

# Design and Performance Evaluation of a Cassava Harvester Lifting Unit

290



## Abstract:

The research study employed the method of lifting to design a cassava lifting unit and its performance was evaluated using the power-take-off (PTO) of the tractor at 540 rpm speed and transmitted via the reduction gearbox of ratio 19:1 then to the driving mechanism (chain and sprocket) which drives the lifting discs to perform the third stage of harvesting cassava. The field test was conducted at the Federal University of Technology, Akure Ondo State, Nigeria teaching and research farm with one variety of cassava (sweet cassava). The tests were conducted at 1m interval spacing to evaluate the effect of different levels of parameters on the performance of the implement. Forward speed, depth of cut, and soil moisture content (clayey-loam soil) were the parameters that varied. The harvester was operated at forward speeds of 2.0 km/h, 4.0 km/h, and 6.0 km/h, depth of cut 30 cm, 32 cm, 34 cm, and soil moisture content of 15 %, 17.5 %, and 20.15 % (wet basis) using a moisture meter. The parameters kept constant were, soil type, variety of cassava, and lifting speed. The field capacity or harvesting rate which is the area harvested per unit time was also measured. The lifting efficiency is high at an optimum moisture content of 20 % wet basis. The optimum forward speed and depth of cut for an efficient lifting of the cassava was 4 km/h and 34 cm at 60 % moisture content and soil penetration resistance was taken on the first day twice (morning and evening) at different depths. The final reading was taken three days after which rain had fallen. The increase in lifting efficiency and percentage of tubers harvested was 75% at optimum forward speed and soil moisture. Thus, the result showed that there is an improvement in the harvesting approach and method. Keywords: Cassava, Harvester, Lifting, Unit, Optimisation, Optimum. Corresponding Author: bosemosunmola@yahoo.com

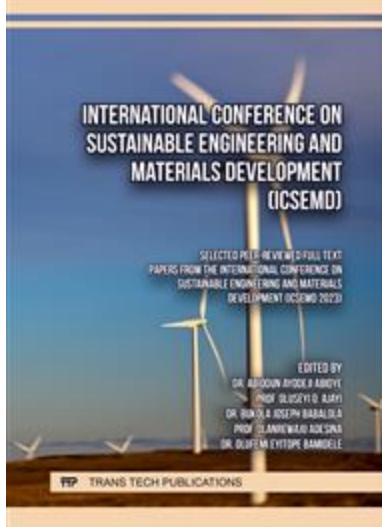
**Access through your institution**

Read The Paper

**You might also be interested in these eBooks**



VIEW PREVIEW



VIEW PREVIEW

## Info:

Periodical:

**Engineering Headway (Volume 2)**

Pages:

**57-68**

DOI:

**<https://doi.org/10.4028/p-tSxvt0>**

Citation:

**Cite this paper**

Online since:

**January 2024**

Authors:

**Bose Mosunmola Edun\*, L.A.S. Agbetoye, Oluseyi O. Ajayi, Enesi Y. Salawu**

Keywords:

**Cassava, Harvester, Lifting, Optimisation, Optimum, Unit**

Export:

**RIS, BibTeX**

Price:

**39,50 €**

Permissions:

**Request Permissions**

Copyright:

**© 2024 Trans Tech Publications Ltd. All Rights Reserved**

Share:

**LinkedInMendeleyEmailXTwitterWhatsAppTeamsSkypeOutlook.comShare  
Citing PublicationsSupportingMentioningContrasting**

**View Citations**

See how this article has been cited at [scite.ai](https://scite.ai)

scite shows how a scientific paper has been cited by providing the context of the citation, a classification describing whether it supports, mentions, or contrasts the cited claim, and a label indicating in which section the citation was made.

\* - Corresponding Author

**References**

**Cited by**

**Related Articles**

**FOR LIBRARIES**

**FOR PUBLICATION**

**INSIGHTS**

**DOWNLOADS**

• [ABOUT US](#)

[Redacted]

• [POLICY & ETHICS](#)

[Redacted]

• [CONTACT US](#)

[Redacted]

• [IMPRINT](#)

[Redacted]

• [PRIVACY POLICY](#)

[Redacted]

• [SITEMAP](#)

[Redacted]

• [ALL CONFERENCES](#)

[Redacted]

• [ALL SPECIAL ISSUES](#)

[Redacted]

• [ALL NEWS](#)



## OPEN ACCESS PARTNERS

© 2025 Trans Tech Publications Ltd. All rights are reserved, including those for text and data mining, AI training, and similar technologies. For open access content, terms of the Creative Commons licensing CC-BY are applied.

Scientific.Net is a registered trademark of Trans Tech Publications Ltd.