INTRODUCTION

Wheat (*Triticum aestivum* L.) is one of the most important staple food as well as feed crops in many parts of the world. It is grown for human food and about 10 percent is retained for seed and industry. The Wheat contains nearly carbohydrates 70%, protein 12%, fat 1.7%, minerals 2.7%, fiber 2% and moisture 11.6%. Wheat is grown during winter season in India. It is the world’s second largest producer of wheat in India over an area of about 25 million ha and production is about 70 million tonnes with an average productivity of 26.5 q/ha. In Uttar Pradesh it rank first in area and production followed by Madhya Pradesh and Punjab. In Uttar Pradesh, wheat is grown over an area of 9.67 million ha with production of 23.58 million tonnes with an average productivity of 31.13q/ha.(Anon….)

In wheat-based intercropping system, selection of an appropriate intercrop having desirable plant type and growth pattern which does not coincide with the peak period of growth of main crop is important, as research on intercropping has indicated how niche differences in crop species can lead to resource capture and conversion leading to increase biological efficiency and yield advantage (Willey, 1979).

Intercropping has been popular farming practice from time immemorial. This concept has however, changed over the year. On one hand it serves the purpose of risk covering practice in tradition bound agriculture to make up a part of crop loss in rainfed and dry land tracts while on the other hand this practice has opened up possibilities of enhancing returns under multiple cropping patterns in irrigated area. One such system is intercropping of oilseeds with wheat, which is one of the principal food crops of India. The practice of intercropping offers an opportunity for an efficient utilization of light, water, land and other inputs. As compared to sequential cropping and relay cropping, the practice of intercropping is known to increase the total productivity, because, the crops are able to utilize different resources at a time (Willey, 1979). The nutrients use in wheat + mustard intercropping system is usually based on requirement of both the component crops (wheat and mustard) and the availability of nutrients from a common pool, though they have different requirements.

Oilseeds constitute an important group of crops next only to cereals. Mustard is one of the major oilseed crops in semi arid areas in India. It occupies prominent place
next to groundnut with respect to both area and production. It is grown in tropical as well as semi temperate zones and requires cool and dry weather during its growth period. The seed and oil are the most economic parts in mustard, the seed and oil can be used as condiments in preparation of pickles and for flavoring curries and vegetables. In northern India, oil is predominantly used for human consumption in cooking and frying purposes, and also used for preparation of hair oils, medicines, soap making, manufacture of greases. The oil cake is used as cattle feed and as manure, the green stems and leaves are a good source of green fodder for cattle. Among different oil seed crops, the mustard accounts for 24.7 percent of area (7.1 m ha) and 27.5 percent of production (7.6 mt) with a productivity of 977 kg ha$^{-1}$. The important mustard growing countries in the world are India, Canada, China, Pakistan, Poland, Bangladesh and Sweden. In India, its cultivation is mainly confined to the states of Uttar Pradesh, Rajasthan, Madhya Pradesh, Haryana, Punjab, Assam, Bihar, Gujarat and West Bengal. Among these Uttar Pradesh alone produces about 20 percent of total mustard production in India.

Normally fertilizer doses applied to wheat and mustard intercropping system are based on the requirement of wheat crop, this may affect the nutrient uptake of both crops as they have to drive their nutrients requirements from a common pool. Therefore, the present investigation was under taken to find out the nutrients uptake by wheat and mustard an intercropping system under limited situation. The intercropping of wheat and mustard is an age old practice particularly in northern India for the needs of oil and grain both. Due to change in demand and price scenario of mustard seed and wheat grain, currently intercropping may be boon to produce higher yield per unit area, in turn generate more income under specific row ratio as replacement series in wheat and mustard. At present, row intercropping has been proved to produce higher yield advantage over mixed cropping. If recommended row ratio for specific area is adopted then farmers could utilize available resources more efficiently and effectively on sustainable basis. But the variation in row combination, growth and development of both the component crops ultimately affects the yield attributes and yield. The suitable and appropriate row combination is varying from place to place due to change in climate, farming practices and varieties of crops cultivation. The research avenue is adequate with wheat + mustard intercropping in relation to management of irrigation,
fertilizer, genotypes and crop geometry. The studies of crop competition behavior, growth, development and yield attributes by using advance agro-technique in order to assess thoroughly cause and reason behind high yield advantage is lacking. Therefore, the present investigation was undertaken to find out the nutrients uptake by wheat and mustard intercropping system at Crop Research Farm, Department of Agronomy, Sam Higginbottom Institute of Agriculture, Technology and Sciences, Deemed to be University, Allahabad with following objectives:

1. To study the effect of different row ratios on the growth, yield of wheat and mustard.
2. To study the effect of different fertility levels on the growth, yield of wheat and mustard.
3. To study the interaction effect of row ratios and fertility levels on the growth and yield of wheat and mustard.
4. To study the economics of different treatment combinations.