

# Effectiveness of cassava stem pruning for inducing delay in postharvest physiological deterioration (PPD) of fresh roots

By

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# Introduction

- **Cassava (*Manihot esculenta* Crantz)** is an important food for low-income populations
- It is a staple food raw material for many value added products
- Increasingly fresh root consumption is on the rise and projected to increase in Uganda
- However postharvest losses on the crop are high and estimated at over 25% in Uganda.
- Major cause of PH losses is PPD



## Post-harvest physiological deterioration

- PPD Manifests as blue-black vascular streaks in a ring along periphery/ sometimes vertically, off flavours and less palatable cassava products
- It occurs within 48 hours of harvest caused by production of phenolic compounds (scopoletin) induced at harvest by mechanical damage
- is the main cause of fresh cassava root losses



## PPD.....

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- Results in increased market rejects
  - Poor product yield and Market quality; Poor commercialisation possibilities
  - Significant economic losses (to farmers and retailers)
- ✓ Enhanced shelf life would result in increased fresh root market access and incomes from fresh cassava sales and increased food security at HH level
  - ✓ Thus need for effective and affordable technologies that can ensure enhanced root shelf life and assure fresh root quality

## Objectives of the study

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- To investigate the effect of cassava stem pruning on level of PPD of Ugandan cassava varieties
- To evaluate the effect of Pruning when combined relative humidity storage on cassava root shelf life

# Methodology

- Leaves were removed from 10 mature plants of six varieties including; Nyaraboke, Bao, Mercury, NASE 14, Tim tim and Hoima using a sharp knife. Another set of 10 plants for each variety were left un-pruned
- The plants were then left for 7 days
- After one week, both pruned and un-pruned plants from all the varieties were harvested and taken to the lab for analysis. Roots were washed dipped in fungicide (Ridomil) + surfactant sulsilwet Gold100% in (1 ml/ litre) for 2 minutes
- They were then analysed for PPD after 7 days
- Another lot was treated similarly but the roots were stored in high relative humidity bags (hermetic bags) for the 7 days prior to assessment for PPD
- Data was analysed using Excel

# Pruning process and root harvesting

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# Root assessment





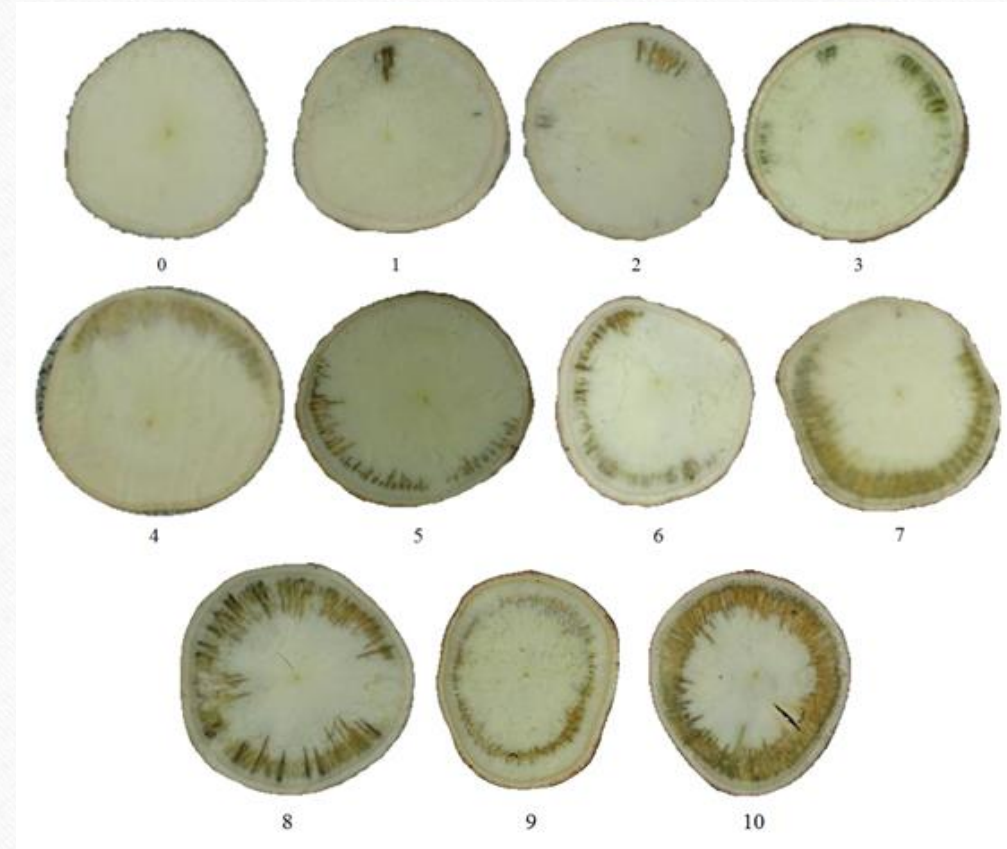
## Scoring PPD

Proximal end of the treatment root s  
was cut and covered

7 slices were assessed for PPD per  
root

Numerical values are assigned  
according to a scale of 0 to 10 on the  
proximal surface of each cut.

The scale values correspond to 0%,  
10% 20% 30% to 40% and so on  
corresponding to 10 up to 100%  
deterioration.

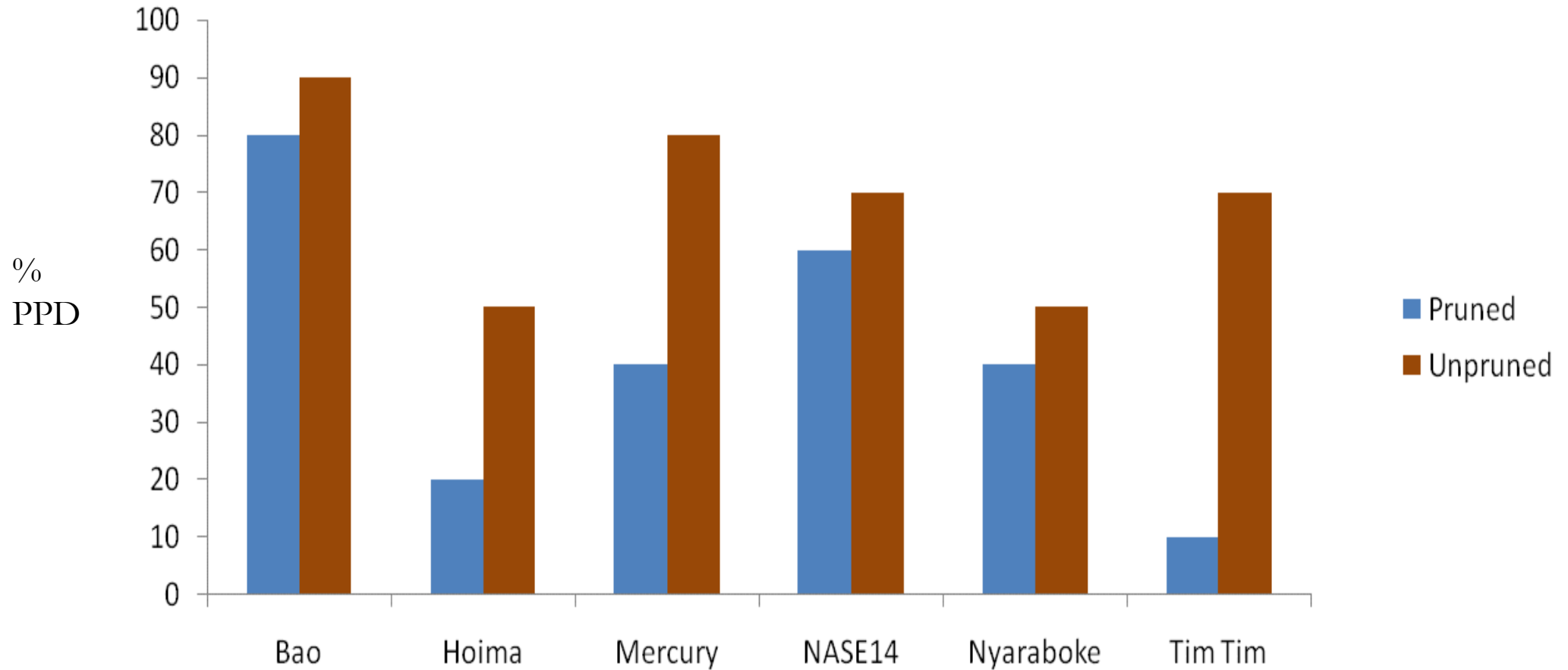


## Results

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- There was significant reduction in PPD on pruned compared to un-pruned cassava roots of the same varieties
- Pruning maintained root quality for over 7 days of cassava storage

## Effect of pruning on PPD levels

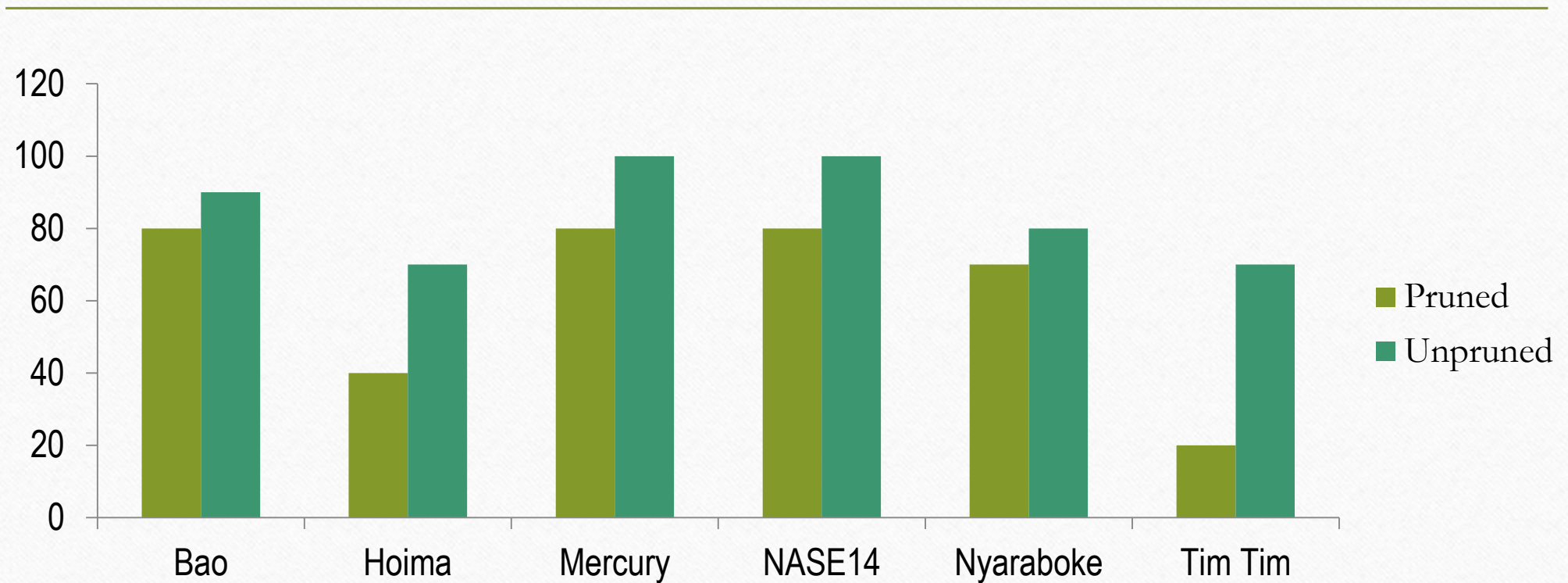


# Results

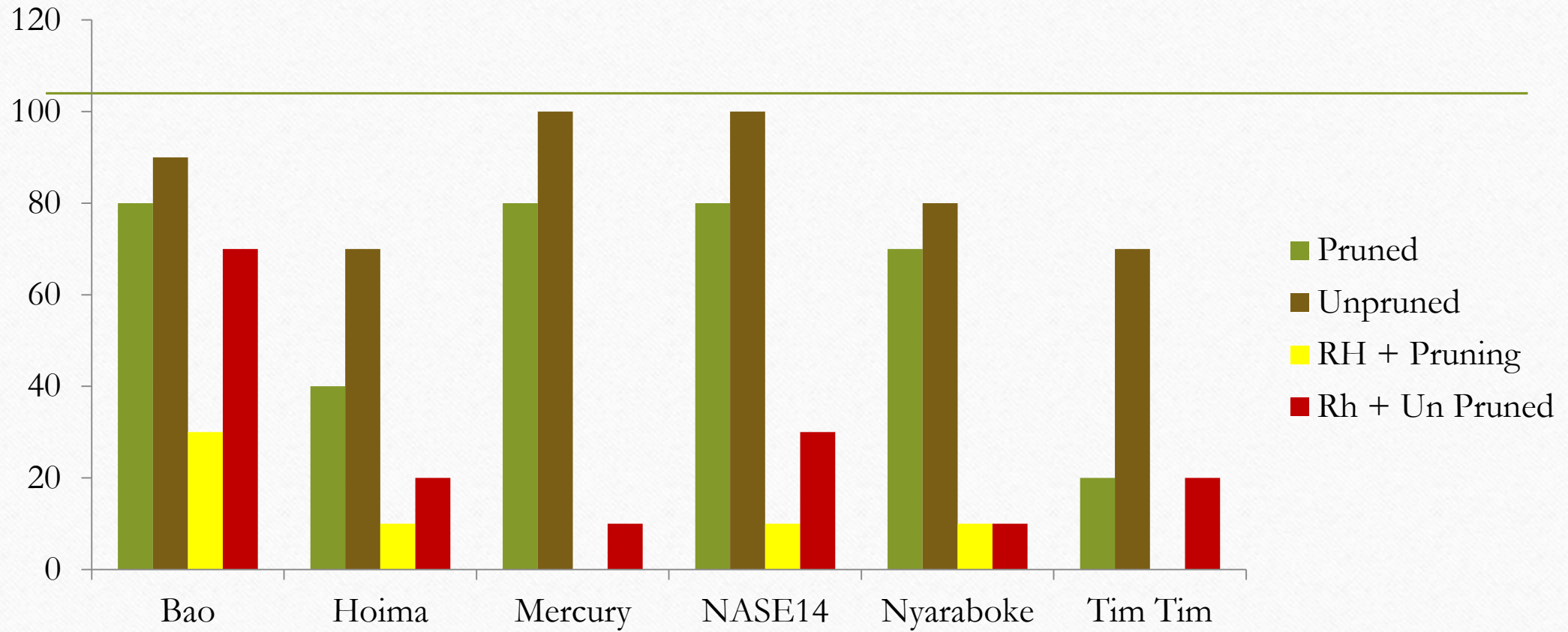
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## PPD effect after 14 days



## Effect of pruning + Relative humidity storage at 7 days



## Results..

- Thus pruning results in reduced PPD on cassava
- The effect was enhanced when roots were stored at high relative humidity conditions resulting in zero loss
- It resulted in increased sugar to starch ratio for -sweeter varieties
- Increased root shelf life
- Made roots more acceptable to consumers when tested up to 14 days of storage
- No specific changes in other properties especially cyanide
- These findings also those of confirm earlier studies on varieties in Latin America

## Implications....

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- Pruning thus can increase general output of fresh root cassava business
- Could result increased marketability of fresh roots especially at retail level
- Reduces postharvest losses and waste thus can increase HH food security
- Lowers cost of production



## Conclusion

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- Pruning significantly reduced the rate of PPD in cassava
- When combined with relative humidity storage can result in complete elimination of deterioration up to 2 weeks storage in some varieties
- It can thus be used to reduce the high economic losses caused by PPD especially at retail level

## Recommendations

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- ✓ More research to pilot this and other shelf life enhancing technologies needs to be done especially to pilot the technology at enterprise level
- ✓ Cost benefit analyses need to be done to evaluate the technology especially when combined with other shelf-life enhancing options

# Acknowledgements

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