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## Simple Sorghum Grain Quality Evaluation Procedures

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# SIMPLE SORGHUM GRAIN QUALITY EVALUATION PROCEDURES

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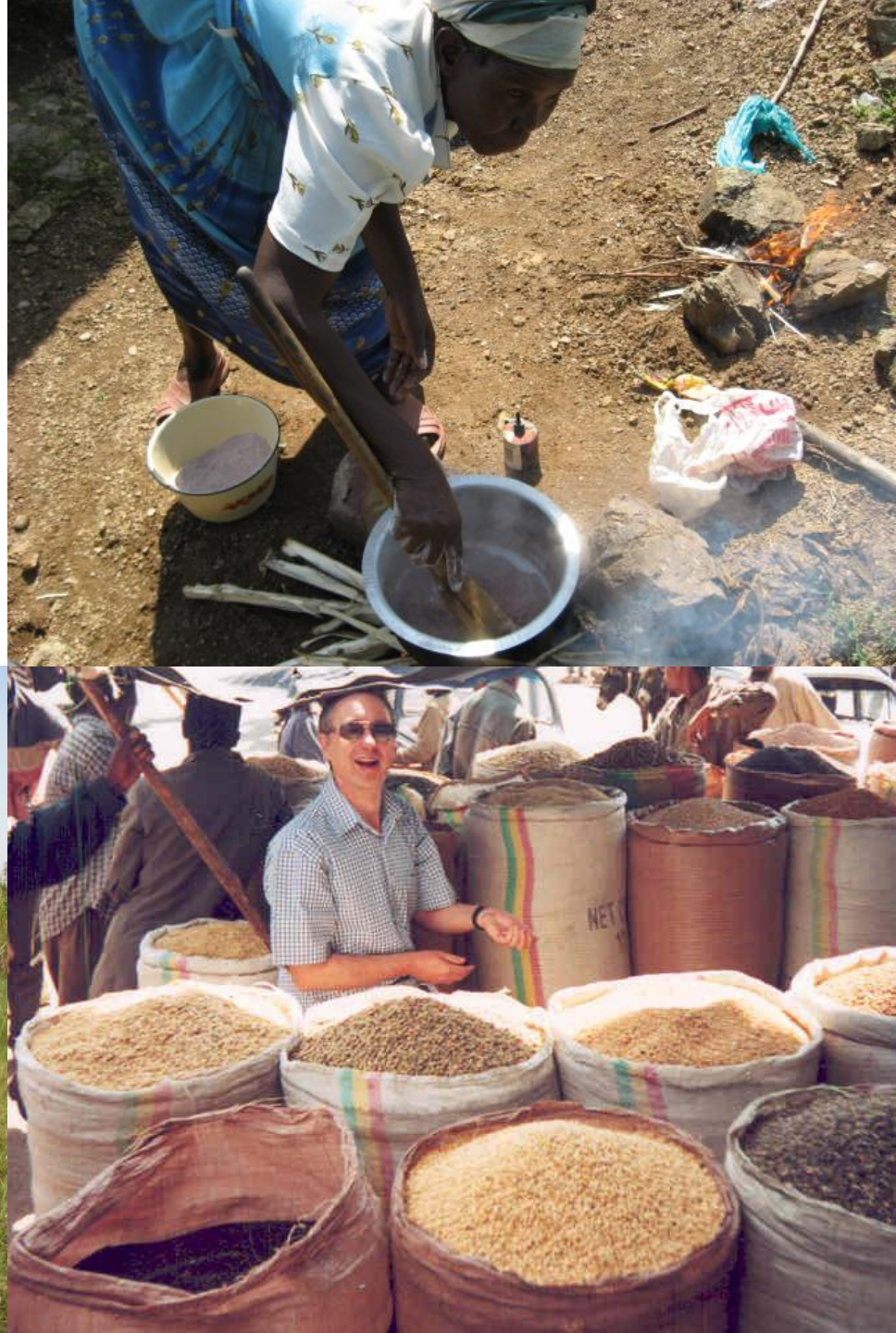


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# Traditionally

- Sorghum best known as subsistence crop
- Plays crucial role in rural food security





Changes are happening

- Rising grain prices are forcing commercial industry to look for alternative raw materials
- A need to source those raw materials close to where they are going to be used

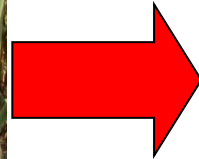
New developments in the brewing industry has enabled sorghum to be used as a raw material to brew lager beer.

**The brewing of lager beer from sorghum:  
This is one of the opportunities for subsistence  
farmers to become commercial farmers**

**Sorghum is being grown by local groups of small-  
holder farmers to provide the raw materials for  
these new lager beers. Production costs are  
reduced and the farmers are uplifted from the  
status of subsistence farmers to those who have  
an income from the sale of their produce.**

**BUT**

**Both the farmer and the processor need to be happy with the Trade**



**We need some way of ensuring that the grain the farmer is selling is of the quality he claims and the grain the processor is buying is of the quality he needs. Quality can then define the price paid.**

How do we do this?

There are existing Sorghum Grades and Standards in the region

**BUT**

They are not always appropriate for the intended use

So what do we use instead ?

# Most Appropriate Sorghum Grain Quality Criteria Identified

- High tannin/non-tannin
- Hardness
- Germinability
- Grain purity
- Grain colour

How do we measure them?

# Limitations

- Simple: not need skilled lab technician
- Should not need specialised equipment
- Chemicals must be readily available and inexpensive
- Methods should be robust and rapid



# Tannin

What you need:



Tannin Standard



Non -tannin Standard



# Tannin

## What you do:

1. Measure Caustic (5 g/100 ml bleach)



2. Add bleach, mix



3. Count out samples



4. Add bleaching reagent



5. Shake, leave for 10 min



7. Blot dry



6. Wash

# Tannin

Before bleach test

## What you get::



Tannin



White non-tannin



Red non-tannin



After bleach test



# Tannin

Before bleach test



Mixed sorghum varieties

# ODDBALL SAMPLES



Type II sorghum



After bleach test



# Tannin

Cannot malt or brew with sorghum tannin grain without pre-treatment

Tannins imparts bitter flavour to food products

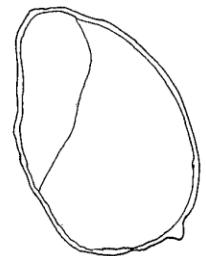
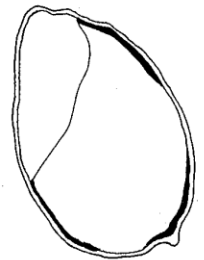
Causes:

Tannins bind to proteins (enzymes) and prevents the enzymes working.

Tannins reduce the protein quality of food products

# Grain Hardness

What you need:



Corneous

Intermediate

Floury

# Hardness

## What you do:

- Cut 20 sound, whole grains in half, longitudinally
- Compare half of each grain with the illustration shown on the previous slide



# Hardness

What you get:



**Corneous**



**Floury**



**Intermediate**

# Germinability

## What you need:



## What you do:

- Add 5 ml water to bottle lid, add newspaper circles until water is just absorbed
- Count out 100 sound kernels, place on damp newspaper, close with foil
- Place in cooler box for 48 h
- Count germinated grains after 24 and 48 h

## What you get:



Chitted grain

Unchitted grain



# Germinability

Dead grain will not germinate  
Cannot make malt from dead grain

Causes:

Old grain

Insect eaten

Moulded

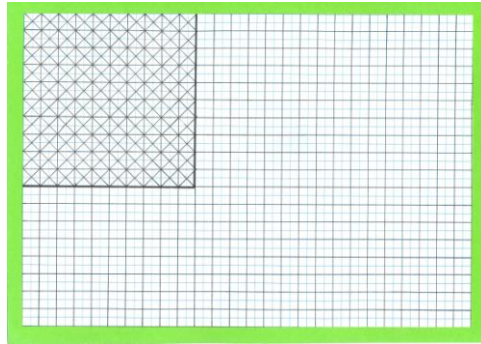
Pre-sprouted in the field

Heat damaged

# Grain purity

What you do:

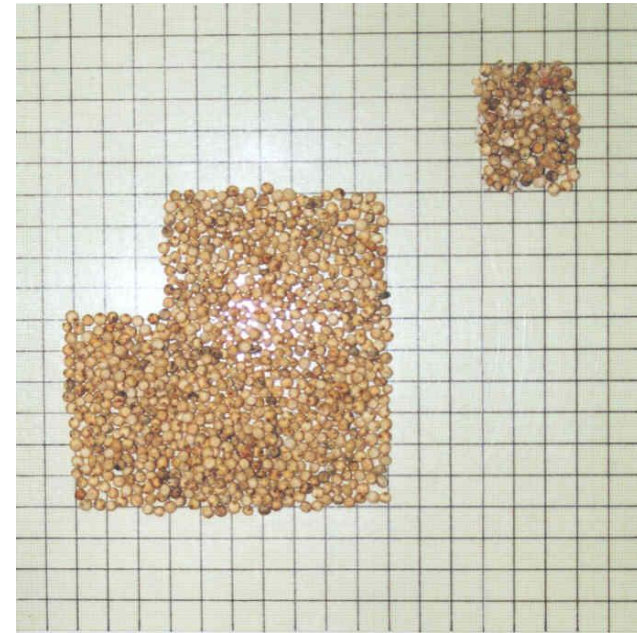
What you need:



- Measure grain into 35 mm film pot or similar
- Hand sort defects
- Use 10 x 10 cm grid and times value by 2 to calculate % defects

What you get:

% Defects = Number of squares X 2



# Actual samples grown by small-holder farmers



**Sample 1**



**Sample 2**

**Sorted sample**



**Sample 1**

**Defects**



**Defects are un-threshed grain,**

**If grain is properly threshed it would command a higher price**

## Sample 2

Sorted sample



Defects



Defects are mainly  
moulded grain.

This grain is unfit for  
consumption

# Grain Purity

No one wants to pay good money for rubbish

Causes:

Dust, stones, stalks

Broken kernels

Insect eaten grain

Foreign grain

Moulded grain

Un-threshed grain

# Colour

## What you need:

Colour standards

White paper

## What you do:

- Count out 100 sound kernels on a sheet of white paper
- Compare with colour standards

## What you get:



White colour standard



Red colour standard

5 Simple methods for sorghum grain quality can be found on [www.INTSORMIL.org](http://www.INTSORMIL.org)

Tannin, Hardness, Germinability and Grain purity have been accepted as draft ICC (International Association for Cereal Science and Technology) standard methods.

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