



# Intercropping of Mentha (*Mentha arvensis L.*) in Bed Planted Wheat (*Triticum aestivum*) in Rampur District of Uttar Pradesh.

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## ABSTRACT

The present study was undertaken to compare the yield of bed planted wheat intercropped with two varieties of *Mentha arvensis*. The field experiment was conducted at KVK farm and at 5 farmers' field in the district. Four treatments were studied viz. T1, wheat crop sown with seed drill. T2, wheat sown on raised bed. T3, wheat + mentha (variety Simsaryu1) on raised bed and T4, wheat + mentha (variety kosi) on raised bed. The results revealed that bed planted wheat resulted in 10.2 per cent higher grain yield over traditionally sown wheat crop with seed cum fertilizer drill. Among the two mentha varieties, Simsaryu 1 resulted in higher herbage and oil yield compared to Kosi variety. The B:C ratio of bed planted wheat was 2.14 and under intercropping of wheat with mentha variety Simsaryu1 it was 2.84. Highest net return was also recorded with intercropping of bed planted wheat with mentha variety SimSaryu1.

**Key Words:** Bed Planting, Wheat, Mentha, Kosi, SimSaryu 1

## INTRODUCTION

Bed planting of wheat is being followed by a large number of farmers in Rampur district of Uttar Pradesh as it helps in better irrigation and weed management which leads to an increase in wheat yield over traditionally sown wheat crop. Therefore, intercropping in wheat raised on beds offers a good scope for increasing the productivity per unit area and income of the farmers. In bed planting system, wheat seed is sown on raised beds at 15 cm distance (three rows on 70cm beds). Mentha is coming up as a promising crop under the irrigated conditions in district Rampur. Menthol mint (*Mentha arvensis L.*) is menthol rich essential oil which is widely used in pharmaceuticals, cosmetics, flavour and confectionary industries. In recent years, India has become a major producer of *Mentha arvensis L.* oil and menthol in the world and now its share is around 85 per cent. Kosi is an early short duration (90-100 d) variety of menthol mint and produces higher oil content (0.8-1.0%) containing menthol (81-83%). However, recently released variety SimSaryu1 is of 100-110 d duration and contains oil (0.8-0.9%). Mentha seems to have a good

potential to become a substitute for summer paddy as it is an economically profitable crop. However, there is need to develop proper management practices to ensure good production of oil. Selection of variety is important factor influencing productivity of mentha grown in between the raised beds of wheat. Therefore, the present investigation was carried out to assess the performance of two mentha varieties grown as intercrop with wheat crop sown on raised bed in Rampur district of Uttar Pradesh.

## MATERIALS AND METHODS

The field experiment was conducted at Farm Science Centre (KVK) and five different locations of farmers' field in district Rampur during the year 2012-13. The experimental treatments were T1, normal wheat crop sown with seed drill. T2, sole raised bed wheat. T3, raised bed wheat + mentha (variety Simsaryu1) and T4, raised bed wheat + mentha (variety Kosi). The soil of the experimental field was sandy loam, pH 7.2 - 7.8, available nitrogen 150- 190 kg/ ha., available Phosphorus 16-22 kg/ha., available Potassium 180-220 kg and organic carbon 0.48- 0.56 per

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**Table1. Performance of Mentha Varieties intercropped with Wheat on raised bed.**

Treatment	Grain yield Wheat (q/ha)	Herbage yield Mentha (q/ha)	Oil yield (kg/ha)	Cost of cultivation (Rs/ha)	Gross return (Rs)	Net return (Rs)	B:C
Farmers' Practice	-	75.0	47.0	27,200	47,000	19,800	1.72
Normal sown Wheat	39.0	-	-	25,100	49,196	24,096	1.96
Bed Planted Wheat	43.0	-	-	28,100	60,200	32,100	2.14
Bed Planted Wheat + Mentha (Simsaryu1)	39.0	120.40	83	48,300	1,37,600	89,300	2.84
Bed Planted Wheat + Mentha (Kosi)	39.0	90	65	48,300	1,19,600	71,300	2.47

cent. Wheat variety PBW 550 was sown in the last week of November by bed planter (Three rows on 70 cm bed) using seed rate @100 kg/ha. The recommended dose of N:P:K was 160:60:40 kg/ha. was applied. Zinc was also applied through zinc sulphate @25 kg/ha. Nitrogen was applied in three equal splits at sowing, tillering and after harvesting wheat to mentha crop. One foliar application of water soluble fertilizer (19:19:19) was applied on both the crops. In wheat crop foliar application was done at 45d after sowing whereas in mentha, it was done 30 d after harvest of wheat crop. After second irrigation (45 DAS) to wheat crop, one row each of mentha variety Simsaryu1 and Kosi was sown between the raised beds with sucker rate of 250 kg/ha., no additional fertilizer was applied to mentha crop. Wheat crop was harvested during last week of April and mentha in the second fortnight of July. In order to control weeds, Pendimethaline 30 EC @ 1.0 kg ai /ha was applied within two days of wheat sowing. Under farmers' practice, sole mentha crop variety Kosi was transplanted after harvesting of wheat crop around 20 April and recommended dose of N:P:K i.e. 120:60:40 kg/ha. was applied for mentha crop. Oil content of mentha crop was extracted by steam distillation methods using Clevenger's type essential oil apparatus. Grain yield of wheat and herbage yield of Mentha were recorded and B:C ratio was calculated.

## RESULTS AND DISCUSSION

Bed planting of wheat crop helped in better irrigation of wheat crop. It also helped in better weed management in both the crops. Bed planted wheat recorded yield of 43 q/ha while wheat grown with traditional method using seed drill

recorded yield of 39 q/ha (Table 1). Bed planting of wheat gave 10.2 per cent higher grain yield over traditional method probably due to occurrence of better irrigation and weed management.

Under farmers' practice mentha crop was transplanted after harvesting of wheat in the second fortnight of April whereas for timely transplanting of mentha suckers, a separate nursery needs to be raised from January month. Therefore, in bed planted wheat, early planting of mentha was possible which resulted in higher herbage and oil yield. Therefore, intercropping of wheat with mentha variety Kosi resulted in 38 per cent higher oil yield over farmers' practice.

Under bed planting conditions, germination of mentha crop was observed in January end and very low vegetative growth of crop occurred till March due to low temperature but after harvest of wheat its vegetative growth increased. It was noticed that there was less competition between wheat and mentha crop due to the fact that less vegetative growth took place in mentha till March. The yield data showed that in bed planted wheat intercropped with mentha gave lower grain yield compared to sole bed planted wheat but the additional income from mentha oil increased the net return/ha. Among the varieties Simsaryu1 gave higher herbage yield of 120.4q/ha which was 30 per cent higher over Kosi variety. The oil yield of Simsaryu1 was 83 lt/ha and was 27.7 per cent higher over Kosi variety.

## ECONOMICS

Normal sown wheat recorded B:C ratio of 1.96, while bed planted wheat recorded B:C ratio

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of 2.14 (Table1). Among two mentha varieties grown as intercrop Simsaryu1 gave higher B:C ratio of 2.84. Under farmers' practice where sole mentha crop was raised after wheat harvesting, B:C ratio was 1.72. and was lower as compared to mentha variety Kosi grown under bed planted condition. Similarly higher B:C ratio of mentha cultivation was reported by Tuteja *et.al.* (2007).

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