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Performance of Black Gram as an Intercrop in Mango Orchard cv Himsagar

B. C. BANIK AND S. R. SINGH*

Department of Fruits and Orchard Management, Faculty of Horticulture, Bidhan Chandra Krishi Viswavidyalaya Mohanpur 741252, India
E-mail : romensenjam@yahoo.com
**Correspondence*

Abstract

An experiment on the performance of intercropping in mango orchard (cv Himsagar) was conducted to study the suitability and profitably with intercrop during 2009—2010. The age of the plant was 7 years old with a spacing of 10 × 10 m which provide the utilization of land space between the plant as intercrop. To observe the performance of intercropping on yield of the main crop mango comparing with the clean cultivation (control) and black gram as intercrop. Black gram was sown as intercrop with broad casting method without disturbing the root zone area in the dormant season of the main crop. The total area of intercrop was 28 m^2 between the inner space and total yield of 56.46 kg with an average of 201.6 g/m^2 was obtained. To observed the response of intercrop in the main crop mango, the average number of fruit / plant in mature stage was found (210.5) with intercrop and 202.6 fruits / plant in control (clean cultivation) respectively. The experiment revealed the positive correlation of black gram (leguminous vegetable) as an intercrop in the mango orchards without affecting the yield and more net income return in addition to the yield of the mango in young mango orchard.

Key words : Mango, Himsagar, Intercropping, Blackgram.

Mango (*Mangifera indica* L.) is one of the most popular fruit of the world, which occupies a prime position in the international fruit processing industry of the world. It is the most choicest and popular fruit among the people of orient and is designated as the king of fruits (1) because of its excellent flavor, attractive fragrance, beautiful shades of color and delicious taste with high nutritive value. Mango is part and parcel of the cultural heritage of India. No other fruit has such a remarkable records in literature, poetry, mythologal, legendry, history, art and sculpture as that of mango. West Bengal being a major mango producing state in India in terms of area and production and new mango plantations is also necessary every year. However, the initial investment is high to establish a mango orchard and beyond the economic reach of small and marginal farmers. In view of this, during the young age of the plant, growing of intercrops has been advocated to get some additional income. Information regarding effects of different intercrops on the growth and yield of mango plants are lacking in alluvial zone of West Bengal. However, some studies were conducted in other parts of the country (2—5). Apart from giving good returns, intercropping prevents weed growth, reduce nutrient loss through leaching and surface run off as reported by Bose et al. (6). Therefore, the present experiment was conducted with a view to study the suitability and profitability aspects of black gram as an intercrop for young mango orchard cv Himsagar.

Table 1. Treatment details where intercrop black gram was grown.

Intercrop with blackgram	Clean cultivation
T_1 + Blackgram	T_1 : 1000 : 500 : 500 g NPK /tree
T_2 + Blackgram	T_2 : T_1 + Zn (0.5%) + B (0.2%) + Mn (1%) + Ca (0.6%) as foliar application twice (Aug and Oct)
T_3 + Blackgram	T_3 : T_1 + Organic mulching (10 cm thick of dry leaves)
T_4 + Blackgram	T_4 : T_2 + Organic mulching (10 cm thick of dry leaves)
T_5 + Blackgram	T_5 : T_5 : $^1/_2$ T_1 + 50 kg FYM + 250 g *Trichoderma*
T_6 + Blackgram	T_6 : $^1/_2$ T_1 + 50 kg FYM + 250 g *Azospirillium*
T_7 + Blackgram	T_7 $^1/_2$ T_1 + *Azotobacter* (250 g) + 250 g *Azospirillium*
T_8 + Blackgram	T_8 : $^1/_2$ T_1 + *Azotobacter* (250 g) + 50 kg FYM

Table 2. Intercropping effect of yield on mango along with blackgram and clean cultivation.

Treat-meants	Total number fruits / plant (with intercrop)	Total number fruits / plant (clean cultivation)
T_1	189.0	89.5
T_2	230.5	209.0
T_3	177.5	199.0
T_4	142.5	223.5
T_5	218.5	213.0
T_6	317.0	260.0
T_7	238.0	210.0
T_8	171.0	216.0
Mean	210.5	202.5

(We are obliged to the Department of Fruits and Orchards Management, Faculty of Horticulture, Bidhan Chandra Krishi Vishwavidyalaya, Mohanpur, Nadia, West Bengal).

Methods

The experiment was laid in randomized block design with four replications during 2009—2010 and blackgram grown as intercrop in between the inner space of the plant with an age of 7 years old spacing 10 × 10 m which give sufficient space providing suitability for growing of intercrop. The site of the experiment Central Research Farm is situated at 22°57′ N latitude and 89°34′E longitudes with an average altitude 9.75 m above the mean sea level. The treatments details of the plant in each replication were intercrop with black gram given in Table 1. Out of four replication, two replication was grown as clean cultivation in the inner space of the tree and remaining two was grown with intercrop as black gram (variety T_9) in the inner space of an area of 28 m^2 (1 × 7) × 4. The land was ploughed thoroughly before the sowing of the crop and sown in November as *rabi* crop with broad casting method with the blackgram and harvested in January first week.

Results and Discussion

The intercropping area of the two replications of the treatments produced total number of fruits / plant 210.5) slightly higher yield production of mango fruits over the clean cultivation of 202.5 total number of fruits / plant as showed in Table 2. It was revealed that the yield of mango in early stages were not adversely affected by black gram intercropping. Besides, an additional income of 56.46 kg of black gram at of 201.6 g / m^2 was obtained in additional to the yield of mango (Table 3). Similar result was also reported by Jain et al. (7) that intercropping also influenced the number of panicles per tree, number of fruit per tree and yield of mango. Therefore, under the new alluvial zone of West Bengal the performance of black gram (variety T_9) in young mango orchard appeared to be economical without affecting the yield of the main crop mango cv Himsagar and apart from additional income it reduce the weed growth. The performance of blackgram from this result revealed that in the future farmer can grow blackgram as an intercrop for the young mango orchard.

Table 3. Yield data of blackgram (variety T_9).

Black gram variety	Method of sowing	Total area (m^2)	Total yield (kg)	Yield/m^2 (g)
T_9	Broad casting method	28	56.46	201.6

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