were significantly superior in yield to the parent cultivar. Seed weight of the mutants was significantly higher (Table II) at all the locations and the seeds were bolder (Figs. 1*a*, 1*b*). The mean increase in seed weight was 22·3 (range 18–24) and 28·7 (range 20–45) per cent for TT–4 and TT–6 respectively. It may be emphasised that the crop duration of these mutant cultures was the same as that of T–21 (Table I).

All the early maturing high yielding varieties that have been recommended for cultivation[3] have invariably small seeds. Therefore, the main objective of the present investigations was to improve the seed size of an early cultivar without disturbing its yield potential. Seeds of these early, bold seeded varieties are now available for cultivation.

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INFLUENCE OF SPRAY OF THE CULTURE OF EPIPHYTIC MICROORGANISMS ON THE YIELD OF THE GRAM (*CICER ARIETINUM*)

SEN[2,3] obtained appreciable increase in the yield of wheat and paddy in pot experiment on spraying these crops with a culture of a common bacterial inhabitant of the phyllosphere of water hyacinth (*Eichornia crassipes* Mort Solms). Iswaran *et al.* obtained similar results with two varieties of paddy and one variety of wheat in microplots. A bacterium isolated from the leaf sheath of paddy and flower of water hyacinth also gave similar results. Since no work has been reported on the use of these organisms on legumes, an attempt has been made to see their influence on the yield of gram in *Rabi* 1978.

The pot culture experiment was carried out using Delhi soil (pH 7·2) with 5 replications for each treatment. Twelve kg of such soil were kept in each pot. A basal dressing of P_2O_5 100 kg/ha, zinc sulphate 12 mg, manganese sulphate 6 mg, ammonium molybdate 6 mg and borax 6 mg was given to the soil in each pot. Seeds of gram (*Cicer arietinum*) were inoculated with peat based culture, containing an efficient strain of *Rhizobium*. Uninoculated seeds were used as controls. The various treatments are listed in Table I. A uniform population of 4 plants in each pot was maintained upto maturation. Spraying was done thrice during the growth of the crop (i) at early seedling stage (ii) at vegetative growth stage and (iii) at early flowering stage. The grain yield was recorded and the data were analysed statistically. The results given in Table I have revealed that sprayings of the culture of these epiphytic bacteria significantly increased the yield of gram crop compared to N treated series. However, the treatments of foliar spray with the culture of bacteria isolated separately from the flower of water hyacinth and rice sheath were at par with 60 kg N. Inoculation with efficient strain of *Rhizobium* further increased the yield except in the case 60 kg N and with foliar culture treated series the effect was more pronounced Highest grain yield was recorded by spraying culture of the bacterium isolated from the rice sheath in *Rhizobium* inoculated series.

TABLE I

Effect of some epiphytic bacteria on the yield of gram var C–235

Treatment	Grain yield g/pot* (Average of 5 replications/ treatment)	
	Uninoculated	Rhizobium inoculated
0 kg N/ha	4·96	6·44
20 kg N/ha	5·42	6·70
40 kg N/ha	5·42	6·50
60 kg N/ha	6·42	6·22
Spray with Isolate 1	7·16	7·66
Spray with Isolate 2	6·22	7·02
Spray with Isolate 3	7·00	8·56
C.D. at 5%	0·635	

Isolate 1: from the phyllosphere of water hyacinth
Isolate 2: from the flower of water hyacinth.
Isolate 3: from rice sheath.
* Each pot contains 4 plants.

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