STUDY THE EFFECT OF DIFFERENT SEED TREATMENTS ON GROWTH OF SEEDLINGS OF 'BIRI-LEAF'

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Introduction

This is in continuation of the study "Germination of Biri-Leaf" seeds under different treatments.

Objectives

Study and compare growth rate of seedlings under various seed treatments.

Plan of Work

1.	Location.	Miani.
2.	Area.	0.25 Acres.
3.	Period.	June, 1984.
4.	Species.	(Diospyrose melanoxylon) (Seed).
5.	Treatments.	6—A—Hot Water Treatment
		B—Cold Water Treatment
		C—Seed Scratching Treatment
		D—Tera-sorb Treatment
		E—Cow-Dung Treatment
		F—Control Treatment
6.	Method of sowing.	Sowing on ridges.
7.	Method of irrigation.	Flow irrigation.
8.	Spacing.	One foot apart.
9.	Depth of water delivered.	3-inch.—6 times per month.
10.	Total delta delivered.	216-inch.—18 feet.
11.	Number of seed in each replication of each treatment.	50 Nos.
12.	Number of replications.	6 Nos.
13.	Total Number of seeds sown.	
14.	Design.	Randomised block.

Data tabulation

Measurements of height growth of seedlings were recorded after full one year of growth. The growth data has been given in the following table.

TABLE I

Height Growth (in C. ms.)

Repli-cation	Treatments						Total Block
	A	B	C	D	E	F	
1.	14.0	19.9	27.0	17.6	36.3	29.3	144.1
2.	11.6	42.0	24.0	47.9	37.3	38.7	201.5
3.	27.0	35.3	35.0	39.3	23.0	36.1	195.7
4.	15.7	34.1	16.4	20.9	24.5	22.7	134.3
5.	15.1	29.7	23.8	24.5	25.8	31.2	150.1
6.	13.5	27.6	21.3	25.4	26.5	23.4	137.7
Total treatment	96.9	188.6	147.5	175.6	173.4	181.4	963.4
Mean $\overline{X}$	16.2	31.4	24.6	29.2	28.9	30.2	

Results

Height growth data has been statistically processed and "ANOVA" table has, as such, been constructed. Details of sum of squares computed, are given in annexure—I.

TABLE II

"ANOVA"

Source	D/F	SS	MS (Variance)	'F'
Treatments	5	972.462	194.4924	4.98
Blocks	5	750.569	150.1138	3.84
Error	25	976.155	39.0462	
Total D/F	35			

Tabulated 'F' ratio of 3.86 at 1% level of significance with 5/25 Degrees of freedom is smaller than the computed value of 4.98, in case of treatments, rendered to seeds. This indicates that difference in effect, of treatments is prominently significant at 1% level.

Similarly, larger 'F' ratio of 3.84 computed in case of blocks, than the tabulated value of 2.6 at 5% level with 5/25 Degrees of freedom allows to accept the fact that the seedlings have not been growing in the similar environmental conditions. This is, apparently due to the effect of certain factors, which regulated and controlled the compatibility of growing conditions in the experimental area.

Least significant Difference (L.S.D.) test is applied to differentiate the effect of treatments from one another.

$$ S \overline{X} = \sqrt{\frac{2 \times 39.0462}{6}} = \sqrt{13.0154} = 3.61 $$

T   =   2.06 at 5% level of significance,

Least significant Difference = D = T x $\overline{SX}$ = 2.06 x 3.61 = 7.44

	A	B	C	D	E	F
F	30.2—16.2 = 14.0	—	30.2—24.6 = 5.6	30.2—29.2 = 1.0	30.2—28.9 = 1.3	—
E	28.9—16.2 = 12.7	—	28.9—24.6 = 4.3	—	—	—
D	29.2—16.2 = 13.0	—	29.2—24.6 = 4.6	—	29.2—28.9 = 0.3	—
C	24.6—16.2 = 8.4	—	—	—	—	—
B	31.4—16.2 = 15.2	—	31.4—24.6 = 6.8	31.4—29.2 = 2.2	31.4—28.9 = 2.5	31.4—31.2 = 1.2
A	—	—	—	—	—	—

No difference between two means of treatments B,C,D,E and F is more than the product

(L.S.D.) of T x $\overline{SX}$ = 7.44. Treatment 'A' only however, gives exceptionally low mean, as it appears from the figures of difference between means, underlined for the purpose.

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Treatments differing significantly from one another, therefore, are :—

F — A
E — A
D — A
C — A
B — A

Treatment means placed in ascending order, are :—

| $\dfrac{A}{16.2}$ | $\dfrac{C}{24.6}$ | $\dfrac{B}{28.9}$ | $\dfrac{D}{29.2}$ | $\dfrac{E}{30.2}$ | $\dfrac{F}{31.4}$ |

See chart Annexure — II.

| $\dfrac{A}{16.2}$ | $\dfrac{C}{24.6}$ | $\dfrac{B}{28.9}$ | $\dfrac{D}{29.2}$ | $\dfrac{E}{30.2}$ | $\dfrac{F}{31.4}$ |

Conclusions

1.   Growth rate of seedlings in all other five treatments, B,C,D,E, and F, being statistically similar, treatment "A" only, which has shown lowest growth rate, as it appears from least significant Difference Test, has been the reason to have caused significant difference in the Analysis of Variance of treatments.

2.   The effect of environments and certain other factors on the growth of seedlings is believed to have given rise to the significant difference between blocks in the Analysis of variance. The impact of weeding, irrigation, shade and soil etc. on the growth rate of seedlings is apparenty significant which does not appear in case of "Germination test of Biri-Leaf Seed"
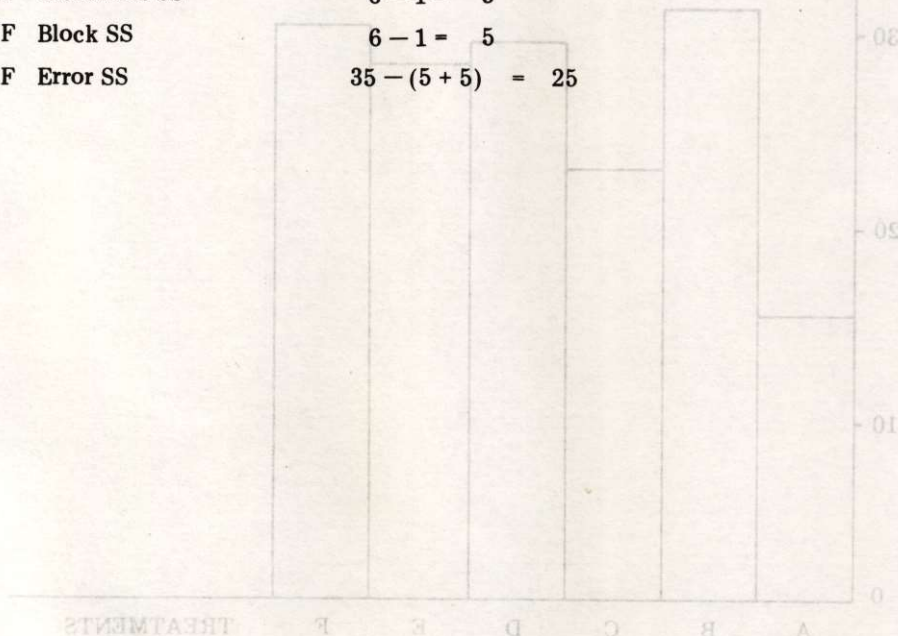
This leads to visualize and postulate that, full size healthy mature seeds, if sown in sandy-loam or clayeyloam, kallar free soil, latest during the ensuing mon-soon season, without treatment give out healthy seedlings, which grow faster in an open sun-light, with an adequate canal water irrigation if not allowed to submerge.

ANNEXURE—I

COMPUTATION STATEMENT OF SUM OF SQUARES.

1. Correction Factor $\dfrac{(963.4)^2}{6}$ = $\dfrac{928139.56}{36}$ =   25781.654

2. Total SS   28480.84   —   25781.654   =   2699.186

3. Treatment SS $\dfrac{160524.7}{6}$ —   25781.654

        = 26754.116   —   25781.654   =   972.462

4. Blocks SS $\dfrac{159193.34}{6}$ —   25781.654

        = 26532.223   —   25781.654   =   750.569

5. Error SS   2699.186   —   (972.462 + 750.569)

        = 2699.186   —   1723.031   =   976.155

D/F   Total SS   36 — 1 = 35

D/F   Treatment SS   6 — 1 = 5

D/F   Block SS   6 — 1 = 5

D/F   Error SS   35 — (5 + 5) = 25

HEIGHT GROWTH

ANNEXURE — II

CHART

SHOWING TREATMENT MEANS

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60 -

50 -

40 -

30 -

20 -

10 -

 0 -
     A     B     C     D     E     F        TREATMENTS
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