

Viability of Illyrian Thistle Seed Following Ingestion by Goats and Sheep

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Illyrian thistle (*Onopordum illyricum*) is a vigorous biennial thistle of tableland pastures and is essentially unpalatable to sheep and cattle. The flowering thistles present a physical barrier to stock movement and increases vegetable fault in wool. Campbell and Holst (1990) reported that goats ate Illyrian thistle seedheads and prevented the dispersal of viable seed, thus effecting control by reducing the population of Illyrian seeds in the soil over time.

However, no information is available on the effect of ingestion on seed viability. The aims of this study were: (1) to examine the viability of Illyrian thistle after ingestion by sheep and goats; and (2) to estimate the rate of passage of seed through the animals.

METHODS

Prior to the commencement of the experiment to examine the effect of ingestion on viability, seeds were cut to promote germination (Campbell *et al.*, 1991) and 60 seeds were placed on wet filter paper in each of five dishes to determine the proportion of viable seeds offered to stock.

Following an introductory feeding program, four mature crossbred ewes and four mature cashmere goats were placed in metabolism cages and conditioned to feeding and housing for one week.

Each morning, all stock were fed a daily *ad lib* ration of lucerne (*Medicago sativa*) chaff with 18.7% crude protein. Residues were monitored and on the day the seeds of Illyrian thistle were introduced, animals were given 90% of their previous average intake of lucerne chaff to ensure that all seeds were consumed.

On Day 0, 3300 Illyrian thistle seeds were fed to each animal in lucerne chaff. Thereafter, for the following five days, faeces were collected from each animal. Seeds were recovered by wet sieving the faeces. Whole seeds were cut to promote germination and placed onto moist paper in petri dishes. Germination was monitored for 14 days after which remaining seeds were cut in half to identify any which contained an embryo and were therefore potentially viable.

RESULTS

Germination of seeds offered to livestock was 63% (± 2.2). Over the five day collection period, <1% of the viable seed remained viable following passage through sheep or goats (Table 1).

All seeds passed through the digestive tract by Day 5 of

Table 1: Total number of seeds collected and the number viable after recovery from faeces of sheep and goats.

Livestock type	Total seeds collected ^A	Number viable ^B	% viable after ingestion
Sheep	4.6	2.7	0.13
Goats	5.5	3.3	0.16

^A Average of 4 animals over 5 days of all seed collected; ^B Average of 4 animals over 5 days of viable seeds collected.

collection (Figure 1) with the majority of both viable and damaged seeds being excreted by Day 2.

DISCUSSION

Campbell and Holst (1990) showed that goats ate almost all flowering seedheads of Illyrian thistles before the seeds matured. This study showed that if any seeds did mature, only 0.16% would pass through the goat in a viable state. As sheep ate far fewer seedheads than goats, many viable seeds would be returned to the paddock from mature seedheads. To prevent spread of seeds to "clean" paddocks, a cleansing period of at least five days is necessary for both sheep and goats.

REFERENCE

Campbell, M.H. and P.J.Holst (1990). *Proceedings of the 9th Australian Weeds Conference*, Adelaide, pp 493-496.

Campbell, M.H., W.J.Nielsen and H.L.Nicol (1991). Some factors affecting the germination of achenes of *Onopordum illyricum* L. *Plant Protection Quarterly*, 6: 70-72.

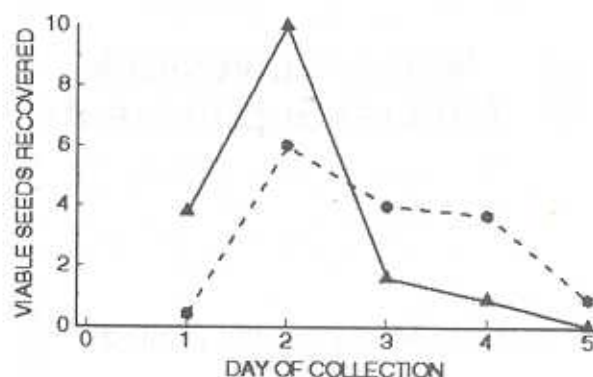


Figure 1: Average recovery from each animal of viable Illyrian thistle seeds following ingestion by goats (—) and sheep (----)