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EFFECT OF DRY SEEDING PERIODS, SEED TREATMENTS AND DEPTH OF SOWING ON PERCENTAGE EMERGENCE OF GROUNDNUT SEEDS

M.S. PATEL and B.A. GOLAKIYA
Gujarat Agricultural University
Junagadh - 362 001

ABSTRACT

A pot experiment was conducted to know the effect of dry seeding period, seed treatments, and depth of sowing on the percentage emergence of groundnut cv GAUG-1. It was found that dry seeding to the depth of four cm and upto 2.5 days with seed dressed by fungicide (Thirum @ 3 g/kg seed) and insecticide (Linden @3 g/kg seed) proved superior with highest percentage emergence.

KEY WORDS : Groundnut, Seed emergence, Dry seeding, Seed treatment, sowing depth.

The advance sowing bears good prospects for the *kharif* groundnut. Places where the onset of seasonal rainfall is abrubt at the commencement of rainy season and the probabilities of continuance of rain are fairly dependable offer an excellent scope for dry seeding (Virmani, 1979). Since kernel proved as a good sowing material, the further work in this line includes investigation of advance sowing upto the period for which seed could ramain in the soil with an ability to emerge out on raining, different seed treatments to minimize dehydration of seeds to protect them from soil born diseases and pests and the adequate depth of sowing to withstand the dry spell,

MATERIALS AND METHODS

A pot experiment was conducted on advance sowing of groundnut cv GAUG-10 during summer, 1983 on vertic inceptisol (medium black calcareous soil). The treatments include watering in days after sowing (DAS): 7 DAS (S_1), 14 DAS (S_2), 21 DAS (S_3) and 28 DAS (S_4), Seed treatment: plain seed (T_1), neem cake coated (T_2), fungicide (Thirum @ 3 g/kg) + insecticide (Linden @ 3 g/kg) coated (T_3), and T_2 + T_3 (T_4), oil coating: seed without oil coating (O_1) and with castor oil coating (O_2), and depth of sowing at four (D_1) and eight cm depth (D_2). The treatments were replicated twice in a completely randomized factorial design. At the specified period, the pots (35 cm diameter, 25 cm height) were watered up to the field capacity of soil. Thereafter the soil was allowed to dehydrate as it happens in fields during dry spell over a period of two weaks. After 14th day of watering germination counts were recorded. Unfortunately, treatment S_4 could not attained its specified DAS as the first rain of monsoon watered the S_4 on 25th day after sowing.

RESULTS AND DISCUSSION

The dry seeding period S_3 reduced percentage emergence by 23.1 as compared to S_1 (Table 1). Though the emergence decreased with increased dry seeding period, results of treatment S_4 were odd enough and registered the highest

Table 1. Average effects of treatments on percentage emergence

Dry sowing period	S_1 78.4	S_2 77.6	S_3 55.3	S_4 79.0	C.D. (0.05) 4.5
Seed treatments	T_1 72.4	T_2 68.6	T_3 75.9	T_4 70.9	4.7
Oil coating	O_1 71.2	O_2 71.6			NS
Depth of sowing	D_1 74.9	D_2 68.2			3.1

emergence. This ambiguity, however favourable, is difficult to resolve.

As already mentioned, S_4 experienced first natural rainfall of the season and it may be inferred that onset of monsoon might have provided congenial weather for germination and emergence. Whatever may be the exact reason, it could be deducted that the 25 days period did not affect adversely to seedling emergence. In seed treatment T_3, the dressing of seed with fungicide and insecticide proved superior. Earlier investigations (Schumutterer, 1966, El Hadi and Nasar, 1964) have shown that application of Dieldrin, Diettrex A or B and 3 g per kg seeds of groundnut was very effective in increasing plant stand. Effect of oil coating was nonsignificant. Shallow depth of sowing i.e. D_1 (4 cm) outnumbered the deeper sowing. Similar observations were made by Nir and Gasim (1977) in case of groundnut. Backman and Hammond (1976) also reported germination losses associated with delayed soil drenching of seed treatment fungicides.

Dry seeding in advance and its interaction with fungal growth have been implicated for losses of sown seeds. For instance, Harper *et al.* (1955) suggested that seeds of maize sown in warm dry soil may meet the lethal conditions. Wallace (1960) concluded that soil fungi are involved in the death of wheat seedings held under moisture stress. In case of the interaction between dry seedling period and seed treatments (Table 2), combination S_1T_1 registered the highest emergence of

Table 2. Interaction effects of dry seed period and seed treatments percentage emergence

Seed treatment	Dry seeding period			
	S_1	S_2	S_3	S_4
T_1	89.3	78.0	40.0	73.
T_2	74.4	72.6	56.9	80.(
T_3	70.0	80.0	66.9	86.(
T_4	80.0	70.6	57.5	75.(
	CD (0.05)		6.5	

89.3 per cent. Simultaneous increase both treatments i.e. S_2T_2 and S_3 exhibited decreasing trend of emergenc But S_4T_4 reversed the trend due to unusu weather conditions.

Interacting effect of depth of sowi with dry seeding period and seed treatme is shown Table 3. Under S_3D_3 emergen decreased below 50% but 80% emergen was recorded with S_4D_2. The better effe of S_4 over S_3 at D_2 depth could be due natural raining and favourable alteratio occurred in the weather during form period. However, S_1D_1 was significan superior with 86.5% emergence. On t whole, interactions between D_1 and S lev were superior to that of D_2 except S_4. T superiority of treatment combination S_4 is due to the fact that deeper showing ([requires higher water content for prolong emergence. This demand was fulfilled first monsoon rain which saturated the s during period S_4. With different se dressings and depth of sowing, T_2 registered 65.3%, the lowest and T_3 80.2% the highest emergence. Rest of t combinations showed erratic trend.

Table 3. Interaction effects on depth of sowing with dry seeding period and seed treatments percentage emergence

Depth (cm)	Dry seeding (period days)				Seed treatments			
	S_1	S_2	S_3	S_4	T_1	T_2	T_3	T_4
D_1	86.6	77.8	58.4	74.5	78.8	70.6	80.2	75.3
D_2	70.9	69.5	49.0	80.0	64.4	65.3	73.5	67.5
CD (0.05)	4.5				4.3			

able 4. Interaction effects among the dry seeding periods, seed treatments and depth of sowing on percentage emergence

	Dry seeding period (days)							
	S_1		S_2		S3		S4	
	Depth of sowing (cm)							
:eed 'eatment	D_1	D2	D1	D2	D1	D2	D1	D2
1	93.8	82.5	71.5	43.5	85.0	73.8	75.0	48.8
2	81.5	72.5	73.8	61.3	67.5	60.0	75.0	58.8
3	83.8	82.5	76.8	68.8	77.5	33.5	87.5	63.0
4	80.0	72.5	71.3	65.0	75.1	72.5	55.0	47.0
D (0.05)				9.2				

The interaction effects among seeding eriods, seed treatments and depth of)wing are presented in Table 4. Decrease the percentage emergence under D_2 as)mpared to D_1 either in combination of S T was a general trend with few :ceptions. The combination $S_3T_3D_2$ ands lowest (33.5%) in percentage :rmination, while $S_1T_1D_1$ with 93.8 nergence was superior to all. However, T_3D_1 was at par with $S_1T_1D_1$. In short, dry eding of seeds, dressed with fungicide d insecticide, and their sowing at the pth of four cm could emerge satisfactory to 25 DAS.

contentent shallow sowing favours seedling emergence.

ıble 5. Treatment effects on mortality (%) of seeds

epth of)wing (cm)	Dry seeding period (days)				Seed treatments			
	S_1	S2	S3	S4	T1	T2	T3	T4
1	8	12	21	16	14	18	10	20
2	17	17	25	18	23	22	14	25
D)0.05)		6.0				4.0		

Lowest mortality (8.0%) was recorded der S_1D_1 and the highest (25%) under D_2 (Table 5). Mortality increased with dry eding period except S_4. Seed treatment reduced mortality by 10%. The depth of wing D_2 increased mortality up to 25%. It deduced that under adequate moisture

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