

A preliminary study to explore potential of *Lotus corniculatus* L (Birdsfoot trefoil) in Palampur (Himachal Pradesh, India)

SINDHU SAREEN and INDER DEV

Indian Grassland and Fodder Research Institute, Regional Research Centr, CSKHPKV Campus, Palampur 176062 (H.P.) India

Lotus corniculatus L (Birdsfoot trefoil), a forage crop, still longers to be explored for its potential. In eastern North America, it has emerged from an introduced weed in 1920s to become a highly successful forage crop (Grant and Marten, 1985). In NewZealand also its introduction into unimproved pasture has increased animal output, as it is non-bloating (Jones and Lyttleton, 1971) and is palatable in all seasons up to flowering (Armstrong, 1974). Its nutritive value compares favourably with other legumes when grown under good conditions (Waghorn and Shelton, 1992). Besides, it is better adapted than white clover to soils that are poorly drained, droughty or of low fertility (Hopkins et al., 1994). Despite all these advantages associated with it, no attention has been paid to popularize this crop. Therefore, a preliminary study was undertaken at this centre to explore the variability in native populations of *Lotus*.

Material and Methods

Seven populations of *Lotus corniculatus*, growing in and around Palampur, were identified for study. The details of these populations are given in table 1. these populations were studied for morphological parameters like no. of branches/plant, size of branch, no. of leaves /branch, no. of flowers/ branch, pods/ plant, seeds/ pod, s[read of the plant, root length, nodules/ root and biomass production. Five plants were marked in each population to record observations. In each population, five quadrates of 1x1meter were marked and number of Lotus plants in each quadrate was counted and biomass production was recorded. All the data was subjected to routine statistical analysis.

Results and Discussion

The data collected on various morphological parameters is given in tables 2 and 3. All the populations under study were prostrate and the plant spread ranged from 10 to 24 cm and plants in populations III and VII had maximum spread of 19.3 and 19.1cm. The plant count per quadrate ranged from 5 to 22 and average no. plants/ quadrate were maximum in population VII, being 19. Maximum no. of branches/ plant was recorded in population IV. The branches were 10cm (population I) to 17.3cm (III) long. Each branch was bearing 4 (V) to 7.2 (I) leaves and 0.6 (VI) to 1.8 (VII) flowers. Each plant had 21.4 (I) to 61.2 (VI) pods and each pod had 12.1 (IV) to 15.3 (V) seeds.

The root length varied from 5.9cm (II) to 11.6cm (III) and no. of nodules/ root varied from 0.6 in population IV to 4 in population III. The dry biomass of a plant ranged from 3.7 gm (IV) to 17.8gm (VII) and below ground biomass ranged from 1.3gm (V) to 6.4 gm (VII).

The perusal of data reveals that significant variability among the populations was observed for all the parameters studied except leaves/ branch, flowers/branch, root length and nodules/root. Kelman and others (2003) also reported that genetic variance component for herbage yield, plant height and condensed tannins was significant in *L.pedunculatus* and *L.corniculatus* populations. They also reported strong association of characters with their geographic origin. The present study also reveals that the populations growing in abandoned field and bunds bear higher average values for most of the parameters studied. If these populations are exploited further for introduction into degraded pastures, the pasture productivity can be increased.

References

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Table 1. Details of population sites.

S.No.	Site
I	Plum orchard
II	Open grassland
III	Field bund, near veterinary college, CSKHPKV, Palampur
IV	Field bund, CSKHPKV campus, Palampur
V	Protected grassland
VI	Abandoned field
VII	Abandoned field

Table 2. Data on morphological parameters in *Lotus corniculatus* populations.

Site	Plant spread (cm)	No. of tillers/plant	Length of tiller (cm)	No. of leaves/branch	No. of flowers/branch	No. of pods/plant	No. of seeds/pod	Root length (cm)	No. of nodules/root
I	12.6	4.6	10.0	7.2	1.6	21.4	12.3	9.8	2.6
II	16.6	5.0	10.3	5.6	1.4	22.4	14.3	5.9	2.8
III	19.3	5.0	17.3	6.6	1.4	24.4	14.8	11.6	4.0
IV	17.0	6.4	13.0	4.6	1.2	58.0	12.1	8.4	0.6
V	14.2	4.6	11.4	4.0	0.8	45.4	15.3	7.4	3.6
VI	14.8	3.4	13.6	5.2	0.6	61.2	12.8	8.0	1.6
VII	19.1	5.0	15.9	5.2	1.8	55.4	14.4	10.7	3.6
CV%	19.43	43.09	26.13	40.44	78.22	31.83	13.08	38.58	92.88

Table3. Data on plant count/sqm and biomass production in *Lotus* populations

Site	Plant count ^{-m²}	Biomass/plant (g)	Below ground biomass/plant (g)
I	9.2	7.6	3.3
II	8.8	8.1	5.2
III	5.8	5.9	2.3
IV	14.0	3.7	2.0
V	13.4	4.2	1.3
VI	16.4	11.8	4.3
VII	19.0	17.8	6.4
CV%	20.77	22.29	50.6