P-ISSN: 2618-0723
E-ISSN: 2618-0731

NAAS Rating: 5.04
www.extensionjournal.com

International Journal of Agriculture Extension and Social Development

Volume 8; Issue 3; March 2025; Page No. 232-234

Received: 12-01-2025
Accepted: 21-02-2025

Indexed Journal
Peer Reviewed Journal

Assessment of spiral grain separator for reduction of drudgery and improving work efficiency of farm women

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DOI: https://www.doi.org/10.33545/26180723.2025.v8.i3c.1719

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Abstract

An on farm trial was conducted by Krishi Vigyan Kendra, Chitrakoot to assess the use of spiral grain separator for drudgery reduction and improving the work efficiency of farm women. Twenty six farm women were selected from nearby village to assess the impact of improved tool over conventional practice. The acceptability of spiral grain separator by the farm women was collected by using five point scales starting from agree to disagree. The parameters *viz* number of farm women, time and cost involved in cleaning of grains were studied to compare the performance of spiral grain separator with existing method. The result showed that the spiral grain separator is the best as compared to traditional method as on an average of 2.5 q of grains are cleaned per hour with spiral grain separator by two farm women as compared to 0.29 q of grains cleaned per hour by hand cleaning with sieves/strainer. Manual grain cleaning is laborious, tedious and time consuming. The time taken by spiral grain separator to clean the different grains *viz*., pigeon pea, blackgram, greengram, chickpea and lentil was on an average 25.16 minutes as compared 3.49 hrs in manual cleaning. The cost of cleaning one quintal of grain has been found to be significantly reduced (Rs 31.25/ quintal) as compared to Rupees 261.75 per quintal in manual method. On an average 3.07 hrs time was saved by cleaning and grading of one quintal seeds by spiral grain separator.

Keywords: Spiral grain separator, cleaning, grading, drudgery

Introduction

In India, women perform the majority of agricultural works. The women in agriculture mainly use age old traditional tools and implements which are unsafe, hazardous, unhealthy, tedious and time consuming. Many operations are done in varying posture which often accelerates health related problems among them. Farm women perform hard physical work in sowing, planting, weeding, hoeing, irrigation, harvesting, threshing/processing, animal rearing and child bearing and rearing simultaneously. The farm women undergo hard physical drudgery, especially while transplanting rice in mud with bending position for a long times in rains and scorching suns, harvesting by bending with traditional sickle, weeding by hand in sun, rains and cold for a long hours, drying of produce standing in scorching suns, winnowing in dust and sun for a long time, with hard physical labour, dehusking/shelling, pounding, grinding of cereals, pulses by hand as well as hand operated chakki. Drudgery is generally conceived as physical and mental strain, agony, monotony and hardship, experienced by human beings. However, women report more fatigue than men. So, the plight of Indian farm women in this regard is alarming as they work for long hours without leisure, perform multiple roles in family and continued to be constrained by illiteracy, malnutrition and under employment. This fatigue concerns mental and physical fatigue, sleepiness, feeling tired or emotional exhaustion. Almost all farm women suffer from physical drudgery in various operations. They work as programmed robots destined for drudgery as they are deprived of technology access, health care access and employment alternatives (Desai et.al. 2021). The main motive of using women friendly tools is to reduce drudgery, save time, increase the productivity and improve the work efficiency. And there is a need to empower farm women with such technologies by organizing training programmes on use of these tools to promote and popularize them (Gurpdesh Kaur.,2017)

Keeping the above-mentioned fact in mind, the KVK assessed the use of spiral grain separator for cleaning and grading of grains for reducing drudgery and improve the work efficiency of farm women.

Materials and Methods

The present study was carried out on farm women in village Kuin of Pahari block in Chitrakoot district under On Farm Testing (OFT) program conducted by Krishi Vigyan Kendra. Twenty-six farm women were selected from nearby village to assess the impact of improved tool over conventional practice. The acceptability of the spiral grain separator was assessed by using five point scale i.e. from agree to disagree. The parameters *viz*., number of farm women, time taken to clean per quintal of seed, cost of cleaning seeds and time saving were studied to compare the performance of spiral grain separator with existing methods. Further, the efficacy of spiral grain separator was tested with respect to different types of grains/seeds.

Results and Discussion

Details of the existing method of cleaning/grading of grains: Focal group Discussions (FGD) with farm women in the village on existing method of cleaning/grading of grains revealed that both winnowing, hand cleaning with sieves/strainer methods are used to clean the grains at household by majority of the farm women. Almost 100 per cent farm women opined that they use winnowing method of cleaning grains. 73.08 per cent respondents' use sieves to clean the grains. However, only 11.54 per cent farm women admitted that cleaning/grading of grains is done by the before marketing.

Table 1: Details of the existing methods of cleaning/grading of grains for households purpose(n=26)

Particulars	Frequency	Percentage
Methods of cleaning grains at household level		
Winnowing	26	100.00
Hand Cleaning with sieves/strainer	19	73.08
Cleaning/grading of grains before marketing	3	11.54

The averages of different parameters of seed cleaning/grading by existing method and by spirap grain separator are shown in table 2. The observations showed that the average time taken to clean one quintal of pigeon pea seed by spiral grain separator was only 20 minutes. This was probably because of round shape and smooth surface of pigeon pea. To clean blackgram and greengram, the average time taken was 21 and 24 minutes as the grains are not exactly round in shape. Whereas, in case of chickpea and lentil, the grains have to be fed in spiral grain separator 3-4 times to clean completely. It took 28 minutes to clean chickpea and 32 minutes to clean lentil as the grains are not round in shape. These results are at par with the results of Dahimiwal et.al., (2017). According to him spiral grain separator reduces time required for cleaning/grading.

In the present trial, the results clearly reveal that the spiral grain separator is the best as compared to hand cleaning by sieves/ strainer as on an average 2.48 q of grains are cleaned per hour with two farm women without electricity. However, manual grain cleaning method is laborious, tedious and time consuming(0.29 q/hour). Thus, use of spiral grain separator reduces the labour and saves the time while cleaning and grading the seeds/grains. This result is at par with the results of Borkar et.al, (2016). Thus, the cost of cleaning of seed by manual method was calculated to be rupees 261.75 /quintal as compared to rupees 31.25/quintal. On an average 3.07 hrs time was saved by cleaning and grading of one quintal seeds by spiral grain separator.

Table 2: Comparison of different parameters between existing method and spiral grin separator

Crop	Farm women No.	Observation Points						Time Saving in cleaning by Spiral (hrs)
		Time taken (in minutes) for cleaning 1 q grain		Quantity of grains (q/hr)		Cost of cleaning (Rs/q)		
		Manual	Spiral	Manual	Spiral	Manual	Spiral	
Pigeon pea	2	192	20	0.31	3	240	25	2.87
Blackgram	2	214	21	0.28	2.86	267.5	26.25	3.22
Greengram	2	221	24	0.27	2.5	276.25	30	3.28
Chickpea	2	186	28	0.32	2.14	232.5	35	2.63
Lentil	2	234	32	0.26	1.88	292.5	40	3.37
Average		209.4	25	0.29	2.48	261.75	31.25	3.07

Acceptability of spiral grain separator by farm women: The acceptability of the spiral grain separator was assessed by using five point scale i.e. from agree to disagree (table 3). The farm women who have undergone the training were selected to study the acceptability of the tool. Majority of the farm women opined that the tool is light in weight, durable, drudgery reducing, time and labour saving device. However, the farm women told that the device is little bit inconvenient to use as it is too tall. The spiral grain separator was highly accepted and appreciated as a labour and time saving tool by the farm women. The similar results were also found by Desai and Sajjan (2017) [3] who disclosed that majority of the farm women accepted the spiral grain separator and opined that it is cost effective and drudgery reducing tool.

Table 3: Acceptability of the spiral grain separator (n=26)

Particulars	Agree	Partially agree	Neutral	Partially disagree	Disagree
Light in weight	4(15.38)	21(80.77)	1(3.85)	-	-
Durable	17(65.38)	5(19.23)	2(7.69)	2(7.69)	-
Drudgery reducing	26(100)	-	-	-	-
Saves time	24(92.31)	1(3.85)	1(3.85)	-	-
Noise pollution	17(65.38)	3(11.54)	2(7.69)	3(11.54)	1(3.85)
Expensive	5(19.23)	12(46.15)	-	4(15.38)	5(19.23)
Labour saving	21(80.77)	5(19.23)	-	-	-
Acceptability of the tool	21(80.77)	5(19.23)	-	-	-

Based on the results it can be concluded that use of spiral grain separator in cleaning and grading of grain is cost effective, labour, time and drudgery reducing farm tool. The use of Spiral grain separator for cleaning/grading of seed/grain takes each of the hard work out from the equation. On an average 3.07 hrs time was saved by cleaning and grading of one quintal seeds by spiral grain separator leaving farm women free to get on with other works. It is essential to empower farm women with drudgery and time saving tools.

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