



THE REPUBLIC OF UGANDA

Maximise Profits: Understanding the East African Community Maize Grain Standard



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WHY STANDARDS MATTER

Following the maize grain standards reduces the risk and improves the returns of all those in the market chain:

- **Farmers** get better prices and reduce post-harvest losses. They can participate in the warehouse receipt system where they can store the maize until the price improves, and take a bank loan using their maize grain as surety.
- **Traders** get a reliable supply of high quality maize that they can sell to their clients. When the maize conforms to the standards and is available in large quantities, it is easier to sell to high value markets with less risk of the grain being rejected by the buyer.
- **Processors** want a continuous and reliable supply of quality raw materials. Complying with standards, reduces waste and ensures that the final product will be of high quality and earn a higher price.
- **Consumers** get food that is safe and nutritious to eat.

SPECIFIC REQUIREMENTS FOR MAIZE GRAIN

S/No	Characteristic	Maximum Limits		
		Grade 1	Grade 2	Grade 3
1	Moisture content, %, m/m	13.5		
2	Organoleptic	Clean and bright appearance, natural odour		
3	Other colour, %, m/m	5.0 for Yellow and Red maize 2.0 for White maize		
4	Pest damage, %, m/m	1.0	3.0	5.0
5	Rotten and diseased, %, m/m	1	2	3
6	Discoloured, %, m/m	1.5	2	2.5
7	Immature/shrivelled, %, m/m	1.0	2.0	3.0
8	Total defective, %, m/m	5	9	14
9	Broken, %, m/m	2.0	4.0	6.0
10	Filth, %, m/m	0.1	0.1	0.1
11	Inorganic matter, %, m/m	0.25	0.5	0.75
12	Foreign matter, %, m/m	0.5	1.0	1.5
13	Live insects	Nil		

Note 1: The parameter, Total defective grains is not the sum total of the individual defects. It is limited to 70% of the sum total of individual defects.

Note 2: The parameter, Discoloured grains is limited to atleast 25% discolouration on both sides of the kernel.

MYCOTOXIN LIMITS FOR MAIZE GRAIN

	Maximum Limit
Mycotoxin	All Grades
Total aflatoxins	10 µg/kg (ppb)
Aflatoxin B1	5 µg/kg (ppb)
Fumonisin	2 mg/kg(ppm)

MOISTURE CONTENT:



Moisture content is a measure of how much water is in the grain (how wet it is). It is measured with a moisture meter.

Characteristic	Maximum Limit		
	Grade 1	Grade 2	Grade 3
Moisture, % m/m	13.5		

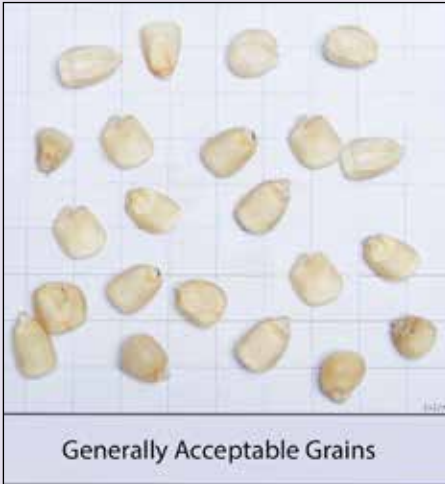
AFLATOXINS AND FUMONISINS:



Aflatoxins and Fumonisin are poisons released by certain moulds. Moulds come from soil and air and grow when grain is handled poorly. They cannot be seen by naked eye and have to be tested by a qualified personnel. Aflatoxin can cause cancer and liver damage. At high level of concentration it can cause death. Aflatoxin B1 is highly potent.

	Maximum Limit
Mycotoxin	All Grades
Total aflatoxins	10 µg/kg(ppb)
Aflatoxin B1	5 µg/kg(ppb)
Fumonisin	2 mg/kg(ppm)

ORGANOLEPTIC (APPEARANCE AND SMELL):



For all grades, maize should look clean and bright with a natural smell.



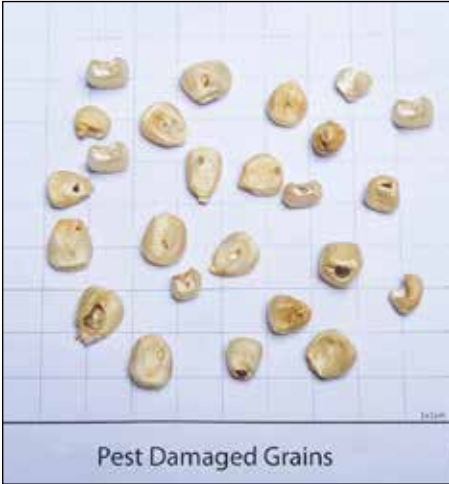
BROKEN GRAINS:



Pieces of maize which pass through a 4.5 mm diameter round hole metal sieve.

Characteristic	Maximum Limit		
	Grade 1	Grade 2	Grade 3
Broken grains, % m/m	2.0	4.0	6.0

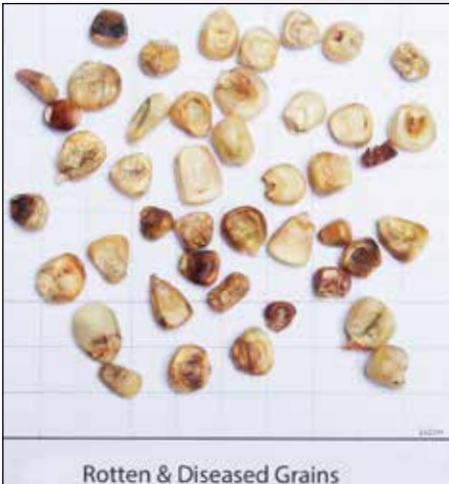
PEST DAMAGED GRAIN:



Maize grains with obvious weevil-bored holes or which have evidence of boring or tunneling, indicating the presence of insects, insect webbing or insect refuse; or degermed grains, grains chewed in one or more than one part of the grain which exhibit evident traces of an attack by vermin.

Characteristic	Maximum Limit		
	Grade 1	Grade 2	Grade 3
Pest damaged grain, % m/m	1.0	3.0	5.0

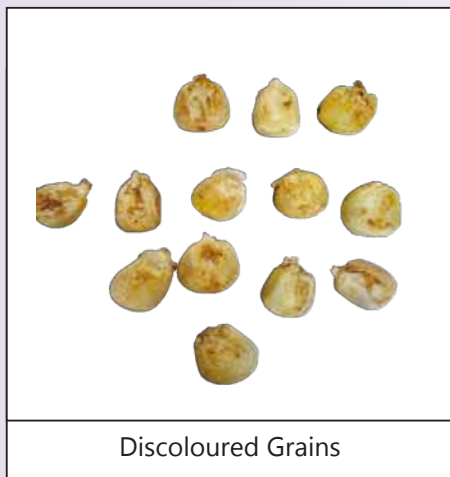
ROTTEN AND DISEASED GRAINS:



Grains made unsafe for human consumption due to decay, moulding or bacterial decomposition or other causes that may be noticed without having to cut the grains to examine them.

Characteristic	Maximum Limit		
	Grade 1	Grade 2	Grade 3
Rotten and diseased, % m/m	1	2	3

DISCOLOURED GRAINS:

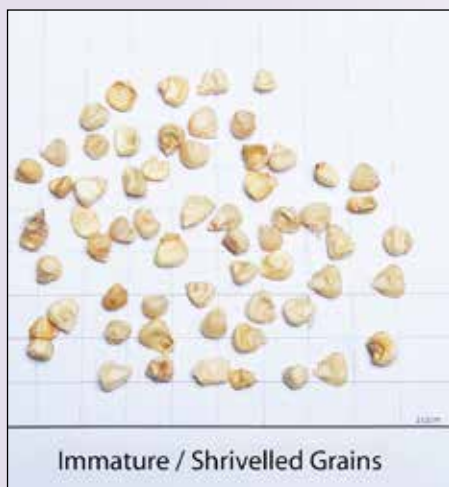


These are kernels which are damaged by heat, frost or water.

Characteristic	Maximum Limit		
	Grade 1	Grade 2	Grade 3
Discoloured grains, % m/m	1.5	2.0	2.5

Note: The discoloured grains parameter is limited to at least 25% discolouration on both side of the kernel.

IMMATURE AND SHRIVELLED GRAINS



Grains which are underdeveloped, thin and papery in appearance.

Characteristic	Maximum Limit		
	Grade 1	Grade 2	Grade 3
Immature and shrivelled grains, % m/m	1.0	2.0	3.0

STAINED GRAIN:

Stained grain



Grain or kernel whose natural colour has been altered by external factors, such as ground, soil or weather. This may include grain which has dark stains or discolouration with a rough external appearance.

Characteristic	Maximum Limit		
	Grade 1	Grade 2	Grade 3
Stained grain, % m/m	No limit by itself. But limited to total defective.		

TOTAL DEFECTIVES:

The total defectives are all pest-damaged, discoloured, diseased, germinated, mouldy, immature and shrivelled, rotten and diseased, stained and broken grains.

Characteristic	Maximum Limit		
	Grade 1	Grade 2	Grade 3
Total defectives, % m/m	5	9	14

Total Defectives = 70% x (%Pest-Damaged + %Discoloured + %Rotten and Diseased + %Immature and Shrivelled + %Stained + %Broken)

ORGANIC MATTER:



This is any animal or plant matter (seed coats, straws, weeds and wood) other than grain of maize, damaged maize grain, other grains, inorganic matter and harmful/toxic seeds.

Characteristic	Maximum Limit		
	Grade 1	Grade 2	Grade 3
Organic matter, % m/m	No limit by itself. But limited in terms of total foreign matter.		

INORGANIC MATTER:



Stones, metal, sand, soil, glass and other mineral matter.

Characteristic	Maximum Limit		
	Grade 1	Grade 2	Grade 3
Inorganic matter, % m/m	0.25	0.5	0.75

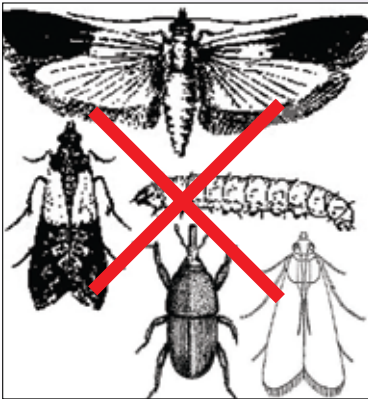
FOREIGN MATTER:

This is all organic and inorganic material (such as leaves, bits of maize cobs, wood, sand, soil and glass) other than maize, broken kernels, other grains.

Characteristic	Maximum Limit		
	Grade 1	Grade 2	Grade 3
Foreign matter, % m/m	0.5	1.0	1.5

Foreign matter = Inorganic matter + Organic matter.

LIVE PESTS:



For all grades, no live insects of any kind are acceptable.

Characteristic	Maximum Limit		
	Grade 1	Grade 2	Grade 3
Live insects	Nil		

FILTH:



Filth are impurities of animal origin, for example; animal bone fragments, bird excrement and rat droppings.

Characteristic	Maximum Limit		
	Grade 1	Grade 2	Grade 3
Filth, % m/m	0.1		

PACKAGING - MAXIMUM 50 KILOGRAM BAGS/PACKAGE

- Maize grains shall be packed in suitable food grade packages which shall be clean, not torn, and free from insects or fungal infestation.
- Maize grains shall be packed in containers which will safeguard the hygiene, nutritional, appearance and smell of the products.
- Each package shall contain maize grains of the same type and of the same grade designation.
- If maize grains are packed in bags, the bags shall be free of pests and contaminants.
- Each package shall be securely closed and sealed.

Each package shall be legibly and indelibly labelled with the following:

i) product name (white / red / yellow or mixed) ii) grade; iii) name, address and physical location of the producer / packer / importer; iv) lot / batch / code number; v) net weight, in kilograms; vi) “Food for Human Consumption”; vii) “Store in a cool, dry place away from any contaminants”; viii) crop year; ix) packing date; x) instructions on disposal of used package; xi) country of origin; and xii) a declaration on whether the maize was genetically modified, where applicable.

EAC Partner States are signatories to the International Labour Organization’s requirement for maximum package weight of 50 kg where human loading and offloading is involved.

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- National Agricultural Research Organisation
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- Uganda National Commodity Exchange
- Uganda National Bureau of Standards
- Uganda National Chamber of Commerce and Industry
- Uganda National Farmers Federation
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- USAID Feed the Future Uganda Enabling Environment for Agriculture Activity
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For further information contact;

Uganda National Bureau of Standards

P.O. Box 6329 Kampala

info@unbs.go.ug; www.unbs.go.ug

Standards House, Bweyogerere

Plot 2 - 12 By pass Link

Bweyogerere Industrial and Business Park

Tel: 0414 333 250, Toll Free Helpline: 0800 133 133