

Enhancing Productivity of Soybean Crop In Buldana District Using BBF Planter cum Inter Row Cultivator

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Abstract To enhance productivity of rainfed farming system, it should be accompanied by suitable soil and water conservation practices to mitigate moisture demand when needed. Rainfed Farming system has to eliminate two major rainfall conditions of dry spell which creates moisture stress and heavy rains which creates water logged condition hence there is a vast scope for broad bed furrow planting technique. An intervention has been taken and assessment has been conducted at KVK Jalgaon Ja. District Buldana to compare improved technology of BBF Planter with local farmer's practice of seed drill and study results revealed that increase in yield of soybean crop by 23.66 percent, additional net return of the farmers have been increased by 8525/- rupees per hectare.

Keywords - BBF, Soyabean Crop, Cultivator.

1. INTRODUCTION

Need:

As the agriculture depends heavily on rains, therefore risk is increasing. Erratic rains increases risk in rain fed areas. One of the biggest challenges in rain fed agriculture is crust formation. As there is little or no moisture in the soil coupled with low organic carbon make the top soil become hard for cultivation. Wind and water are the common factors contributing for soil erosion. Lack of proper erosion control measures leads to loss of top soil. A study reveals that on average every year 4 tons of top soil is eroded due to wind erosion. All most all rain fed soils are poor in organic carbon content, which is the important factor minimizing the productivity. Over exploitation of ground water to irrigate crops is another problem. Absence of ground water recharging aggravates the problem. Salinity and alkalinity due to accumulation of salts is another factor limiting the productivity levels.

Scope:

To enhance productivity of rainfed farming system, it should be accompanied by suitable soil and water conservation practices to mitigate moisture demand when needed. Rainfed Farming system has to eliminate two major rainfall conditions of dry spell which creates moisture stress and heavy rains which creates water logged condition hence there is a vast scope for broad bed furrow planting technique.

Importance:

Broad bed furrow planting is a new idea developed for conservation of water for dry land farming. The placement of seed at correct depth is very important for proper germination and for obtaining optimum plant population per unit area of the crop. Especially under dry land farming where soil moisture is at greater depth rainfed farming is often reduced due to the lack of soil moisture. It is necessary to adopt suitable technology to conserve the rain water in-situ to ensure adequate moisture during the various growing stages of the crop in rainfed farming.

2. REASONS OF LOW PRODUCTIVITY

Reasons of low productivity of the District

1. Improper plant population

Farmers are using bullock drawn seed drill and mostly tractor drawn seed drill for sowing of various crops seed but these implements have limitations of maintaining only row to row distance but plant to plant distance will not be maintain by these implements. Manual drilling on bullock drawn seed drill have more limitations which results in increasing cost in gap filling and uneven plant to plant distance.

2. Improper soil and water conservation practices

Application of in situ soil and water conservation practices suggest by KVK and state agriculture department was less adopted by farmers as they are yield intensive but while application farmer's feedback is they are labour intensive time consuming so most farmers don't follow the soil and water conservation practices

3. Unawareness about new technologies

Gaps in adaptation of improved technology

Based on various survey conducted by Krishi Vigyan Kendra and State Agriculture Departments following Gaps were identified

1. There is a gap in adoption of new planting technique as they use traditional sowing practice of sowing with bullock drawn implements and Tractor drawn seed drill.
2. Gaps in availability of proper seed metering implement.
3. Gap in awareness about in situ soil and water conservation practices.
4. Negative mind set about this technology as plant population will be reduced.

3. PROPOSED METHODOLOGY

Considering the gaps in adoption of improved technology and reasons of low productivity of the district, Krishi Vigyan Kendra Jalgaon Jamod has taken assessment to increase the production and productivities of major crops of this District. Krishi Vigyan Kendra Jalgaon Jamod has adopted the Technology of sowing of soybean crop on PKV Broad Bed Furrow planter developed by Dr. PDKV Akola.

Use of BBF Planter Developed by Dr. PDKV for various crop productions

Technical Information about the Implements:

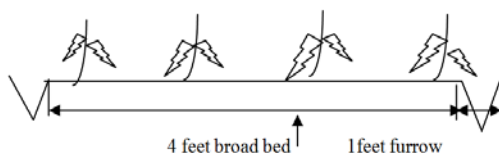
Dr. PDKV Akola developed BBF Planter is made of following components

- 1) Seed cum Fertilizer Box
- 2) Seed plate
- 3) Seed tubes
- 4) Furrow openers 02 no.
- 5) Tines 04 No.
- 6) Frame
- 7) Ground Wheel

Mechanism:-

Ground wheel drives chain drive connected to gear mechanism which rotates seed plates and assures continuous of seed maintaining plant to plant distance dropping through seed tubes and fertilizer through fertilizer mechanism.

Planting Technique



Seed Rate and Adjustments for different crops

Table.2 Seed Rate and Adjustments for different crops

Sr No.	Name of Crop Seed	Row to Row Spacing's	Seed Rate (kg/ha)	Plant Populations
1	Soybean	30 cm	60	266666

Net Return (Rs.) = Gross Return (Rs.) - Cost of cultivation (Rs.)

The ANR is computed as,

ANR (Rs.) = Net Return of IT (Rs.) - Net Return of FP (Rs.)

Seed Saving is computed as,

Seed Saving (MT) = Seed Required in FP (MT)- Seed Required in IT (MT)

Advantages of BBF Method

1. BBF method improves soil and water conservation of the field.
2. BBF Method works well in dry and wet spell. In dry spell it increases period of wilting of crop by making available conserved moisture and in wet spell it protect crops by draining excess water through furrows maintain proper soil water ratio.
3. It enhances fast rootlet growth as crop is being planted on bed, increasing no. of pod which ultimately results in increased crop production.
4. It improves crop aeration and sunlight results reduce insect pest attack on crops.
5. Inter row cultivator have an added advantage of mechanized intercultural operation n the field sown by BBF planter, thus reducing time of operation cost and labor.
6. Reduces labour cost of thinning and gap filling.
7. Open furrow can be well utilized for installation of sprinkler set.
8. Improves supervision of working operation during spraying due to reduce snake bite event in well grown crops.

5. RESULTS

Broad Bed furrow planter was tested for field trials through assessments in year 2015-16 for soybean crop and the

average performance parameters of last are shown below.

I. Assessment performance of broad bed furrow planter for soybean crop

Kharif soybean was planted on BBF technique under rainfed farming condition on 65 acres on 65 farmer's field and average data of different parameter was presented as below

Table No. 1: Results of demonstration of broad bed furrow planter for soybean crop

Parameter	Farmer Practice (Tractor Drawn Seed Drill)	Improved Practice (PKV BBF Planter Method)	Increase /Remark
Yield (qt/ha)	10.10	12.49	Increase by 23.66 %
Net Return (Rs)	35750.00	44275.50	ANR Rs. 8525 per hectare
Seed Rate (kg/ha)	75	60	Saving of seed 15.0 kg per hectare
Intercultural operation Labour Saving (man days/ha)	0.5	02	Labour Saving of 02 man day/ha per operation
Cost of operation(Rs/ha)	1250/-	1750/-	Higher than Farmer Practice
Field efficiency (%)	72.75	69.88	

Result revealed that, yield of soybean crop increased by 23.66 per cent by intervention of PKV BBF planter practice as compared with farmers practice by ANR of Rs. 8525/- per hectare. Seed saving of 20 per cent per hectare was also achieved. PKV BBF planter cum inter row cultivator is associated with inter row tines for intercultural operation which helped in labour saving of one and half man days per hectare during each operation.

6. CONCLUSION

- The broad bed and furrow planter developed by Dr. PDKV increases crop Yield of soybean 23.66 per cent.
- Farmer's additional net return gained for soybean crop is increased by rupees 8525/- per hectare.
- Seed saving of soybean crop is 15 kilograms per hectare respectively.
- Field efficiency was found lower and cost of operation found higher as compared to indigenous farmers practice.

7. FUTURE SCOPES

The yield potential of the district production will be increase by 127974.3 MT per cent or else otherwise the area under production can be reduced.

Table No. 3 projected yield potential of the district

District Area under cultivation (ha)	District Av. Production (MT)	* Projected Av. Production (MT)	Increased in Production (MT)
355848	540888.96	668863.3	127974.3

The Seed saving of the district will be increase by 5337.72 Metric tons.

Table No. 4 projected seed saving of the district

District Area under cultivation (ha)	Seed Req. (MT)	*Projected Seed Req. in district (MT)	Seed Saving in district (MT)
355848	26688.6	21350.88	5337.72

REFERENCES

[1] Nilesh Waghamre & N.P. Talokar (October 2013), "Laboratory Testing of Broad Bed and Furrow Planter for Different crops" in International Journal of Agriculture Engineering Vol.6 Issue 2 page no. 502-508.

[2] RNAM Test Code and procedure for Farm Machinery Testing

[3] The Soybean Processors Association of India

[4] Talokar N.P., Gabhane A.T. and Umale S.M. Enhancing productivity through use of BBF planter in Buldana District

of Maharashtra. TB-KVK/BID:01/2016

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