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Evaluation of harvesting *Abelmoschus esculentus* (OKRA) with improved technology for profitable agriculture compared to traditional methods

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Abstract

The *Abelmoschus esculentus* pricking is a laborious and time consuming work causing drudgery to farm women. The present study 10 okra cultivating women farmers were selected from five different villages of Nagarkurnool district. The study was carried out for 3 years. In this a comparison of okra ring cutter with gloves and without ring cutter and gloves to harvest okra was studied and results shown as the total average harvest using traditional method was 10.25 kg/ hour where as with gloves and ring cutter is 16.7 kg/ hour. The average increase in harvest is 37.71 kg/ hour in the year 2016. In the year 2017 the total average harvest using traditional method was 07.99 kg/ hour where as with gloves and ring cutter is 13.0 kg/ hour. The average increase in the harvest is 38.61 kg/ hour. In the year 2018 the total average harvest using traditional method was 8.3 kg/ hour where as with gloves and ring cutter is 13.4 kg/ hour. The average increase in harvest is 39.71 kg/ hour.

Keywords: *Abelmoschus esculentus*, Okra, ring cutter, hand gloves

Introduction

Okra is known botanically as *Abelmoschus esculentus*. It's rich in protein, vitamin and minerals hence acceptable by many of the tribes in the country (Tindall, 1975) ^[1]. Okra is utilized as both fresh and dried forms and has an emulsifying properties which helps in preparation of emulsifying products (Douglas, 1982) ^[2]. Agricultural operations for both crop and animal production typically use repetitive motions in awkward positions and which can cause musculoskeletal injuries (Kirkhorn, *et al.*, 2010) ^[5]. Okra harvesting by farm women are tedious, tiring and time-consuming.

These tasks are performed manually or by traditional tools (Knives). Kitchen knife is usually used for harvesting okra. This traditional technique of using kitchen knife exposes the user to the danger of knife cut. The output of the traditional technique has been found to be low due to the drudgery of the process (Ogbobe *et al.*, 2007) ^[3].

According to reports of Meyers *et al.* 1995, musculoskeletal disorders (MSDs) might affect muscles, tendons, joints, nerves and related soft tissues anywhere in the body. Farm women face severe health hazards in picking *Abelmoschus esculentus* (Bhindi) (lady finger) in terms of cuts and wounds in hands, hardness of skin, blisters and abrasions.

Methodology

For the present study 10 okra cultivating women farmers were selected from five different villages of Nagarkurnool district. The study was carried out for 3 years. In this a comparison of okra ring cutter with gloves and without ring cutter and gloves to harvest okra was studied with reference to time and quantity of harvest.

Results and Discussion

In the present study the traditional way of harvesting Okra (knives and hand picking) to the modern ways of okra harvesting with use of ring cutter and knitted gloves were studied. In the year 2016 the total average harvest using traditional method was 10.25kg/ hour where as with gloves and ring cutter is 16.7 kg/ hour. The average increase in harvest is 37.71 kg/ hour. In the year 2017 the total average harvest using traditional method was 07.99 kg/ hour where as with gloves and ring cutter is 13.0 kg/ hour.

The average increase in the harvest is 38.61 kg/ hour. In the year 2018 the total average harvest using traditional method

was 8.3 kg/ hour whereas with gloves and ring cutter is 13.4 kg/ hour. The average increase in harvest is 39.71 kg/ hour.



Fig 1: Hands of farmers and farm women without using ring cutter



Fig 2: Hands of farmers and farm women with using ring cutter and hand gloves

Table 1: Comparative data of Okra harvesting in three years 2016-18.

Okra Harvesting in the year 2016.				Okra Harvesting in the year 2017.			Okra Harvesting in the year 2018.			
S. No	T ₁	T ₂	Percentage of increase in harvest	T ₁	T ₂	Percentage of increase in harvest	T ₁	T ₂	Percentage of increase in harvest	
1.	12	16	25	8.4	13	35.3	11	16	31.25	
2.	9.5	17	44.11	8	12	33.3	8	15	46.6	
3.	11	16	31.25	6	10	40	10	16	37.5	
4.	11	18	30.88	7	14	50	8	12	50	
5.	10	18	44.44	9	14	35.7	9	14	35.7	
6.	10	15	33.33	10	14	28.5	8	11	27.2	
7.	13	18	27.77	9	14	35.7	7	12	41.66	
8.	9	16	43.75	9	14	35.7	9	14	35.7	
9.	8	15	46.66	7	13	46.1	6	11	45.5	
10.	9	18	50	6.5	12	45.8	7	13	46	
Average	10.25	16.7	37.71	7.99	13	38.61	8.3	13.4	39.71	

T₁= Harvesting Okra (Bhendi) without ring cutter {Kg/hour}

T₂= Harvesting Okra (Bhendi) with ring cutter {Kg/hour}

Feedback of women on usage of ring cutter with gloves

- Convenient to use
- Comfortable to wear
- Reduced contact stress which was caused due to

conventional method

- Increased the rate of harvesting
- The material used for designing Bhendi cutter was stainless steel and is of less weight.

- Easy to perform the operation without any hindrances
- Increasing the efficiency of the worker

Conclusion

The results of present study shown that as the farm women are getting familiar to use gloves and ring cutter every years there is increase in harvesting which is similar to results of Gandhi *et al.* 2014^[4], which reported 40 percent increase in output of harvest and reduced health hazards with use of improved technology in *Abelmoschus esculentus* (Bhindi) picking

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