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# Evaluation Of The Performance Of A Sunflower Thresher.

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**ABSTRACT:** This experiment was carried out in the workshop of the Department of Agric. Eng., Faculty of Agriculture, University of Khartoum during the period (November 2012- April 2013). Ripen heads of sunflower were put in six paper sacks 300 g in each sack to be threshed with this thresher. The concave of the thresher was adjusted by using different number of teeth in each row. Three teeth for every row were used for the first treatment, and two teeth for the second treatment for threshing 300 g of the heads. The parameters measured were: time of operation, fuel consumption, percentage of straw, material capacity and cleaning efficiency. When three teeth were used for the concave rows the time of operation, fuel consumption, percentage of straw, material capacity and cleaning efficiency were 2.93 minutes, 148.33 ml, 0.74%, 6.143kg/h and 99.26% respectively. When two teeth were used for the concave rows the time of operation, fuel consumption, percentage of straw, material capacity and cleaning efficiency were 1.14 minutes, 46.67 ml, 5.86%, 15.789 kg/h and 95.9% respectively. From these results it can be concluded that this thresher is capable of threshing the heads of sunflower crop when adjusting the concave by using three teeth in each row, as it gives more cleaning efficiency and less amount of straw.

**Keywords :** sunflower, heads, thresher, teeth, performance

## 1 INTRODUCTION

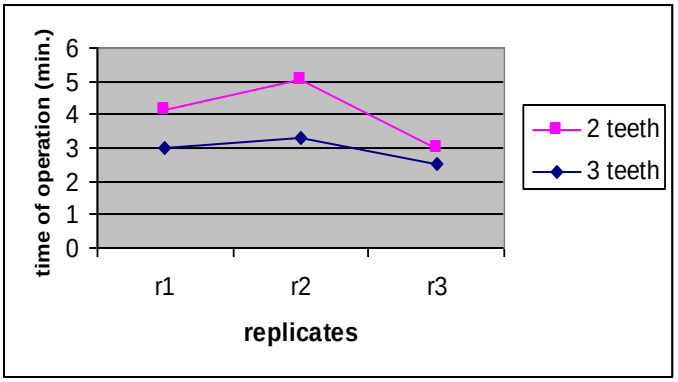
Farm machinery is an important and fundamental element for agricultural development and crop production in modern agriculture of many countries. Farm machinery significantly decreases the time required for farmers to accomplish farm tasks. A sunflower thresher was evaluated and tested by using different numbers of teeth in the concave. The time of operation, percentage of straw, fuel consumption, cleaning efficiency and material capacity was recorded from the threshing operation.

### Materials and method.

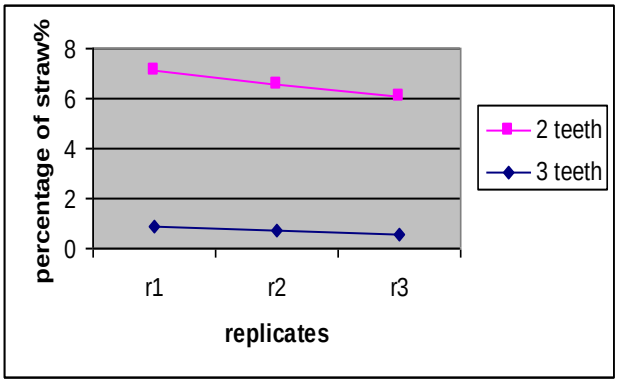
This experiment was carried in the workshop of agricultural engineering, faculty of agriculture, university of Khartoum (latitude 15° 40´ N and longitude 32° 32´ E). The machine used for threshing is an American made thresher with Briggs and Stratton petrol engine. The most important parts of the machine are: the engine, the drum, the concave, the sieve, pulleys and belts and the fan. The part in which some modifications are done is the concave. The concave is a movable part with movable screw nails act as teeth. The length of the concave is 365 mm with 4 rows of teeth. The equipments used include sensitive balance, a knife, paper sacks, stop watch, measuring cylinder and fuel container. The position of teeth may be changed according to the needed clearance. The teeth of the concave are adjusted by using three teeth in the row for the first treatment, and two teeth for the second treatment. Every treatment was conducted by 300 g of sunflower heads. The machine was operated to thresh this amount and the percentage of straw, fuel consumption, cleaning efficiency and material capacity were recorded.

### Results:

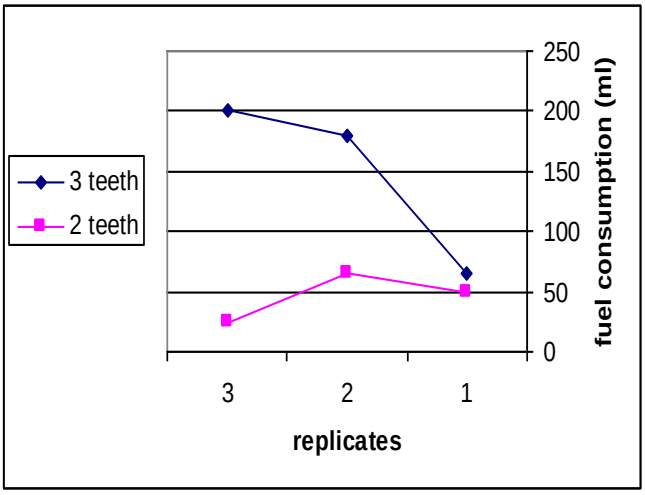
The chart below shows the comparison between 3 and 2 teeth concave for time of operation to thresh 300 g



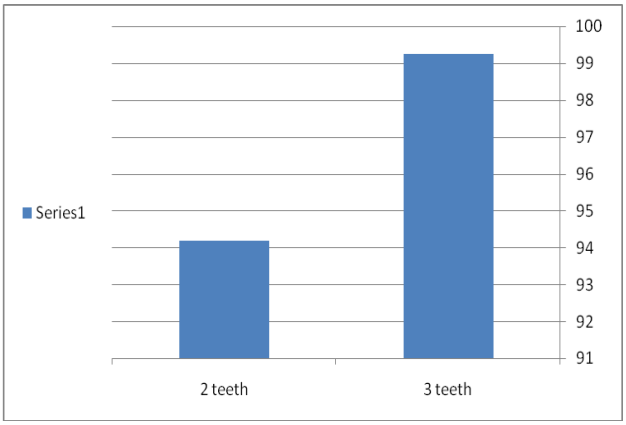

The chart below shows the comparison between 3 teeth concave and 2 teeth concave for the percentage of straw obtained:



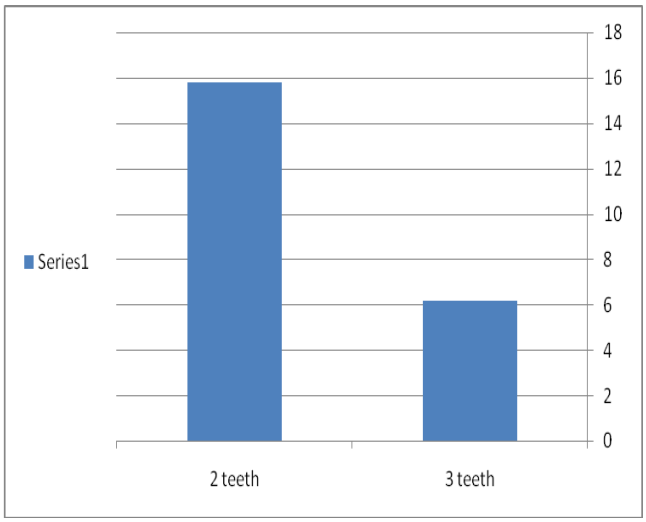

The chart below shows the comparison between 3 teeth concave and 2 teeth concave for the fuel consumption.




[1] The following chart gives a comparison between three and two teeth concave for the average of percentage of cleaning efficiency:




[2] The following chart gives a comparison between three and two teeth concave for material capacity




## Conclusion:

From the results of this study and from the analysis of these results the following conclusions can be drawn:

[1]. Number of teeth in each row in the concave has effect on the time of finishing the operation of threshing. Using two teeth the thresher spends less time than using three teeth.

[2]. There is no significant difference in consumption of fuel for 2 and 3 teeth concave.

[3]. The two teeth concave recorded high values for percentage of straw in the threshed seeds. There is a high significant difference between two teeth and three teeth concave.

[4]. Using the three teeth concave gives more cleaning efficiency.

[5]. The three teeth concave made less material capacity.