CHAPTER - I

INTRODUCTION
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Pulses are seeds of Leguminous plants which belong to the sub-family papilionaceae. The pulses contain more protein materials than other vegetable products and so they are nearer to the animal flesh in food value. They, are also rich in minerals and vitamin B. Pulses have a unique place in the Indian diet, because they provide a major share of protein and essential aminoacids. They are cultivated extensively in India, throughout the year, in rotation with cereal crops. They occupy 17 p.c. of the total area under cultivation. The major pulses grown in this country are greengram, blackgram, redgram, lentil, cowpea, chick pea and field pea. But the production of pulses in India is rather insufficient to meet the requirements of her population. The pulse production has been almost static during the last decade in India, while the population has been increasing unabated. This has led to a decreasing trend in the per capita availability of pulses in the diet from 70-80 grams in 1958-60 to 45 grams in 1980-81. According to FAO and
WHO estimates, the nutritional requirements, per capita per day are 104 grams.

Greengram (*Vigna radiata* L. Wilczek) locally known as 'moong' is one of the pulse crops cultivated by the farmers of Assam and this is also widely consumed by the local population. This crop is locally grown during the autumn/winter season (September to December). But the yield per unit area is found to be one of the lowest in India. The reasons for this poor performance may be due to the use of indigenous poor yielding varieties together with insufficient information regarding the various agro-techniques of its cultivation.

In India the crop fields remain generally fallow during the spring season (February to May). This period is characterised by high temperature, periodic light rains and low relative humidity. Therefore, there is minimum infestation of crops by insects, pests and diseases. With the availability of short duration and photo insensitive varieties of greengram, it is now possible to harvest a good crop by adopting suitable package of practices. Over 62 different types of greengram with variation in habit, leaf size, flower colour, pod colour and seed characters are now available in India.

Since some of the short duration varieties of this crop plant mature within 60-70 days, the land need
not be left fallow in the spring season. Many such areas in India have been already brought under cultivation of different green gram varieties. In the case of spring/summer crop of green gram, harvest consists of 2-3 pickings when pods turn black, after which the plants are ploughed into the soil to serve as green manure. But in the autumn winter crops, harvesting is done by uprooting the plants, when most of the pods turn black.

Scope of pulses in Assam:

The state of Assam has a peculiar food situation in relation to other states of India. The state is marginally surplus in its staple food crop which is rice; but there is an acute shortage of pulses. The production of pulses in Assam is hardly sufficient to meet even one third of the requirements of the population. So large quantities of pulses are imported annually from other states of India to meet the internal demand. There is, therefore, an imperative need for increasing the production and productivity of pulses in Assam.

There is ample scope in Assam for extending the area sown under green gram, which grows well in the state. The climate is also suitable for this crop. Besides, the crop appears to fit into the local crop rotation admirably
well. Therefore, it is quite possible to increase the yield per hectare of this crop by adopting improved methods of cultivation which includes optimum plant density, provision of adequate manures and fertilizers, proper soil management and use of improved varieties, irrigation and rhizobium culture. Since the crop fields remain fallow during the spring season (February to May) it is worth while to grow a short duration crop of greengram during this period. Even though the state Department of Agriculture and Assam Agricultural university have taken up some research work on greengram, it is necessary to augment information regarding the above mentioned aspects of cultivation with particular reference to the agro-climatic conditions prevailing in the Guwahati region of Assam. Keeping in view all the above mentioned facts, four field experiments were conducted to study the performance of four varieties of greengram. Three of these varieties were new and one was already recommended for cultivation in this region. One of the four experiments was conducted during the non-traditional season (February - May) and the other three experiments were conducted during the traditional growing season (September - December). The experiment in February to May period was intended to find out the production and productivity of this crop in fallow lands. Besides, it was also intended to assess the total productive potential from two crops of greengram.
per year from the same land. This experiment was, therefore, designed to find out the optimum sowing time together with the best variety suited for this season and also the irrigation requirements, if any. The other three experiments were conducted during the traditional sowing period, designed to produce higher yields by adjusting the population density and also by the use of NPK fertilizer mixtures. Rhizobium culture was used to find out whether it was possible to reduce the requirements of nitrogenous fertilizer without affecting the seed yield.

A brief outline of the four experiments is given below.

Expt.-I. Effect of three plant densities on four varieties of greengram.

Expt.-II. Effect of three dates of sowing and two irrigation levels on four varieties of greengram.

Expt.-III. Effect of four NPK fertilizer mixtures and two methods of their application on four varieties of greengram.

Expt.-IV. Effect of rhizobium culture together with five fertilizer mixtures (NPK) on two most promising varieties of greengram.

These experiments were conducted in the research farm of the Department of Agricultural Botany, Gauhati.
university, Assam, India during the calendar years 1981 and 1982.