an appreciable distance from the tree. Water too can be disregarded as a dispersal agent of any importance. Firstly *Acacia giraffae* rarely grows along rivers that are active during the dry season. Secondly it prefers sandy soils on which the run-off is generally small.

About 150 seeds from fruits that had been dropped several months before were inspected. All pods were moist as heavy rains had fallen during the previous three weeks. Although some fruits had started to decompose not a single seed was found in them that showed any signs of germination. At the same date and in the same locality large numbers of germinating seeds were found in cattle droppings.

A number of borer beetles (*Curculionidae* and other groups) live on the seeds and the pulp in the pods of the camelthorn. About a third of the ripe fruits still on trees and more than half the ones lying on the ground are infested by them. Pods that had reached an advanced stage of decomposition were only rarely found to contain viable seeds.

How is dispersal aided by game? As has been shown the pods are dropped in the dry season when grazing is getting scarce. Their feeding value is high and they are eaten by several game species. On ingestion the activities of several insects capable of destroying the seeds are stopped. Passage through the alimentary canal apparently has no harmful effect on the seeds. By the time they are excreted the animal can have covered a distance of several miles. There are indications that germination is delayed if the pellets in which the seeds are contained dry out completely before they come in contact with moisture. This is not regarded as a disadvantage since no insects were noticed that attack seeds in dung.

The largest percentage of antelope droppings are found in concentration areas, e.g. around waterholes, under big trees, along paths. In these localities the cover of perennial grasses is usually disturbed. It has been pointed out by several ecologists (Van der Schijff, 1959) that seedlings of woody plants have much better chances of establishing themselves in areas where the growth of grasses is weakened.

It is concluded that in regions where game is present in large numbers it plays a vital role in the dispersal of *Acacia giraffae*.

ACKNOWLEDGEMENTS.

I wish to express my thanks to Dr. R. C. Bigalke for valuable advice and criticism and to Mr. C. F. le Riche who collected some of the material dealt with in the present paper.

REFERENCES.

Leister, O. A. (1959): Notes on the Vegetation of the Kalahari Gemsbok National Park with special reference to its influence on the Distribution of Antelopes. Koedoe 2: 128-151.

Van der Schijff. H. P. (1959): Weidingsmoontlikhede en weidingsprobleme in die Nasionale Krugerwildtuin. Koedoe 2: 96-127.

Walter, H. in Walter, H. & Volk, O. H. (1954): Grundlagen der Weidewirtschaft in Südwestafrika. Eugen Ulmer, Stuttgart.

Wilhelm. J. H. (1950): Das Wild des Okavangogebietes und des Caprivizipfels. *Journ. S.W. Afr. Sci. Soc.* 7: 5-71.