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Effect of different soil regimes on growth of Dolichos uniflorus Plants

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ABSTRACT

The present investigation comprises experimentations into the community structure and growth behavior of Dolichos uniflorus Lam. Which is widely cultivated in Gaya division of hilly areas as important rain fed crop. The effect of different soil, moisture, regimes indicated better performance in garden soil regimes and dunny soil regimes in this plants indicating there by the corroboration of the concept of the better performance of S_1, S_2 in soil regimes moisture around the field capacity from a higher dry weight in S_1 and S_2 its adaptation to garden and dunny soil regimes was marked. The contrasting behaviour of Dolichos uniflorus Lam. Maximum dry matter accumulation occurred in the soil with moisture nearer to field capacity and maximum mineral component and reduction of dry matter accumulation was recorded in sandy soil, red soil and rehra soil regimes. Such observation were also made in different plants by several workers, Menon and Mariakulan etal 1957, Maria 1957, Ray Chaudhari 1953, as regards from the higher dry weight of the species in S_1, S_2 and S_3 condition its adaptation to garden soil regimes mixed with cow dung showed best performance in all respect in comparison to sandy soil, red soil and rehra soil regimes.

Keywords :- Effect of different soil regimes on growth

INTRODUCTION

Agriculture practices have changed constantly in response to demand from an increasing population for more produce from the same amount of land. Thus pressure for change has never been greater than the last hundred years. The development of scientific enquiry has coincided with a period in which land has been required to produce more and more. One of the most obvious features of soil is its texture, which is determined by the proportions of discrete particles of sand, silt and clay within a sample. Here sand, silt and clay are terms used to differentiate the coarse size fractions (sand) from the finer (silt) and the finest (clay) size fractions. Much more frequently we find that there are distinct, identifiable aggregates which have a finite strength. Only when they crushed and rubbed between the fingers do they dismember to yield individual grains. Even then although we cannot see this with the naked eye, it is likely that much of the clay will remain aggregated together are referred to as pads and their strength, size and shape give the soil its structure of soil. Dorkuchaev was

struck by the layering evident within most soils. Sometimes the boundaries between their horizons are very sharp, sometimes they merge and occasionally the boundaries show strong undulations. Above the soil bedrock lies coarsely weathered fragmented rock the parent material in the field, the profile is usually differentiated into horizons by color for instance, the upper horizons are often darker than the lower. While the lower parts of the solum resembles in color the parent material from which it is derived, the upper horizon often grades into the decaying lead litter found at the surface. Furthermore earthworms and other soil organism are more common in the upper parts of the soil and chemical investigation. There is a very close relation between soil and biosystem and because of this some of the earlier soil classification was essentially vegetation classification. Example – 'Soil of the Coniferous forests". At time it is difficult to establish whether plants and animals control the nature of the soil or vice verse. The inter dependence of soil, vegetation and geology may tend to mask another important relationship between soils and climates.

MATERIALS AND METHODS

The plants of the maximum value of root length stem height and number of branches/plants. The better performance of plant in monostrand was evident. The reduction of branches under denser strands has also been reported by Deschenes and Legers 1982. The data on dry weight acquisition best growth of plants under D condition was inferred. This observation is fully in consonance with those of Bazzaz and Herper 1976, Tripathi and Gupta 1980, Fowler 1984.

The better performance of S_1 S_2 in soil regimes moisture around the field capacity from a higher dry weight in S_1 and S_2 its adaptation to garden and dunny soil regimes was marked. The contrasting behavior of Dolichos uniflorus Lam the plant of S_1 and S_2 tolerated dryness better performance then lesser performance S_3, S_4 and S_5, soil regimes. The behavior of RGR indicated of positive response in S_1 and S_2 regimes. The RGR indicated positive response in S_1 and S_2 regimes. The NAR of S_1 and S_2 was maximum response in S_3, S_4 and S_5 regimes plant having lowest different soil regimes. In the species RGR appeared to be governed by the level of NAR, LWR and S/R ratio lesser the also. As regards S_1 and S_2 regimes of the species behaved identically in having higher Chlorophyll content in S_3, S_4 and S_5 regimes and that plant under extremes of soil regimes. Interestingly chlorophyll content appeared different in all the soil regimes.

As regards chlorophyll content the Dolichos uniflorus species behaved identically in having higher Chlorophyll content in S_1 regimes and the plants under soil reported by "Red Sandy Soils" Kaolinite and elite are important clay minerals that occur in substantial quantities. In the clay fraction of this soil group Ghos and Datta 1972, Datta and Adhikari 1972, Shahu and Nanda 1972 reported the presence of 10-20% montmorillonite in the red sandy of Nandya district in Mysore.

RESULTS AND DISCUSSION

It is obvious that higher value of Root length per plant, stem height, number of branches/plant were observed in control S_1 garden soil, S_2 dunny soil S_3 in comparison to sandy soil, red soil and rehra soil (the data were found highly significant) is shown in Table no. 01.

Table 1

Mean values of primary growth attributes of Dolichos uniflorus Lam, at different ages under different soil conditions.

Age (days) Harvest No.		Root length(cm)						Stem height (cm)						Number of branches/plant					
		S1	S2	S3	S4	S5	S6	S1	S2	S3	S4	S5	S6	S1	S2	S3	S4	S5	S6
15	1st	6.20	5.95	5.02	1.80	2.20	2.55	6.77	6.70	7.70	1.62	3.37	2.80	2	2	2	1	1	1
30	2nd	7.20	5.62	5.12	2.70	3.37	2.62	8.87	8.52	8.12	2.27	4.62	4.05	3	2	4	1	1	1
45	3rd	8.95	7.52	6.37	2.75	4.37	3.30	11.95	10.20	11.87	2.37	5.12	4.05	4	2	6	1	2	1
60	4th	9.54	8.45	7.62	2.85	5.12	4.20	15.20	15.20	16.37	2.50	5.87	5.12	5	3	7	1	2	1
75	5th	11.87	7.37	8.62	3.35	6.37	5.30	15.87	19.70	16.37	2.87	6.70	6.40	8	5	9	1	3	1
90	6th	12.12	10.82	9.20	4.12	6.87	5.62	22.62	21.80	18.37	3.12	7.37	7.37	10	6	10	1	3	1

S1 = Control
S2 = Garden Soil
S3 = Dung Soil(Cow dung)
S4 = Sandy Soil
S5 = Red Soil
S6 = Rehra Soil

"Rehra soil reported by Ray Chaudhuri et.al. 1963, studied the morphology and genesis of some selected saline and alkali soil of Bihar" the red soil reported by Menon and Mariakulandai 1957, analyzed the data on the revenue department in regard to the classification by them of the 13 districts of the former state of Madras and found that red soil. As regards the initiation of flowering. It is clear that garden S_1 soil enhanced the initiation of flower. This observation is consonance with those of Gupta 1964, Das and Das 1966, Goel. et.al. 1991, Goel et. al. 1992, Goel et.al. 1993, Goel et.al. 1993.

Reference

1. Agrawal, P.K. and Prakash G. 1978 :- Control of seed germination in some Indian trees Trop. Ecol. 19:174-177.
2. Deschenes J.M. and Legers A. 1982 :- Effect of the density quack grass (Agropyron refens) and of the presence of barley (Hordeum vulgare cultivar loyal) on the growth of quack grass. Nat. can.(One) 108(3) : 271-278.
3. Bazzaz, F.A. and Herper, J.L. 1976 : Relationship between plant weight and number in mixed population of synopsis azvensis and lepidium satirum L.J. Appl. Ecol. 13: 211-206.

4. Sharma, S.S. and Sen, D.N. 1994 : Effect of certain growth regulators on seeding growth and pigment system in Merremia species. Briochem. Physiol. Pflanzen. 166 : 401-410.
5. Agrawal, S.K. 1971 – Effect of thiourea and ascorbic acid on seed germination. J. Indian Bot. Soc. 50:374-376.
6. Ambasht, R.S. and Lal B. – 1978 – Ecological studies of chrozophora rottleri A Juss, Vol. 11, VI Apwass Proc. Jakarta, P.P. 153-163.
7. Baskin, J.M. and Baskin, C.C. – 1974 – Some Ecophysiological aspects of seed dormancy in Geranium Carolianum. L. Oekoligia (BER), 16(3) : 209-219.
8. Bertaud, D.S. – 1990 – Photoperiod and Temperature affect sprouting of onion bulbs (Allium cepa L) Ann. Bot. 66:179-181.
9. Blackman, V.H. – 1919 – compound interest law and plant growth. Ann. Bot. 33:353-360.
10. Chatterji, A.K. – 1992 :- Germination studies on Fagopyrum spp. Ph.D. thesis, Patna University, Patna.
11. Chatterji, U.N. – 1969 :- Some consideration relating to seeds and seed germination section of Agriculture's sciences congress, Bombay.
12. Chhabra, M.L. Yadav, T.P. and Guota, S.C. – 1982 – Effect of the season of sowing on the productivity of sunflower. Ind. J. Agric. Sci. 52:107-112.
13. Collis –George, N and sands Jocelyn, E – 1959 – The control of seed germination by moisture as a soil physical Aust. J. Agr. Res. 10: 628-637.
14. Dabre, W.M. and Bang, S.R. – 1985 – Physiological analysis of yield variation in sunflower (Helianthus annus) genotypes. PKV. Ros. J. 9:19-22.
15. Datta and Adhikari – 1972 – Proc. Symp. "Clay Minerals in Indian soils." Indian Mat. Sci. Academy, New Delhi.
16. Daubenmire, R.F. – 1974 – Plants and Environment (3^{rd} edn.) John wiley and sons, Ney york.