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Economics of chick pea (*Cicer arietinum* L.) influenced by land configurations and mulching

Archana B, Sampath O, Suneetha Devi KB and Ravi P

Abstract
Chick pea being an economically important crop, the management of the crop is neglected. To utilize the resources efficiently to conserve the moisture and to realize maximum yield benefits, a field experiment was conducted at Agricultural College, Polasa, Jagtial, PJTSAU, during *rabi*, 2019-20 to study the "Influence of land configuration and mulching on economics of chick pea (*Cicer arietinum* L.)". The experiment was laid out in split plot design with three land configurations as main plots and four mulching treatments as sub plots and are replicated thrice. The main plot treatments included were M_1-Flat bed, M_2-Ridge and furrow, M_3-Broad bed and furrow and sub plot treatments were S_1-Control, S_2-Sesamum mulch, S_3-Gliricidia mulch, S_4-Paddy straw mulch. Among the different land configurations, broad bed and furrows fetched higher gross returns, net returns and B:C ratio. Flat beds were found to be economically not profitable with lower gross returns, net returns and B:C ratio. Among mulching treatments gliricidia was found to be more profitable with higher gross returns, net returns and B:C ratio, while control is the least counterpart. But as far as B:C ratio is considered all the mulching treatments performed similar except control *i.e.* without mulch.

Keywords: Ridge and furrow, broad bed and furrow, gliricidia mulch, gross returns, net returns and b:c ratio

Introduction
Grain legumes are important source of diet for millions of people in developing countries. They are often referred to as poor man's meat. Chick pea is an economically important crop, with its production ranking third after beans and its mean annual production of 10 million tons, with major production contributing from India (Muehlbauer and Sarkar, 2018).
Legumes are grown as rotational crop after cereals due to its nitrogen fixing ability. Developing countries over the past few decades has stagnation in yields and production of grain legumes. In order to achieve the food security, agricultural research and development has been concentrated mostly on maximizing cereal yields and production. But, research focusing on grain legumes will have significant role in achieving nutritional security and soil fertility (Merga and Haji, 2019) [7].
Chick pea is considered as food legume, due to its multiple uses. The chick pea seed contain about 18-22% protein, 52-70% total carbohydrates, 4-10% fats, 6% crude fiber and 3% ash. Seeds are rich in minerals like phosphorus (340 mg/100g), calcium (190 mg/100g), magnesium (140 mg/100g), iron (7 mg/100g) and zinc (3 mg/100g). Its leaves contain oxalic and malic acids which are very good for stomach ailments. Chick pea is the best blood purifier and it also assists in lowering of cholesterol in the bloodstream. It is used in preparing a variety of snacks and sweets. Fresh green seeds are also consumed as green vegetable (Dharmendra Meena, 2018) [2]. Moreover chick pea has the potential benefits in curing the health issues related to cardiovascular, diabetic and cancer risks.
The recent hike in the prices of the grain legumes, they are being considered as the hardy crops which can tolerate the drought conditions. They are the most economically viable crops, which only needs a less but effective management practices in gaining maximum profits. Effective utilization of on-farm inputs and *in-situ* moisture conservation helps the chick pea in resource conservation and leads to maximum productivity.
Improper distribution of rainfall and insufficient supply of soil moisture may lead to the lower productivity of the chick pea. Management practices like land configurations and mulching helps to conserve moisture. The present study was conducted to evaluate the effect of different land configurations and organic mulching on gross returns, net returns and B:C ratio of chick pea (*Cicer arietinum* L.).

Material and Methods

An experiment was conducted in the field at Agricultural College, Polasa, Jagtial, PJTSAU, during *rabi*, 2019-20. The farm is geographically situated at an altitude of 243.4 m above mean sea level on 18° 50'37.0''N latitude and 78° 57'00.6''E longitude. It is categorized under Northern Telangana Zone of Telangana State. The experimental soil was sandy clay loam in texture, slightly alkaline in reaction and non-saline. The fertility status of the experimental soil was low in organic carbon content, low in available nitrogen, medium in available phosphorous and high in available potassium.

The experiment was laid out in split plot design with three land configurations as main plots and four mulching treatments as sub plots and replicated thrice. The main plot treatments included were M_1-Flat bed, M_2-Ridge and furrow, M_3-Broad bed and furrow and sub plot treatments were S_1-Control, S_2-Sesamum mulch, S_3-Gliricidia mulch, S_4-Paddy straw mulch. Where, ridge and furrows were laid with a row distance of 30 cm and furrow depth 15 cm, broad bed and furrows were laid with 90 cm of bed followed by 30 cm of furrow to a height 15 cm above the ground. Mulch was applied in the respective plots @ 10 t ha^{-1} with a thickness of 5 cm, which is sufficient to cover the soil from external conditions.

A chick pea variety NBeG-3 was sown @ 65 kg/ha, with spacing of 30 cm x 10 cm. Before sowing, the seed were treated with carbendazim + mancozeb @ 3.5 g kg-1 and was inoculated with rhizobium culture @ 200 gms per 8 kg.

The experimental data recorded was analyzed statistically by split plot technique and the significance was tested by F-test (Gomez and Gomez, 1984) [3] at 5 percent level of probability. While computing the economics, different variable costs of items were considered. The expenditure on seeds, fertilizers, plant protection chemicals and labour charges were considered at the prevailing market price. Gross returns were calculated by multiplying the grain with their respective prevailing market prices (4875/- per quintal) and presented as ₹ha^{-1}. The net returns were calculated by subtracting the cost of cultivation from the gross returns and presented as ₹ha^{-1}. Benefit- cost ratio was calculated for each treatment by using the formula. The gross income per hectare of each treatment was divided by the cost of cultivation of respective treatment.

Results and Discussion

The data regarding economics in terms of cost of cultivation, gross returns, net returns and benefit cost ratio as influenced by land configurations and mulching are presented in Table 1 and depicted in Fig 1. The variation in cost of cultivation between the treatments was mainly due to cost incurred in lay out of the different land configurations and in collection and application of mulch treatments in the field. The gross returns, net returns and B:C ratios were affected significantly by both land configurations and mulching.

Cultivation of chick pea under broad bed and furrow configuration recorded higher gross returns (₹70407 ha^{-1}), net returns (₹42788 ha^{-1}) and B:C ratio (2.55) which was due to higher seed yield (1444.3 kg ha^{-1}) and stover yield (2635.8 kg ha^{-1}). The cost of cultivation was also high for broad bed and furrow configuration treatment (₹27619 ha^{-1}). The results are in close proximity with that of Pranamik *et al.* (2009) [8], Jat *et al.* (2012) [4] and Joshi *et al.* (2018) [5]. This treatment was followed by ridge and furrow land configuration, where the cost of cultivation was same but the difference in gross returns (₹59789 ha^{-1}), net returns (₹32170ha^{-1}) and B:C ratio (2.16) was mainly due to the difference in the seed yield (1226.5kg ha^{-1}) and straw yield (2270.0 kg ha^{-1}). The low profit was obtained in flat bed conditions whose B:C was 1.75 despite of its low cost of cultivation (₹26669 ha^{-1}), gross returns (₹46687 ha^{-1}) and net returns (₹20018 ha^{-1}) due to lower seed yields (957.7 kg ha^{-1}).

Among different mulching treatments, gliricidia has performed better over other treatments in spite of its highest cost of cultivation (₹28608 ha^{-1}). Glircidia mulch fetched highest gross returns (₹66584 ha^{-1}) (seed yield -1365.8 kg ha^{-1}) and net returns (₹37975 ha^{-1}) with highest B:C ratio 2.32. This treatment was followed by paddy straw mulch (seed yield- 1252.4 kg ha^{-1}) with cost of cultivation (₹27408 ha^{-1}), gross returns (₹61053 ha^{-1}), net returns (₹33644 ha^{-1}) and B:C ratio (2.22) which was on par with gliricidia mulch for net returns, B:C ratio and it was followed by sesamum mulch (seed yield- 1160.9 kg ha^{-1}) with cost of cultivation (₹27608 ha^{-1}), gross returns (₹56594 ha^{-1}), net returns (₹28985 ha^{-1}) and B:C ratio (2.05), which was on par with paddy straw mulch for gross returns. Among mulching treatments, control treatment (seed yield- 1058.7 kg ha^{-1}) in spite of its lowest cost of cultivation (₹25583 ha^{-1}) could not result in higher gross returns (₹51613 ha^{-1}) net returns (₹26029 ha^{-1}) and B:C ratio (2.01) but was on par with sesamum mulch treatment for net returns and B:C ratio. This may be due to the cost actually incurred in the collection and application of the sesamum mulch which revoked the profits that can be gained through grain and stover yield. Under mulching treatments moisture conservation was better resulting in greater uptake of moisture and nutrient uptake by plant thus projected in yield and economics. Similar results were also reported by Bunkar *et al.* (2013) [1].

The interaction between land configurations and mulching was found to be non- significant.

Table 1: Cost of cultivation (₹ ha^{-1}), gross returns (₹ ha^{-1}), net returns (₹ ha^{-1}) and B:C ratio of chick pea as influenced by land configurations and mulching

Treatment	Cost of cultivation (₹ ha-1)	Gross returns (₹ ha-1)	Net returns (₹ ha-1)	B:C ratio
Main plot (Land configuration)				
M1-Flat bed	26669	46687	20018	1.75
M2-Ridge and furrow	27619	59789	32170	2.16
M3-Broad bed and furrow	27619	70407	42788	2.55
S.Em±	-	1713	1713	0.06
CD (P = 0.05)	-	6729	6729	0.24
Sub plot (Mulching)				
S1-Control	25583	51613	26029	2.01
S2-Sesamum@ 10 t ha-1	27608	56594	28985	2.05
S3-Gliricidia@ 10 t ha-1	28608	66584	37975	2.32
S4-Paddy straw @ 10 t ha-1	27408	61053	33644	2.22

S.Em±	-	1661	1661	0.06
CD (P = 0.05)	-	4936	4936	0.18
Interaction				
S.Em± (M x S)	-	2877	2877	0.10
CD (P = 0.05)	-	NS	NS	NS
S.Em± (S x M)	-	3024	3024	0.11
CD (P = 0.05)	-	NS	NS	NS

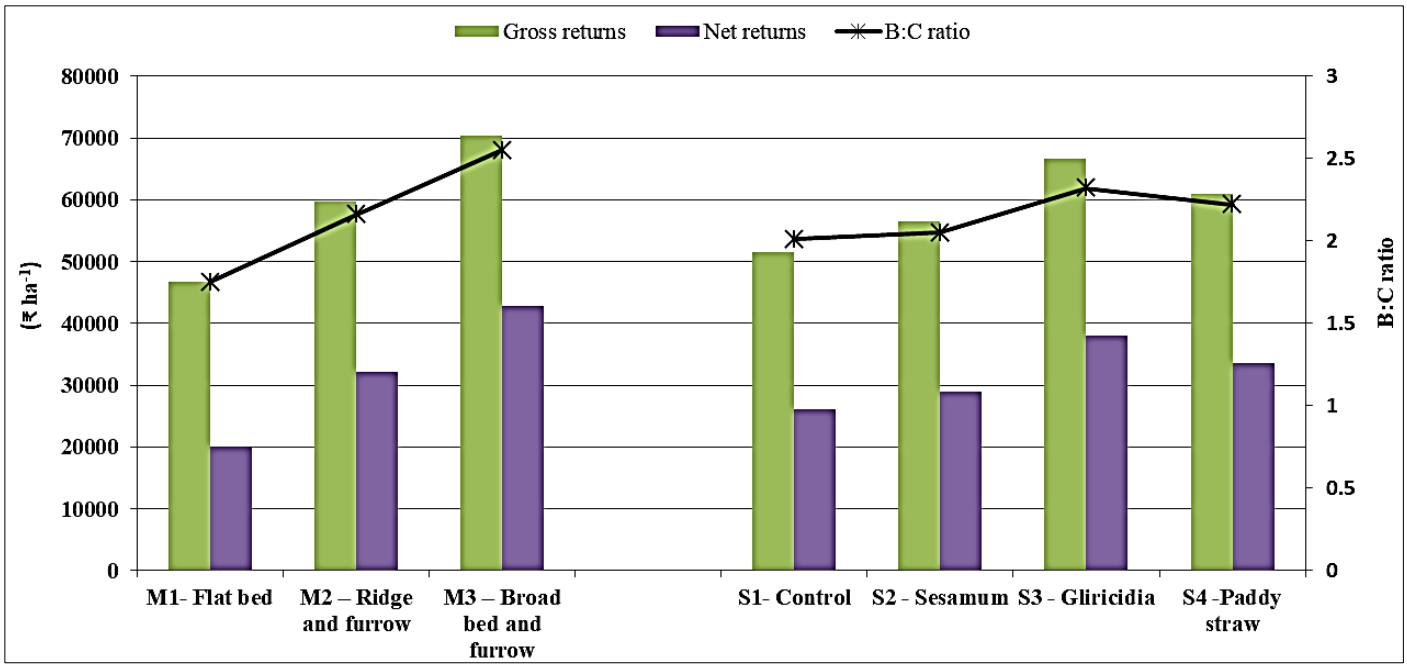

Fig 1: Cost of cultivation (₹ ha^{-1}), gross returns (₹ ha^{-1}), net returns (₹ ha^{-1}) and B:C ratio of chickpea as influenced by land configurations and mulching

References

1. Bunkar D, Singh RK, Choudhary HR, Jat AL, Singh K. Effect of row spacing and mulching on growth and productivity of mung bean (*Vigna radiate* L. Wilczek) in guava (*Psidium guajava* L.). Environment & Ecology 2013;31(1):160-163.
2. Dharmendra Meena. Studies on configuration and fertilization in chick pea + linseed intercropping system in *tarai* region of Uttarakhand. Ph. D Thesis. G.B. Pant University of Agriculture & Technology, Pantnagar, Uttarakhand, India 2018.
3. Gomez KA, Gomez AA. Statistical Procedures for Agriculture Research. John Wiley and Sons Publishers, New York 1984, 357-423.
4. Jat RA, Arvadia MK, Tandel B, Patel TU, Mehta RS. Response of saline water irrigated greengram (*Vigna radiate* L.) to land configuration, fertilizer and farm yard manure in Tapi command area of south Gujarat. Indian Journal of Agronomy 2012;57(3):270-274.
5. Joshi JR, Patel VM, Barad HL, Macwan SM, Ehsas J. Effect of land configuration and fertilizer management practices on growth, yield and yield attributes and economics of summer cowpea (*Vigna unguiculata* L.) under South Gujarat condition. International Journal of Current Microbiology and Applied Sciences 2018;7(1):1148-1155.
6. Mehlbauer FJ, Sarker A. The chick pea genome. Springer International Publishing AG. Cham, Switzerland 2017, 5-12.
7. Merga B, Haji J. Economic importance of chick pea: production, value and world trade. Cogent Food and Agriculture 2019;5:1.
8. Pranamik SC, Singh NB, Singh KK. Yield, economics and water use efficiency of chick pea (*Cicer arietinum* L.) under various irrigation regimes on raised bed planting system. Indian Journal of Agronomy 2009;54(3):315-318.