INTRODUCTION
CHAPTER 1

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Choice of chickpea and mustard as a test crops needs no emphasis as chickpea among pulses and mustard among oilseeds are the major rabi pulse and oilseed crops, respectively and grown over an area of about 63.2 lakh hectare and 60.7 lakh hectare in the country. (Anonymous, 2001).

Protein, oil and fats are the essential component of balanced nutrition for man along with carbohydrates, minerals, vitamins and curde fibre for normal health. But in India, the per capita consumption of pulses and edible oilseed is about 23.9 kg and 8.7 kg per year thus the per day consumption of pulses and edible oil is only 38.1 g and 11.0 g respectively as against the minimum requirement of 160 g of pulses and 40 - 50 g vegetable oil and fats for balanced diet.

India is the largest pulses and oilseeds producing country of the world. Pulses and oilseeds were cultivated over an annual average of 237.47 lakh hectare and 255.74 lakh hectare area with an annual production of about 135.99 lakh tonnes and 202.77 lakh tonnes respectively during 1999-2000. (Anonymous, 2001). The level of productivity of both pulses and oilseeds in India is far below than the average productivity in the world. Among the two groups of crops, oilseeds play a vital role in Indian agricultural industries and trade. Oilseeds form the second largest agricultural commodity after cereals in India, sharing 14 per cent of the country's gross cropped area and accounting for nearly 5 per cent of the gross national product and 10% of the value of all agricultural products. About 14 Million persons are engaged in the production of oilseeds and another one million in their processing (Hegde, 2000). At present there is acute shortage of edible oil in the country.
as evident from the availability of edible oil per capita per day i.e. 11 g1 which necessitates the import of oil to the tune of about Rs. 1300 crores per annum (Kumar, 1997). This gap is likely to be further widened as the production has not achieved the pace of increased in population. The pulses on the other hand contain 20-25 per cent protein which higher than any other food crop, hence we have to exploit the pulses as a source of protein to meet the increasing demand of protein in Indian diet. The importance of pulses and oilseeds as quite obvious from the inclusion of these crops in the new 20 points programme.

The bulk of country edible oil production is derived from two major oilseeds namely groundnut and rape seed mustard which together account for 67.3% of total oil seed production in the country and 72.7% of the edible group. Rape seed mustard is the major oilseed crop grown in the rabi season which occupied 60.7 lakh hectares area with an annual production of 59.6 lakh tonnes during 1999-2000 (Anonymous, 2001). Uttar Pradesh account for about 15.9% of the total rape seed mustard grown in the country.

Besides oilseeds, pulses are also contribute a significant role in the agricultural economy of the country. Besides being rich in protein, they sustain the productivity of the cropping systems. Their ability to use atmospheric nitrogen through biological nitrogen fixation (BNF) is economically more sound and environmentally acceptable. Pulses account for roughly one fifth of the total area under food grain crops and contribute about one twelfth of the total food grain production in the country (Ashaana, 2000). Gram is one of the most important pulse crop which covers 27.1% area and 31.97% production of the total pulses. In Uttar Pradesh gram is major rabi pulse crop which is grown over an area of about 8.2 lakh hectares with an annual production of 7.8 lakh tonnes.

The above situation demands for an immediate increase in the total production of pulses and oilseeds. The production of these crops may be increased either by putting additional area under these crops or by increas-
ing productivity per unit area by the use of new agritechnology. The possibilities for increasing area under pulses and oilseeds are limited because these crops face a serious competition from high yielding cereals and pulses during rabi and kharif respectively. In increasing the area both price risk and yield risk show significant negative impact on pulse and oilseed crops. The most possible way for increasing total production in the countries like India is to increase per unit area yield of these crops which may be enhanced tremendously by growing mustard as additional crop with grain in intercropping system.

In intercropping the component crops are usually sow in parallel line, either in additional series or replacement series. It has been suggested to evaluate the risk to calculate the possibility of intercrops failure to produce a specified income in comparison with that of sole crops (Gautam, 1996).

In the present day agriculture a scientific approach of intercropping is being adopted under irrigated area with a view to enhance productivity. Higher productivity and returns in intercropping system depend on the selection of compatible crops and their planting density and geometry. The fertilizer schedule and weed management of these intercropping system may also vary from sole cropping owing to inclusion of crops of dissimilar nature.

The losses due to weeds are enormous about 30 to 50 per cent of the total loss in agricultural produce is attributed to weed alone. Intercropping also reduces the damage caused by weeds due to smothering effect. The magnitude of reduction in weed growth in the system depend largely on nature of crops, their relative proportion in the mixture and the spatial arrangement of the plants.

The success of an intercropping system both in irrigated and unirrigated conditions largely depends upon least competition among the component crops. Efficient use of moisture and nutrients can be expected only where
there is an effective control of weeds. The weed control schedules developed so far are mainly for pure crops and not for a cropping system as a whole.

Keeping the above points into consideration, a field experiment entitled, "Studies on Weed management in Chickpea/Mustard intercropping system", was conducted during the Rabi (Winter) season of 1998-99 and 1999-2000 at the farm of R.M.P. (Post-Graduate) College, Gurukul-Narsan, Hardwar (Uttaran Chal) with following objectives:

1. To compare the performance of chickpea and mustard in their pure and intercropping,
2. To study the yield advantage in chickpea and mustard intercropping system,
3. To compare the effectiveness of hand weeding and chemical weeding in chickpea and mustard intercropping,
4. To study the interaction effect of experimental factors.