

Seed Germination and Reproductive Capacity of *Lasiurus sindicus* Henr

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Abstract Germination of *L. sindicus* seed is hypogeal type. Natural plant population have three categories of seed : large, medium and small. The optimum temperature for germination is $32^{\circ} \pm 1^{\circ}\text{C}$. The average percentage germination is 67 ± 5.56 . The average seed output is 9471 plant⁻¹ and it varied with the size of the plant. The reproductive capacity is 6345.57.

Key words Seed character, Germination, Reproductive capacity, *Lasiurus sindicus*

Lasiurus sindicus Henr. is a nutritious fodder grass and grown in arid region of Indian desert 'Thar' (Bhandari 1990). Naturally, this grass is restricted in north western districts of Rajasthan i.e. Bikaner, Barmer and Jaisalmer (Bishnoi & Gautam 1990). The grass perennates by means of underground roots during dry conditions and sprouts with the onset of rains. This grass has a great adaptability of resisting extreme drought conditions as evident by its distribution (Gupta & Saxena 1970). The present study, therefore deals with the seed characteristics, germination and reproductive capacity of this grass.

Materials and Methods

For a representative sample, grass spikelets were collected in the month of October/November 1990 from Jor-beer, Bikaner (Rajasthan). Seeds were separated from the spikelets by rubbing between rubber mat and coarse wooden block. The morphology of seed was studied by recording the seed shape, size, weight and volume. The length and breadth of seeds were determined by Screw gauze. Weight of 100 seeds of each size was taken separately. Volume of seed was measured by water replacement method.

Germination was recorded of healthy seeds. The seeds were surface sterilized with 0.1% mercuric chloride solution for one minute and rinsed thrice with distilled water. Germination per cent was recorded in quadruplicate by keeping 25 seeds in each petri dish containing a moist filter paper at different temperature for three days.

The average number of seeds plant⁻¹ was determined first by selecting ten healthy plants of different size viz. 87.51 ± 17.13 cm height and 105.26 ± 23.34 cm basal area, growing on sand dunes in protected area. At the end of September five healthy spikes on each selected plant were covered with polythene bags and tied at base. Five spikes from each selected plant were harvested for determination of seed output and reproductive capacity by standard method following Salisbury (1942) and Pandeya *et al.* (1968).

Results and Discussion

Seed characters : The seed is monocot type (Fig 1a) with a single cotyledon. From the selected plants, seeds were separated into three categories based on their approximate size. The small seeds were non viable, whereas large and medium size seeds were viable but differ only in their weight and size (Table 1). The small seeds were more than double to the number of large and medium size ones. The large seeds were twice in length than breadth. In smaller seeds, the length and breadth decreased proportionately. The weight of large seeds constituted 21%, medium seed 28% and small 51% of total weight of 100 seeds in the mixture from the selected plants. The shape index (length/breadth) of large and medium seeds was approximately same.

Germination : The germination was hypogeal type. It was observed that $32 \pm 1^{\circ}\text{C}$ was the most suitable for germination (Table 2). There was no germination below 27°C and beyond 42°C . At optimum

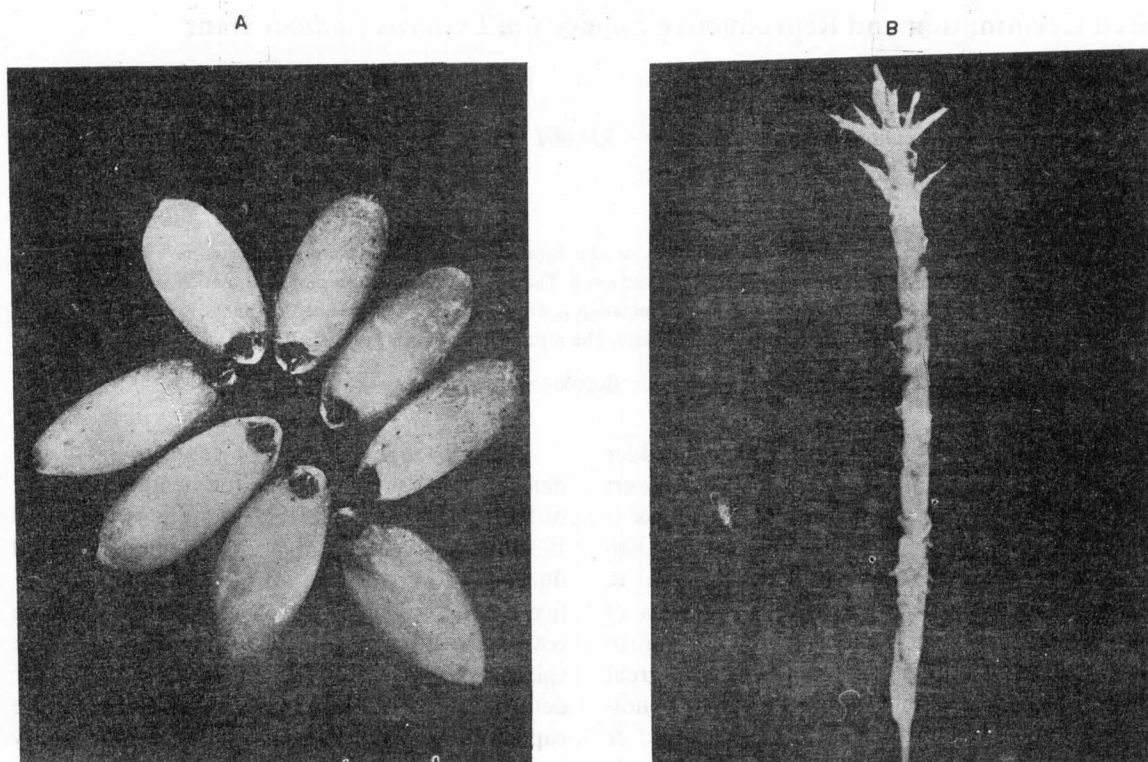


Fig 1 Moncot type seed of *L. indicus* (a) and basipetal abscission of spikelets (b)

temperature ($32 \pm 1^\circ\text{C}$) the germination started after one hour of soaking. In the beginning it was 31%. After 24 hours of soaking the germination percentage was 49 and 61 respectively (Table 3).

Table 1 Seed characters of *L. indicus*

Parameters	Seed size		
	Large	Medium	Small
Distribution (%)	21	28	51
Av. weight of 100 seeds (mg)	328.5	250.8	128.0
	± 26.14	± 8.00	± 11.2
Length of seed (mm)	3.3 ± 0.35	3.0 ± 0.16	2.2 ± 0.25
Breadth of seed (mm)	1.5 ± 0.12	1.3 ± 0.08	1.1 ± 0.13
Shape index (L/B)	2.20	2.30	2.0
Volume of 100 seed (mL)	0.20	0.15	0.10

Reproductive capacity : The reproductive capacity (6345.87) of the plant is low (Table 4) because, the average number of fertile spikelets spike⁻¹ (Table

Table 2 Seed germination at different temperature.

Temperature ($^\circ\text{C}$)	Germination %
25	—
27	41.13 ± 4.21
30	57.33 ± 7.57
32	67.00 ± 5.56
35	54.11 ± 7.21
37	36.33 ± 6.11
40	9.11 ± 5.65
42	5.40 ± 4.00
45	—

— No germination
After 72 h of soaking

Table 3 Dynamics of seed germination at $32\pm 1^\circ\text{C}$.

Time (hr)	Germination (%)
12	31 \pm 5.77
24	49 \pm 7.59
36	61 \pm 7.18
48	65 \pm 6.37
72	76 \pm 5.56

4) and number of seeds produced per spike 21 ± 6 (Table 4) is very low. The seeds from the terminal and basal spikelets in each spike were very low. The terminal spikelets fall very early without producing viable seeds. It was interesting to note that abscission of spikelets is basipetal (Fig 1b) and each spikelet falls gradually one by one. Most of the viable seeds were found in the middle part of the spike. Very few seeds remained in the lower spikelets as those fall off after maturation. Thus the number of seeds collected from the spikes plant^{-1} were low and therefore the reproductive capacity was also low.

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Table 4 Plant growth and reproductive *L. indicus*

Parameter	Values
Plant	
Height (cm)	87.5 (\pm 17.1)
Diameter (cm)	105.3 (\pm 23.34)
tillers (Nos)	81.0 (\pm 11.0)
Spike (Nos)	451.0 (\pm 72.0)
spikelets (Nos)	74.0 (\pm 4.0)
Fertile spikelets spike ⁻¹	17.0 (\pm 7.0)
Spike length	9.9 (\pm 0.56)
Seed	
Seed spike ⁻¹	21.0 (\pm 6.0)
Seed output plant ⁻¹	9471.0
Germination (%)	67.0 (\pm 5.6)
Reproductive capacity	6345.6

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