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Plant Introduction in Tamil Nadu—on the Performance of *(Dichondra repens)* Forst* (Lawn Leaf)

by

V. RAMAKRISHNAN[1] and K. P. VIJAYAN[2]

Introduction: *Dichondra repens* is said to be introduced into California from West Indies and extensively grown as a pleasing cushion-like, green ground cover in parks and gardens in U. S. A. (Bailey and Bailey, 1959; Wilson, 1960; Youngner, Nudge and Spaulding, 1968). Its use in ornamental gardens and parks in our country for raising lawn or ground cover has not been reported previously. Trial was therefore, carried out with this species in order to critically evaluate its suitability to our country for this purpose.

(Fig. 1) is a pantropical species belonging to the family convolvulaceae. This species is very variable especially, in the length and shape of the petals, the shape of the leaves and in the pubescence (Wilson, 1960). The plant has an apparent resemblance to *Centella asiatica* Urb., a member of the family

FIG. 1. Showing the creeping and rooting habits of *Dichondra repens*, Forst.

*A recent suggested revision of the North American species (Tharp and Johnston, 1961) indicates that *D.micrantha* Urb. may be the more proper name.

1. Asst, Botanist and 2. Asst. in Botany, Agri. College and Research Institute, Coimbatore-3.

Umbelliferae, but is in no way related to it. The plant is a procumbent, perennial herb and possesses filiform, creeping, pubescent stems 15 cm to 30 cm long; leaves 1 cm to 3 5 cm in diameter, cordate-orbiculate or reniform, repand, pubescent or glabrescent above, sepals oblong or spathulate oblong, bluntish, nearly as long as the corolla; exceeded by the carpids; corolla yellowish white; bicarpellate fruits with one per carpel (Grisebach, 1864).

Materials and methods: The plants of this species were raised from seeds introduced (Accession No. 4427) in July, 1966 from the Great Western Seed Company, Albany, Oregon, U. S. A. The seeds were drilled in beds, in open sun at the Government Botanic Gardens, Coimbatore on 18—7—66. The beds were manured liberally with leaf-mould prior to sowing and were kept just moist throughout the period of germination. Besides, a small quantity of seeds was also sown in a bed, partially shaded under the canopy of rain tree *Samania saman* Merril) and Asoka or Mast Tree (*Polyalthia longifolia*) Hk. f. & T) with a view to evaluating its suitability to shady situations, under the drip of the leaves.

The plants were also raised vegetatively in soils with variable lime content ranging from low to copious, in order to find out the optimum soil conditions for its best performance in this tract where kunkar is mostly prevalent in the soils. The pH of these soils were moderately alkaline ranging between 8.1 and 8.8. The electrical conductivity of these soils ranged from 0 2 to 1.5 (Table 1).

TABLE 1. *Showing the soil reaction, elecrical conductivity and lime content of the soils tried for growing Dichondra repens Forst.*

pH (Reaction)	E.C. T.S.S.	Lime
8.4 M.A.	1.5 C	L
8.4 M.A.	0.4 H.S.	L
8.5 M.A.	0.3 H.S.	L
8.3 M.A.	0.3 H.S.	L
8.5 M.A.	0.3 H.S.	M
8.3 M.A.	<0.2 H.S.	M
8.5 M.A.	<0.02 H.S.	C
8.1 M.A.	<0.02 H.S.	C
8.4 M.A.	<0.02 H.S.	C

PM = Reaction
AC — Acidic
NL — Normal
MA — Moderately alkaline
MLK: Alkaline

EC (T.C.S.)
HS Harmless
C Critical
INJ Injurious

Lime:
L — Low
M — Medium
C — Copious

Pest affecting this species were also studied.

Results: The seeds shown under both the situations germinated on the third day and was over in the next fifteen days. The growth of the plants were more vigorous and rapid in the open bed and in the exposed portions of the bed, laid out in the partially shady situation. The plants under the latter situation remained stunted and putforth a few branches, forming sparse cover over the ground. Very thick, caushiony matress-like green sward was formed by the plants in the open in about 150 days from the date of sowing (Fig. 2). The plants grown with heavy application of leaf-mould and ammonium sulphate, produced large-sized leaves with long petioles. Those in soils of

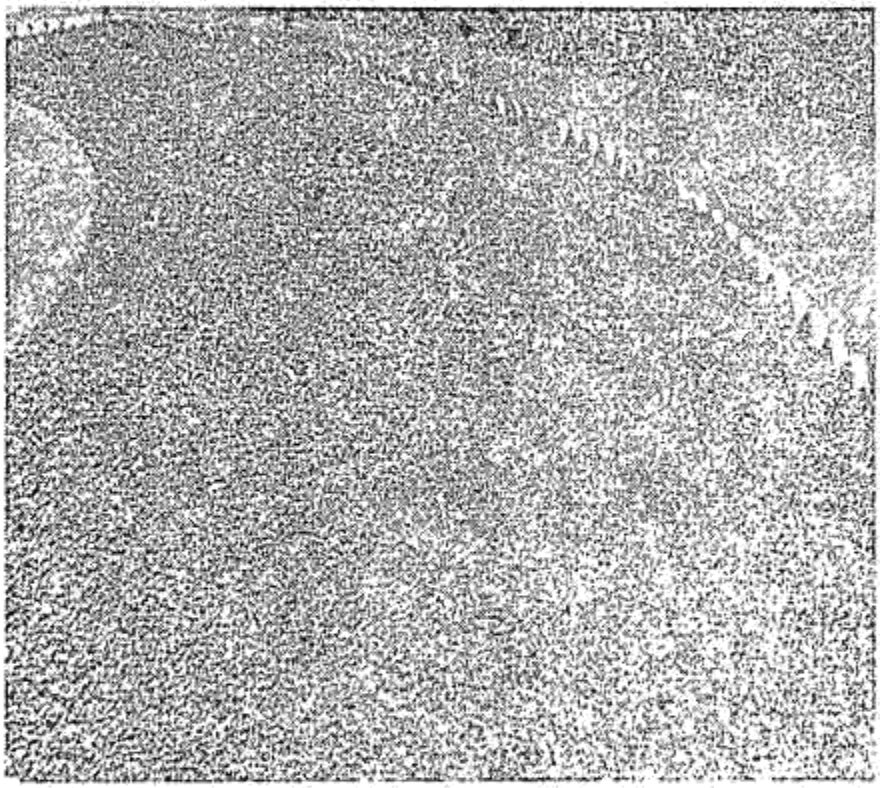

FIG. 2. Showing the thick cushiony matress – like greensward formed by *Dichondra repens* Forst.

low fertility and high electrical conductivity produced leaves with short petioles and reduced leaf blades which were less than half of the size produced by the plants under former conditions; the leaves were green or slightly yellowish in colour.

The performance of the plants in soils with copious lime content, on account of the presence of kunkar nodules in the root zone, was far better than of those in soils with low lime content. They revelled in the presence of lime without showing even the slightest sign of lime induced chlorosis. The growth was considerably accelerated by the addition of leaf-mould to soils rich in lime.

D. repens though growing at the site of introduction since July, 1966 had not flowered so far.

This species was found to be seriously affected by the root-knot nematode, Meloidogyne spp., wherever there was an enormous build up of this nematode population in the soil, the plants in those areas got infested. They turned yellow, wilted and dried up in patches. But those patches were observed to be completely covered up in about three to five weeks by the fresh ingrowths from the peripheral plants, following soil application with Nemagon, at the rate of 18 litres per hectare.

In addition to the nematode, the plants were affected by a leaf-eating caterpillar belonging to Noctuidae. This had perforated the leaves by extensively feeding on them, thus maring their alluring beauty. These could be controlled by spraying the plants with 0.02% folidol.

Discussion: *D repens* comes up well and forms a greensward or turf of distinctive charm in this part of the country. Its failure to flower in the tropical environment as ours is due to the prevalence of excessively high temperatures throughout the year (Youngner *et al*, 1968); this feature however, greatly facilitates the rapid establishment of lawns with its rooted sprigs. The growth habits studied under different conditions of the soil indicate that for its best performance liberal application of organic manure as basal dressing will be required. A prophylactic soil drench with nematicides like DD (1-3 dichloro propane and propene) or Nemagon may be necessary, if the soil is infected with root-knot nematode. Addition of lime to the soil where it is deficient may be useful for good results. This plant does not tolerate the drip from the leaves and is therefore, not desirable to plant it under the canopy of trees.

Summary: *Dichondra repens* was successfully introduced into our country for the first time in the year 1966 for the purpose of raising a greensward at the Government Botanic Gardens, Coimbatore.

The species revels in tropical soils rich in lime and humus, and multiplies rapidly by means of rooted stem bits only. It is highly suitable for raising turves in gardens and parks in open areas.

This plant is highly suitable for raising turves in gardens and parks even in alkaline soils with high lime content.

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Fixation of Phosphate and Potassium as influenced by Soil Type

by

R HASAN[1] and M. VELAYUTHAM[2]

Introduction : The primary, major elements, N, P and K play a prominent part in relation to the principles and practices of plant nutrition. Ironically enough, due to their 'fixation' in the soil to a certain extent, the availability of these elements to the crop is also affected to a certain extent by their fixation-release pathway, that is characteristic of a given soil. The ability to fix and release nutrients coexists in any soil although there may be marked degree of variation between soils. Studies of fixation of elements is of interest in clay mineralogy from the standpoint of structure and alteration of minerals and in soil-plant relationships in connection with their availability to plants.

The factors affecting the fixation of nutrients are both intrinsic and extrinsic. The parent material of the soil, clay content and its mineral make up, degree of saturation, pH and the organic matter level are some of the intrinsic factors. Some of the extrinsic factors which influence the determined fixing capacity of a soil are the type of salt added, the nature of coions, the concentration range employed, time of equilibration, temperature, moisture level and operations such as complete drying, alternate wetting and drying or drying and heating. The variation in fixing capacity of P and K by two contrasting soil types is discussed in this paper.

Materials and Methods : Gangetic alluvial soil sample from Delhi and black soil sample from Coimbatore were used. The samples were air dried, ground and passed through 1 mm sieve.

1 & 2 Division of Soil Science and Agricultural Chemistry, I.A.R.I., New Delhi-12.