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USE OF WATER ABSORBING POLYMER FOR THE ESTABLISHMENT OF SEWAN (*LASIURUS SINDICUS*) PASTURE

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Natural regeneration of rangelands is quite slow and time consuming in arid region, therefore, reseeding is the only option for faster improvement in the productivity of rangelands. Efforts in this direction by Chakravarty and Verma (1968) and Chakravarty and Bhati (1969) have been made through mechanical treatment of soil. Low moisture retention in sandy soil results in moisture stress at seedling stage after leading to mortality. Therefore, effectiveness of a water absorbing polymer was evaluated in comparison to direct seeding and pellet sowing techniques.

The experiment was conducted at CAZRI, Regional Research Station, Bikaner. The soils are *Typic* Camborthids containing sand 93.0%, silt 1.9% and clay 5.1%. The annual rainfall was 180 mm and about 70% of it was received during experimental period (July to November). The treatments were: (i) direct seeding: seed mixed with moist soil and drilled uniformly in lines, (ii) pelleting: pellets of 0.5 cm diameter prepared by mixing grass seed, FYM, pond silt and sand in proportion of 1 : 1: 3 : 1 using sufficient quantity of water, sun dried and sown, (iii) polymer seed treatment : seed and polymer mixed in the ratio of 20:1 (W/W), and (iv) polymer band placement : @ 10 kg/ha was applied in the soil prior to seeding and mixed in soil to a depth of 10 -15 cm. Fifty seeds of *L. sindicus* were sown in each plot with 25 x 25 cm spacing. The germination and survival were counted upto 25 and 50th day after sowing, respectively. Observations on fodder yield, basal diameter and number of tillers per plant were recorded at the time of harvest (flowering growth stage).

To examine the effect of polymer on physical properties of soil, five doses i.e. 0, 10, 15, 20 and 25 kg/ha of polymer were tried. The maximum water holding capacity was measared by Hilgard's apparatus. Field capacity was measured as per routine laboratory procedure and infiltration rate was measured by infiltrometer ring method.

The results of growth attributes reported in Table 1 revealed that the germination of grass seed was significantly higher in basal placement of polymer over other treatments. Direct seeding and polymer seed treatment were found statistically at par and minimum germination was observed in pellet sowing. It indicates that polymer band placement retained the soil moisture for a longer period which helped in germi-

nation of grass seeds while in pellet sowing, movement of water upto the seed might have been restricted due to the pelleting material, thereby retarding the seed imbibition process. Chakravarty and Bhati (1969) also reported that pellet seeds did not give better germination in dry farming conditions. The survival of grass seedlings, was quite high irrespective of the treatment. It might be due to high adaptability of the grass to the local environment. There was an over all superiority of band placement of polymer (10 kg/ha) over other treatments. This can probably be due to retention of moisture for relatively longer period in soil while in other treatments the moisture loss from seed surroundings could have been faster.

Table 1. Effect of different reseeding techniques on growth attributes of *L. sindicus*

Growth parameters	Direct seeding	Pellet sowing	Polymer seed treatment	Polymer basal placement	CD 5%
Germination (%)	46.0	34.2	42.2	58.8	4.8
Survival (%)	86.9	88.1	87.1	92.5	4 9
Basal diameter (cm)	7.1	5.9	7.9	9.2	1.3
Height (cm)	62.0	54.8	59.8	89.0	3.6
No. of tillers/plant	17	13	19	23	2.5
Grass yield (q/ha)	34.5	20.0	34.8	47.0	4.9

Grass yield was significantly higher in band placement of polymer (47.0 q/ha) over other treatments and grass yields in direct seeding and polymer seed treatment were at par and they were significantly superior to pellet sowing. Jain and Das (1986) also reported the positive effect of water absorbing polymer on height and conopy of the plant.

Physical properties as affected by different treatments are given in Table 2. There was an increase in water holding capacity (21.8 to 50.0%) and field capacity (8.1 to 15.0%) with the application of polymer upto 20 kg/ha over control. The infiltration rate gradually decreased with increase in application of polymer upto 20 kg/ha from 19.8 to 11.6 cm/hr in control.

Table 2. Effect of water absorbing polymer on the physical properties of soil

Polymer (kg/ha)	Water holding capacity (%)	Field capacity (%)	Infiltration rate (cm/hr)
0	21.8	8.1	19.8
10	38.0	11.5	14.9
15	44.0	13.0	11.6
20	50.0	14.2	10.9
25	51.0	15.0	10.6

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