GTA

Visual Recognition Standards Guide

FOR GRAIN COMMODITY SAMPLING & ASSESSMENT

Issued 1st August 2023

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Grain Trade Australia (GTA)

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SORGHUM

WHEAT

INTRODUCTION

Defective Grains

This guide is produced to assist samplers and assessors of grain in the determination of defective grains which are covered by the Grain Trade Australia (GTA), Australian Oilseeds Federation (AOF), and Pulse Australia Standards.

All images in this guide (unless otherwise identified) are defective. These photographs depict the minimum standard for a grain to be assessed as defective. If a grain defect does not meet the physical attributes depicted in the photograph, it is to be assessed as sound. Unless otherwise stated, the grain defect may only appear on one side. That is, the photographs depict the minimum to be assessed as defective, and only needs to be present on one side (unless otherwise stated).

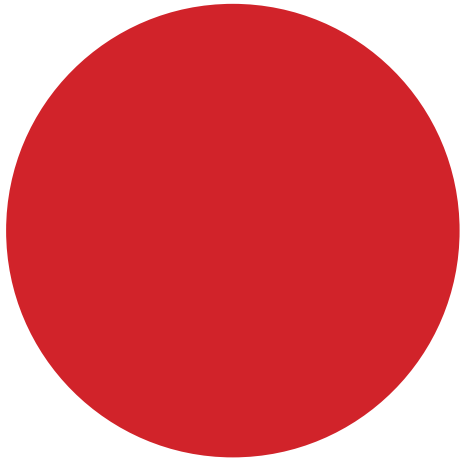
Pictures shown at this size are an approximate size of the original grain only.
These pictures are enlarged to assist in illustration of the defect.

Calibration

A calibration sheet is provided for those who are downloading and printing these guides. Careful calibration of these photographs is vital as monitors and printers may vary.

DOCUMENT CALIBRATION

Issued: 1st August 2023



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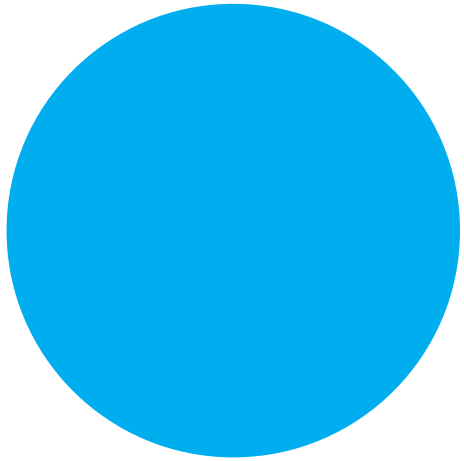
Minolta Value:
L= 48.59 a= +51.21 b= +31.27



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Minolta Value:
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Minolta Value:
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NOTE: The hardware (monitor, graphics card, etc.) used to display the images in Inspector Standardisation content influences the appearance of the images. As a result the images may have a slightly different appearance when viewed on different makes/models of computer and display. These images were created using a Dino-Lite Edge 5MP AM7915, calibrated LCD display with 1680x1050, 32 Bit, 60 Hz resolution and the following calibration settings:

Brightness: 0 Contrast: 50 Gamma: 1.0 Hue: 0 Saturation: 0

The VRSG should be viewed using a computer with digital video (DVI) output and an EIZO CG19, EIZO S1921, EIZO S1932, EIZO S1961, or EIZO CE210W display.

Paper Type for Printing: Brand: Office Elements GSM: 80gsm Colour: White

Laminate material: Brand: OfficeMax 125 Micron laminating pouches Re-Order Code: 1950630

Disclaimer: The mention of firm names or trade products does not imply that they are endorsed or recommended.

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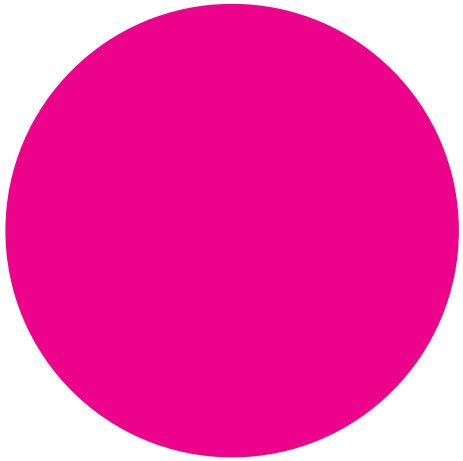
PRINTER CALIBRATION



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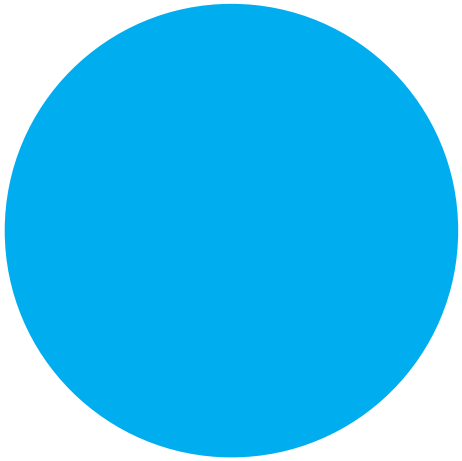

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CMYK Value:
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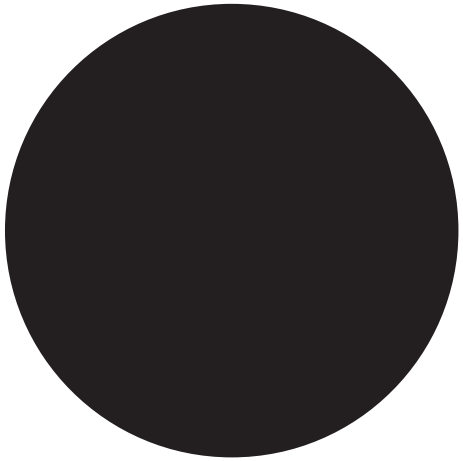

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NOTE: This page is specifically for use by a commercial printer.

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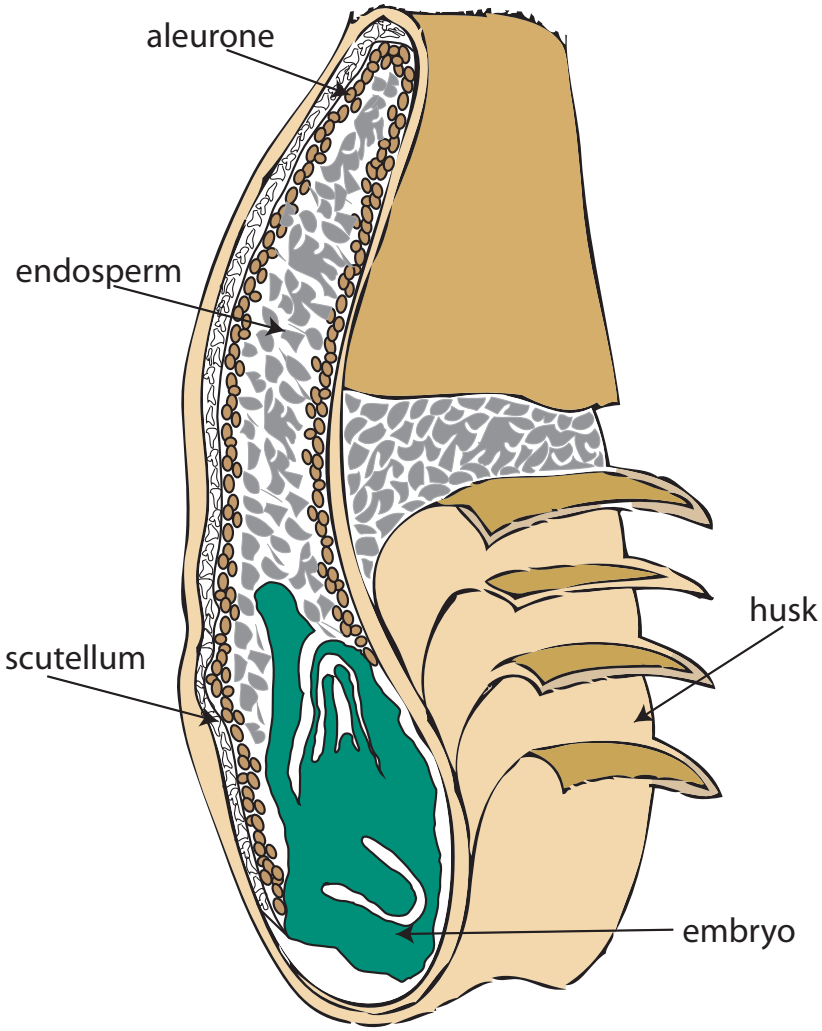
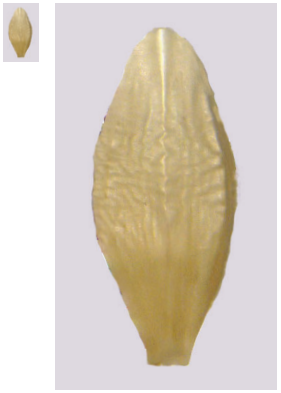
Laminate material: Brand: OfficeMax 125 Micron laminating pouches Re-Order Code: 1950630

Disclaimer: The mention of firm names or trade products does not imply that they are endorsed or recommended.

BARLEY



Barley Grain



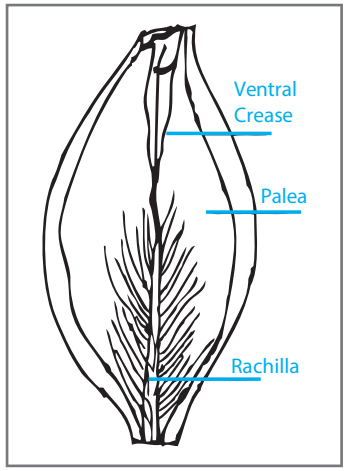
Sound

BARLEY: VARIETAL IDENTIFICATION

Issued: 1st August 2023

Definition: The main characteristic used in identifying barley varieties is the length of the hairs on the Rachilla. The Rachilla is white in colour and found running along the grain furrow from the germ end. There are two main types of Rachilla hair length, long hairs and short woolly hairs.

Long

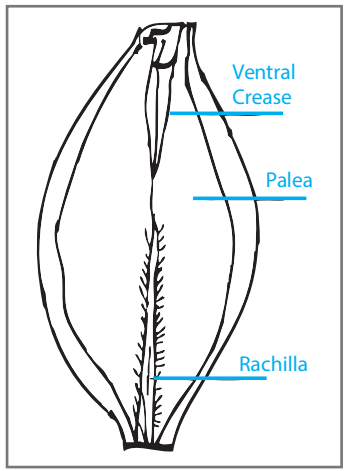


Long

Common Varieties include:

Banks
Bass
Baudin
Beast (AGT)
Bottler
Compass
Fairview
Fathom
Grout
Kiwi
Leabrook
Maximus CL
Oxford
Rosalind
Scope (Cl.)
Shepherd

Short



Short

Common Varieties include:

Buff
Commander
Fleet Australia
Flinders
Gairdner
GrangeR
Hindmarsh
La Trobe
Laperouse
LG Alestar
(RGT) Planet
Schooner
Spartacus (Cl.)
Urambie
Westminster

Awn End of Grain

Dorsal (Back)

Ventral (Front)

Germ End of Grain

BARLEY: COMMON DEFECTS

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Sprouted

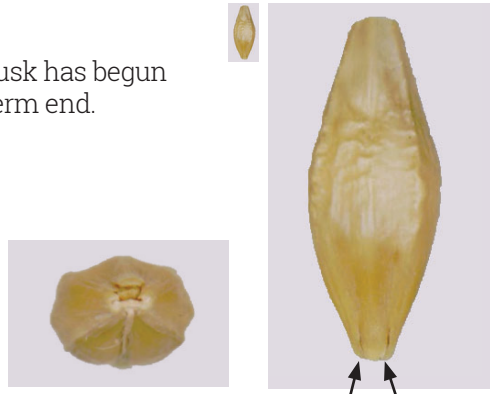
Definition: Sprouted grains are those with any visible evidence of the shoot or root system beginning to emerge from the germ.

Side

Shot

Definition: Grains exhibiting the following outward signs of having commenced germination are classified as Shot:

- Opening of the grain at the germ end and/or
- The husk has 'tramlines' on both sides where the husk has begun to lift on each side on the back of the grain at the germ end.



"tramlines"

Dark Tipped (Germ End Stained-WA)

Definition: Grains exhibit a distinct brown to black discolouration. This mainly occurs at the germ end of the grain, however in severe cases it may progress to other parts of the grain. Discolouration originating at the awn end is not Dark Tipped, refer to Severely Damaged. Dark tipping equal to or greater than 1mm is classified as defective grain.

Note: image represents the minimal level of intensity of colour and 1mm length.

Sound

Defective

BARLEY: COMMON DEFECTS

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Skinnings (Skinned-WA)

Definition: Damage to the protective husk of the barley. Usually caused by mechanical damage to the grain during harvesting.

Each grain exhibiting one or more of the following characteristics is assessed as a skinned grain -

- Skinning - 1/3 or more of the total surface area of the husk is missing.
- Germ Exposed - The husk is removed from the germ end of the grain or been damaged other than Shot or Sprouted or the germ itself has been removed.
- Kernels may or may not be dark under the husk.

Dorsal (Back) | Ventral (Front) | Germ Exposed | Dark Under Husk

Cleaved (front, back and side)

Definition: Refers to any damage to the grain exposing the white endosperm. Any visible cleaving is considered defective. It includes but is not limited to -

- A split along the crease or a split down the back, front or side of the grain exposing the white endosperm.
- Grains that are swollen but smaller in size than normal, are sometimes fused in groups of 2 or 3 and are split to reveal the inner endosperm (sometimes identified as hormonal damage).
- Kernels may or may not have a pink discolouration.

Ventral (Front) | Ventral (Front) | Dorsal (Back) | Side | Hormonal Damage

BARLEY: COMMON DEFECTS

Issued: 1st August 2023

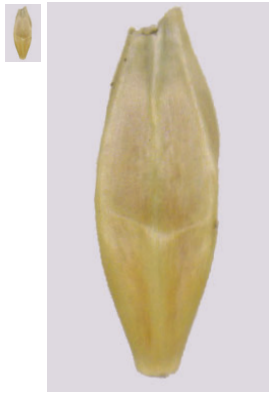
Distorted

Definition: Grain which is collapsed on the dorsal side. Grains may also appear orange in colour.

Sound

Sound

Side



Dorsal

Orange Under Husk

Orange Kernel

Side

Dry Green or Sappy

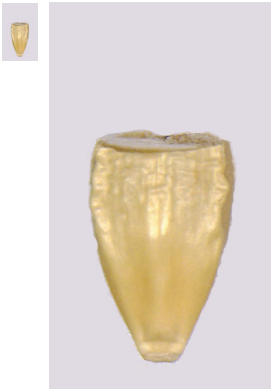
Definition Dry Green: Grain surface is distinctly green. Grains are usually dry and hard.

Definition Sappy: Grains are generally soft when pressed. They may or may not be green. Any level of sappiness is classified as defective.

Dry Green

Broken

Definition: Grain that has 1/3 or more missing from the Kernel.



Broken

BARLEY: COMMON DEFECTS

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Heavily Discoloured-WA

Definition: Staining is dark in appearance. Usually affects more than the germ end.

Pink Fungal Staining

Definition: Orange, pink to red discolouration found anywhere on the surface. Grains appear healthy otherwise.

Field Fungi (Spotted/Field Fungi Affected-WA)

Definition: Refers to individual kernels -

- Seed coat has the appearance of black spotting occurring anywhere on the grain. Coverage greater than approximately 10% of the grain surface is considered defective, otherwise classified as sound.
- Grey or brown surface discolouration on the kernel and/or husk.

Black Spotting

Black Spotting

Grey Discolouration

Discolouration on Kernel

BARLEY: COMMON DEFECTS

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Severely Damaged inc. Fusarium (except WA)

Definition: Damage to the grain causing it to become severely discoloured. A grain exhibits one or more of the following characteristics -

Burnt / Heat Damaged:

Heat Damaged or Burnt refers to those kernels that have become discoloured. Affected grains appear dark brown, or in severe cases, blackened. May also appear discoloured under the husk on the kernel.

Mould:

Affected grains appear discoloured and visibly affected by mould.

Diseased / Other Serious Visual Defects:

Refers to those kernels that have become significantly discoloured and/or have a serious visual defect that is not otherwise listed in these Standards. It includes grains affected by Fusarium (except WA).

Does not include Field Fungi affected grains, refer to Field Fungi.

Sound

Sound Awn

Heat Damaged (Blackened)

Heat Damaged

Mould

Damage Under Husk

BARLEY: CONTAMINANTS/DEFECTS

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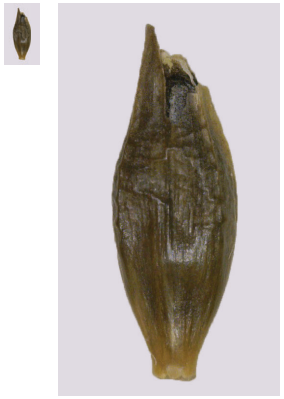
Coloured Aleurone Layer (Blue or Black)

Definition: Grains which have a coloured aleurone layer in the kernel. The colour is generally blue or black.

It includes any blue or black colour to any degree that is obvious under the bran layer.

Also includes black hulled varieties.

Blue Aleurone Layer



Black Hulled

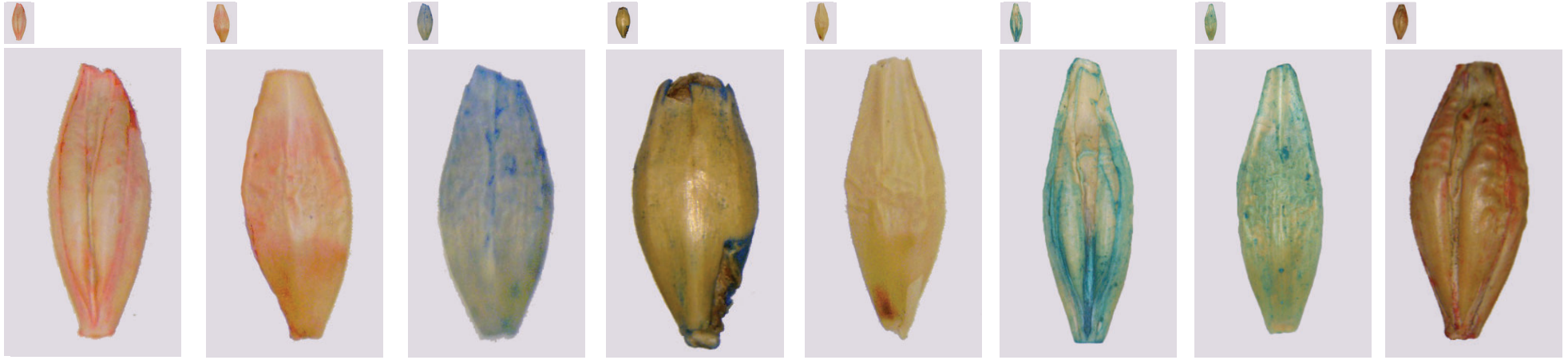
Insect Damaged

Definition: Any visible insect damage penetrating through to the white endosperm.

Pickling Compounds or Artificial Colour (Pickled Barley-WA)

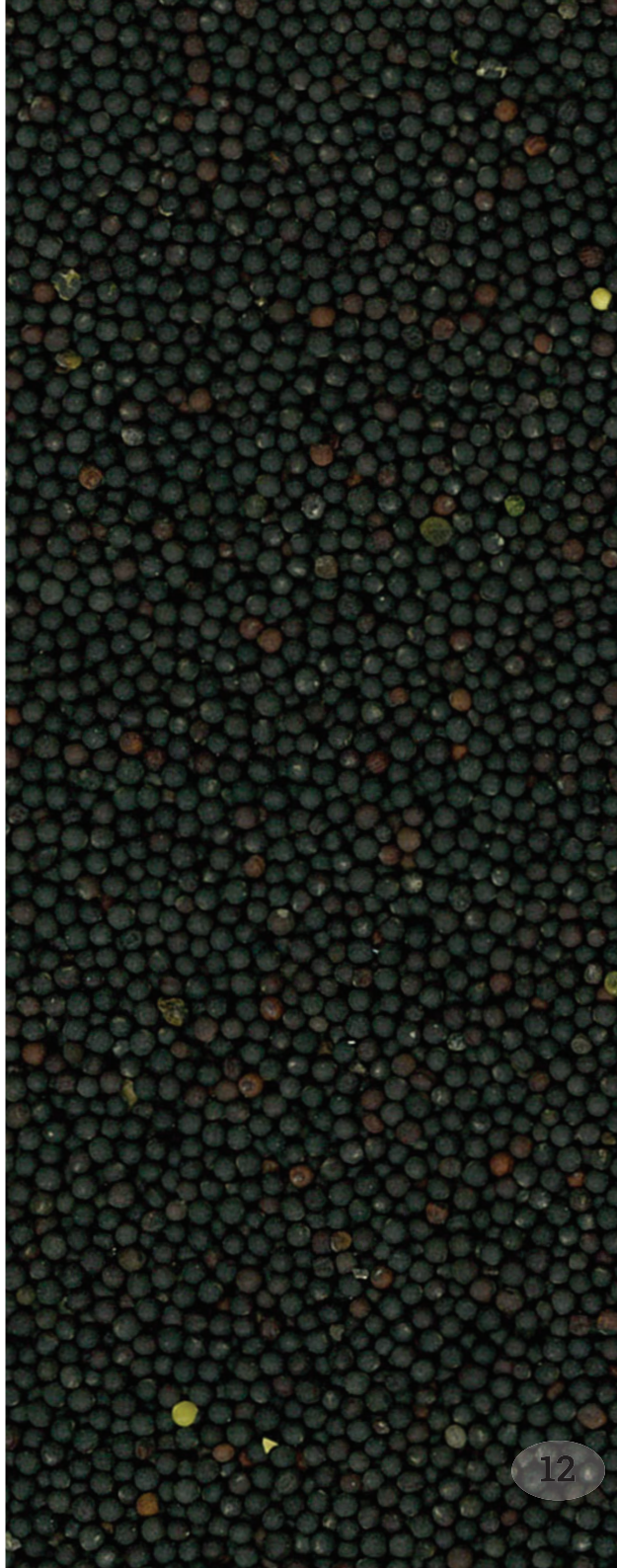
Definition: An unnatural surface colour and/or colour that rubs off. Any grains that are artificially coloured, regardless of intensity, are defective.

Note: These photographs are to illustrate artificial colours and appearance only. A **nil tolerance** applies to any pickling compounds/contaminants, regardless of intensity or coverage or colour.



CANOLA

Sound

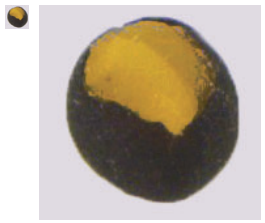


CANOLA: COMMON DEFECTS

Issued: 1st August 2023

Broken or Split

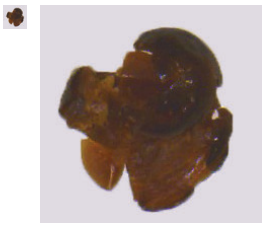
Definition: All hulls, kernels or parts thereof, not otherwise damaged shall be classified as split or broken seed (except fines classified as Impurities). Any level of damage is classified as defective. This includes Insect Damaged.



Heat Damaged

Definition: Seeds and pieces of seed that are materially discoloured and damaged by heat. Seeds may have a heated odour or a brown powdery appearance when crushed.

Sound Crushed



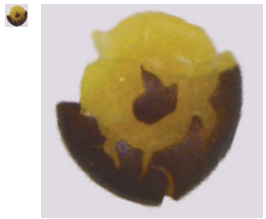
Defective Crushed

Sprouted

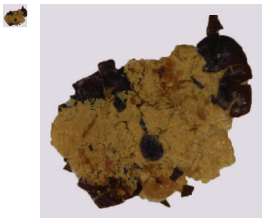
Definition: The seed coat has split and the primary root has emerged. This includes early and any further advanced stage of growth of the primary root. Includes grains where the primary root has been knocked off during the harvesting or handling process.

Weather Damaged

Definition: Weather damaged seeds are classified under Damaged Seeds. Weather damaged seeds are those that have been subjected to rain during the matuation phase to the extent they have become Weather Damaged. When seeds are crushed, they may have a grey washed out appearance and a chalky texture.



Sound Crushed



Defective Crushed

CANOLA: COMMON DEFECTS

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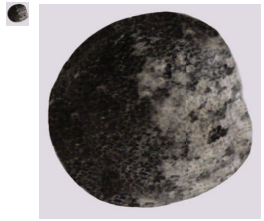
Mould

Definition: Seeds may appear discoloured, rotten, swollen and soft, feel spongy under pressure, show the presence of fungal spores or visibly affected by mould on the seed coat. Includes Field Fungi seeds.



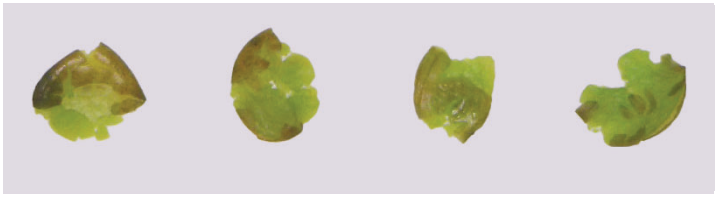
Frost Damaged

Definition: Frost damaged seeds are included in Impurities. Frost damaged seeds are included in admixture (WA).

Green Seeds

Definition: Green seeds are those that are distinctly green when crushed. Seeds that are yellow-green are not considered green.

Sound Crushed
Yellow or Yellow-Green when crushed



Defective Crushed
Green Seed – distinctly green when crushed

CHICKPEAS, DESI

Sound

CHICKPEAS, DESI: COMMON DEFECTS

Issued: 1st August 2023

Severely Damaged

Definition: Damage to the grain causing it to become severely discoloured. A grain exhibits one or more of the following characteristics -

Burnt / Heat Damaged:
Heat Damaged or Burnt refers to those grains that have become severely discoloured. Affected grains appear dark brown, or in severe cases, blackened.

Mould:
Affected grains appear discoloured and visibly affected by mould.

Diseased / Other Serious Visual Defects:
Refers to those grains that have become significantly discoloured and/or have a serious visual defect that is not otherwise listed in these Standards.

Sound - Refer Stained and Weather Damaged.

Heat Damaged

Mould

Mould

CHICKPEAS, DESI: COMMON DEFECTS

Issued: 1st August 2023

Broken, Chipped, Loose Seed Coat and Split

Definition: Breakage, cracking, peeling or splitting of the seed coat or chipping and splitting of the kernel in various forms as follows -

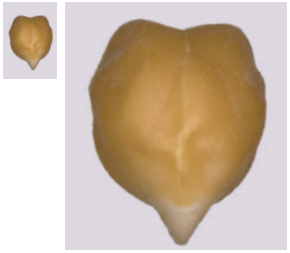
Seed Coat:

- Split Seed Coat - A split in the seed coat running more than half the entire length or across the entire width on one or both sides.
- Skin Damaged - A hole in the seed coat where more than 20% of the seed coat on any one side is missing.
- Loose Seed Coat (Peeling) - Where the seed coat is visibly falling off the kernel to any extent and not adhering tightly to the kernel.
- Missing Seed Coat - Where the entire seed coat is missing but the kernel remains intact.

Split Seed coat

Skin Damaged

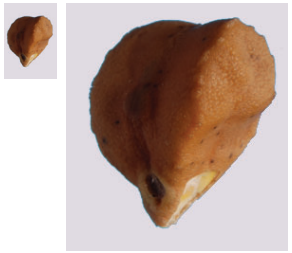
Loose Seed Coat (Peeling)



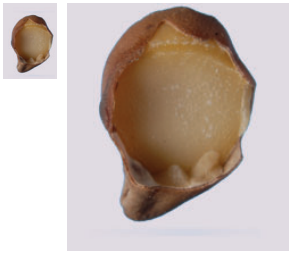
Missing Seed coat

Kernel:

- Chipped (Scratched) – A part of the kernel is damaged or removed.
- Broken - A split kernel with the seed coat still attached.
- Split – A split kernel with no seed coat attached.



Chipped (Scratched)



Broken

Split

CHICKPEAS, DESI: COMMON DEFECTS

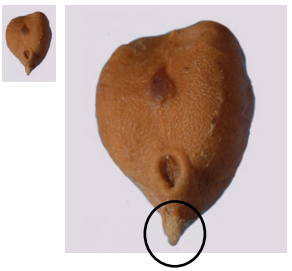
Issued: 1st August 2023

Insect Damaged

Definition: Any visible insect damage to the grain is to be classified as defective.

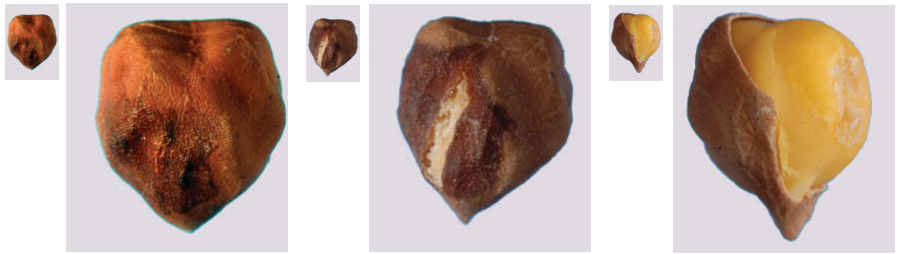
Sprouted

Definition: The seed coat has split and the primary root has emerged. This includes early and any further advanced stage of growth of the primary root. Includes grains where the primary root has been knocked off.



Hail Damaged

Definition: Any damage to the seed coat or kernel is classified as defective. Damage to the seed coat can appear as bruising (darkening) or in more severe cases splitting of the seed coat. This may cause discolouration and damage to the kernel. Damage to the kernel can vary from bruising (darkening) to physical damage such as crushing of the entire kernel.



CHICKPEAS, DESI: COMMON DEFECTS

Issued: 1st August 2023

Shrivelled and Wrinkled

Definition: Visible damage to the seed coat or size and shape of grain whereby the grains are severely distorted and/or shrunken. Seed coats may show a level of discolouration depending on the extent of damage. Grains are often smaller than the majority in the sample.

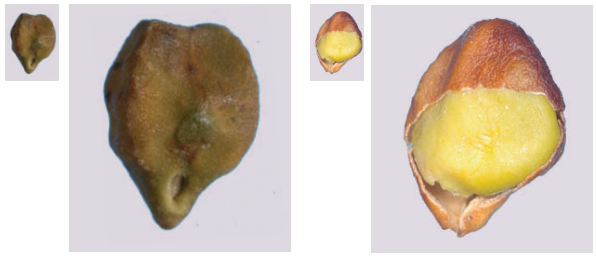
Green

Definition: Green is included in Poor Colour.

Seed Coat:
Seed coat appears green. More than a slight greenish tinge must be present on the seed coat to be classified as defective.

Where any greenish tinge is present on the seed coat, it is recommended the kernel also be inspected.

Kernel:
Any level of green is classified as defective.

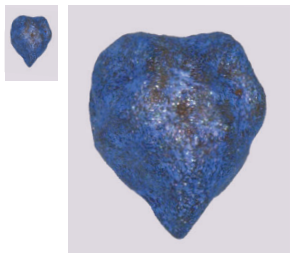


Green Kernel

Pickling Compounds or Artificial Colour

Definition: An unnatural surface colour and/or colour that rubs off. Any grains that are artificially coloured, regardless of intensity, are defective.

Note: These photographs are to illustrate artificial colours and appearance only. A **nil tolerance** applies to any pickling compounds/contaminants, regardless of intensity or coverage or colour.



CHICKPEAS, DESI: COMMON DEFECTS

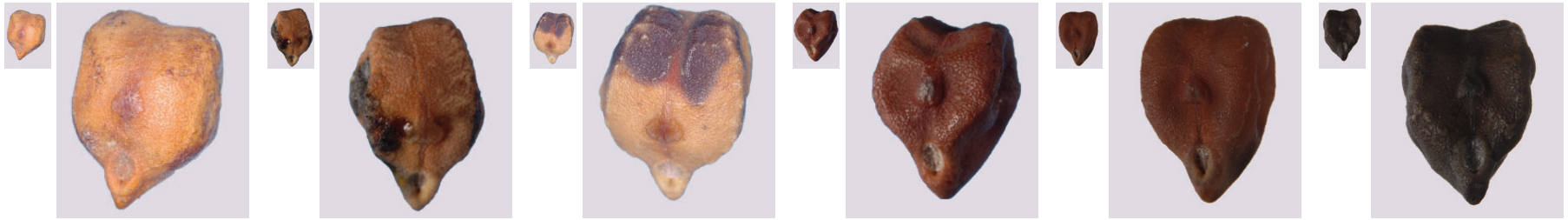
Issued: 1st August 2023

Poor Colour

Definition: Green is included in Poor Colour. Stained and Weather Damaged is included in Poor Colour. Fungal Affected is included in Poor Colour.

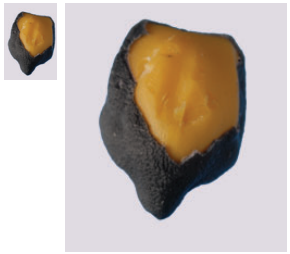
Seed Coat:
Seed coats vary from dark brown to black, but may be depicted by other colours. Seed coats may be similar in appearance to various other defects such as Severely Damaged.

Where any poor colour is present on the seed coat, it is recommended the kernel also be inspected.
Poor Colour kernel can only be assessed if the seed coat is removed.

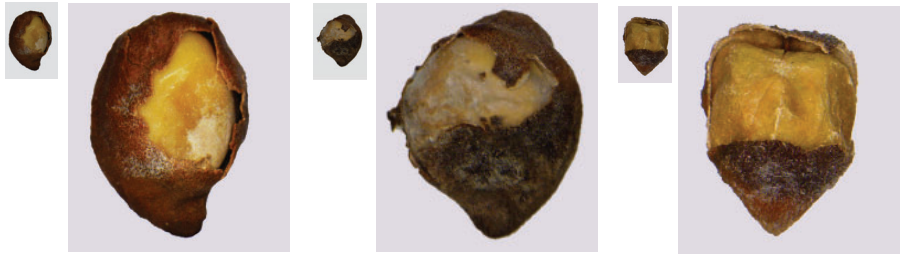


Defective

Kernel:
Any level of discolouration on the kernel is classified as defective.



Not Poor Colour Kernel. Refer Poor Colour Seed Coat.



Defective Kernel, therefore this is classified as Poor Colour.

CHICKPEAS, DESI: COMMON DEFECTS

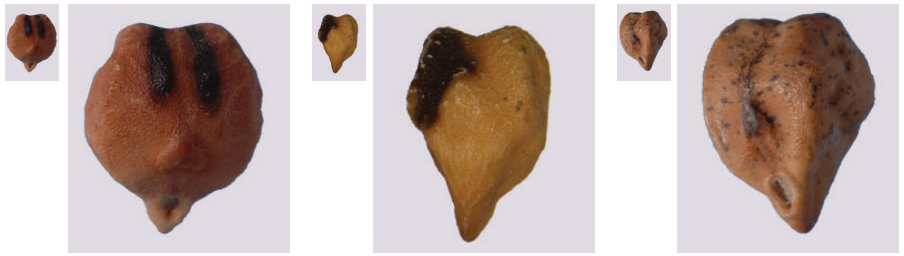
Issued: 1st August 2023

Stained and Weather Damaged

Definition: Stained and Weather Damaged is included in Poor Colour.

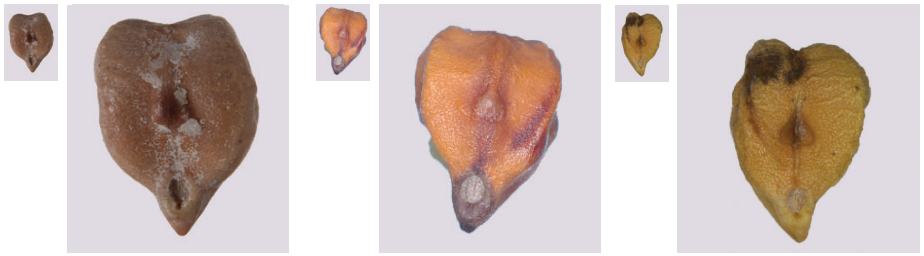
A general term used to describe visible damage to the seed coat that may or may not otherwise be defined or be distinguishable from other defects in the Standards. Seed coats may be discoloured or altered in size or shape. Weather Damage may also lead to a Loose Seed Coat or Shrivelled and Wrinkled.

Any degree of Tiger Striping or Speckled is not considered Poor Colour, but is considered sound. Tiger Striping or Speckling on the kernel is to be classified as Poor Colour Kernel.



Tiger Striping | Tiger Striping | Speckled

Sound

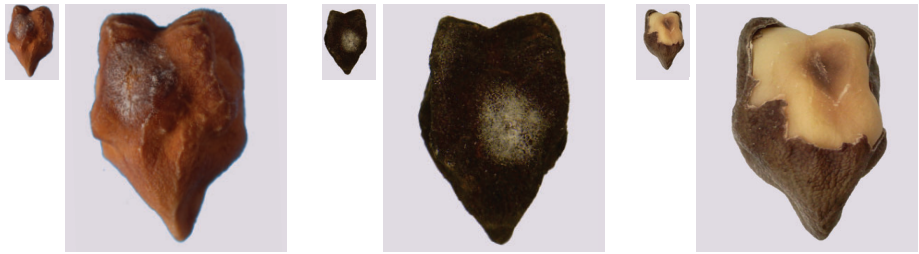


Defective

Fungal Affected (e.g. Ascochyta)

Definition: Fungal Affected is included in Poor Colour.
Lesions are generally visible to the naked eye and appear intense dark brown to black. The lesion may be similar in colour to Severely Damaged or Stained and Weather Damaged.

Any lesion of any size is permitted provided it is not also present on the kernel. If the lesion is greater than approximately 20%, but does not penetrate to the kernel the grain is classified as Stained and Weather Damaged.



Ascochyta lesion | **Ascochyta lesion** | **Ascochyta lesion on kernel**

CHICKPEAS, KABULI

Sound

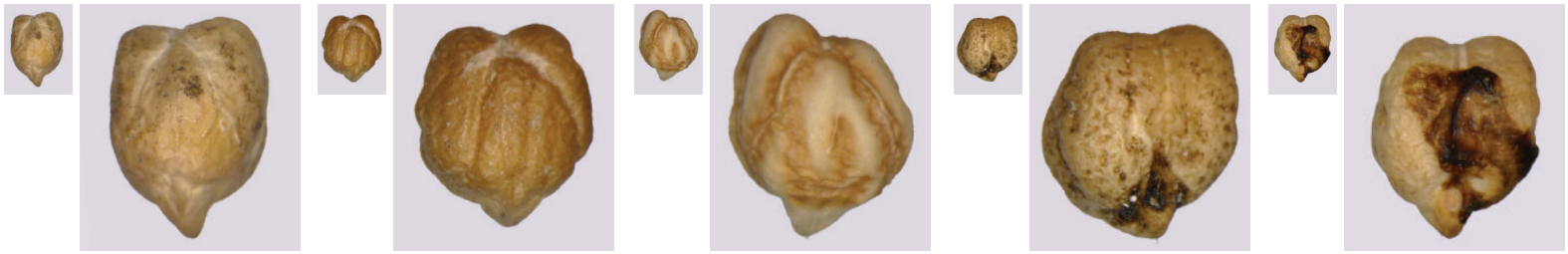
CHICKPEAS, KABULI: COMMON DEFECTS

Issued: 1st August 2023

Poor Colour

Definition: Seed coats vary from dark brown to black, but may be depicted by other colours. Seed coats may be similar in appearance to various other defects such as Severely Damaged.

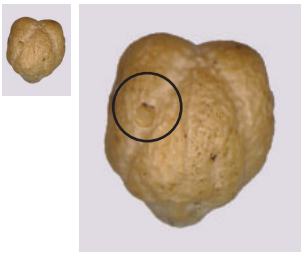
Where any poor colour is present on the seed coat, it is recommended the kernel also be inspected.



Defective

Insect Damaged

Definition: Any visible insect damage to the grain is to be classified as defective.



CHICKPEAS, KABULI: COMMON DEFECTS

Issued: 1st August 2023

Broken, Chipped, Loose Seed Coat and Split

Definition: Breakage, cracking, peeling or splitting of the seed coat or chipping and splitting of the kernel in various forms as follows -

Seed Coat:

- Split Seed Coat - A split in the seed coat running more than half the entire length or across the entire width on one or both sides.
- Skin Damaged - A hole in the seed coat where more than 20% of the seed coat on any one side is missing.
- Loose Seed Coat (Peeling) - Where the seed coat is visibly falling off the kernel to any extent and not adhering tightly to the kernel.
- Missing Seed Coat - Where the entire seed coat is missing but the kernel remains intact.

Split Seed coat

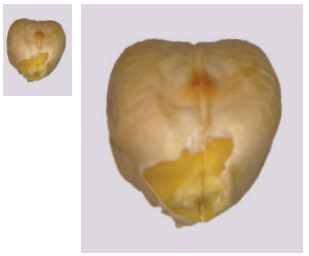
Skin Damaged

Loose Seed Coat (Peeling)

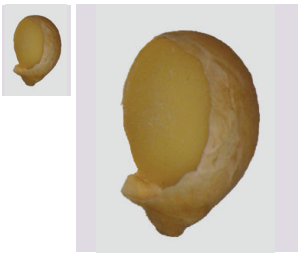
Missing Seed coat

Kernel:

- Chipped (Scratched) – A part of the kernel is damaged or removed.
- Broken - A split kernel with the seed coat still attached.
- Split – A split kernel with no seed coat attached



Chipped (Scratched)



Broken

Split

CHICKPEAS, KABULI: COMMON DEFECTS

Issued: 1st August 2023

Severely Damaged

Definition: Damage to the grain causing it to become severely discoloured. A grain exhibits one or more of the following characteristics:

Burnt / Heat Damaged:

Heat Damaged or Burnt refers to those grains that have become severely discoloured. Affected grains appear dark brown, or in severe cases, blackened.

Mould:

Affected grains appear discoloured and visibly affected by mould.

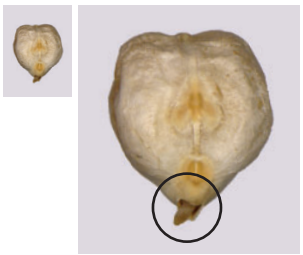
Diseased / Other Serious Visual Defects:

Refers to those grains that have become significantly discoloured and/or have a serious visual defect that is not otherwise listed in these Standards.

Mould **Mould**

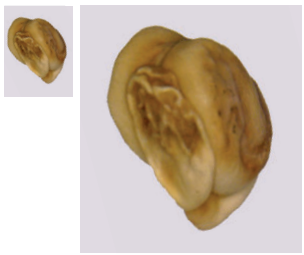
Sprouted

Definition: The seed coat has split and the primary root has emerged. This includes early and any further advanced stage of growth of the primary root. Includes grains where the primary root has been knocked off.



Shrivelled and Wrinkled

Definition: Visible damage to the seed coat or size and shape of grain whereby the grains are severely distorted and/or shrunken. Seed coats may show a level of discolouration depending on the extent of damage. Grains are often smaller than the majority in the sample.



Defective

FABA BEANS

***Where applicable, Broad Beans should be assessed using Faba Bean visual images.*

Sound

FABA BEANS: COMMON DEFECTS

Issued: 1st August 2023

Severely Damaged

Definition: Damage to the grain causing it to become severely discoloured. A grain exhibits one or more of the following characteristics -

Burnt / Heat Damaged:

Heat Damaged or Burnt refers to those grains that have become severely discoloured. Affected grains appear dark brown, or in severe cases, blackened.

Mould:

Affected grains appear discoloured and visibly affected by mould.

Diseased / Other Serious Visual Defects:

Refers to those grains that have become significantly discoloured and/or have a serious visual defect that is not otherwise listed in these Standards.

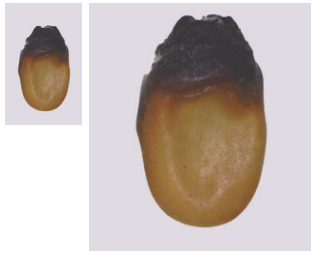
Pod Fluff Sound

Burnt

Heat Damaged

Heat Damaged

Other Serious Visual Defect



Mould

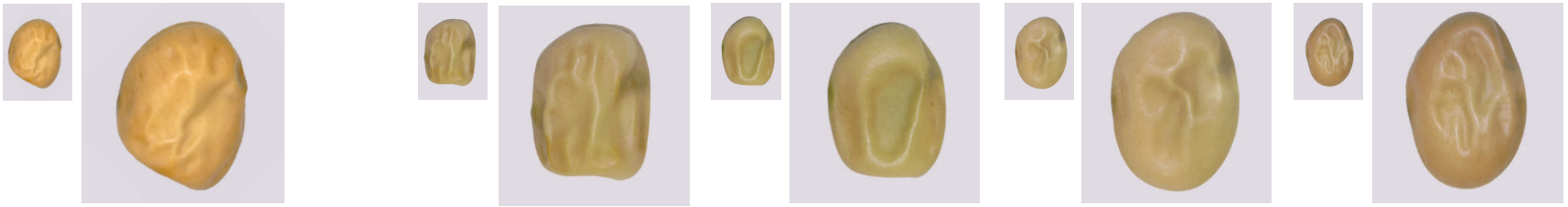
Mould

FABA BEANS: COMMON DEFECTS

Issued: 1st August 2023

Shrivelled and Wrinkled

Definition: Visible damage to the seed coat or size and shape of grain whereby the grains are severely distorted and/or shrunken. Seed coats may show a level of discolouration depending on the extent of damage. Grains are often smaller than the majority in the sample.

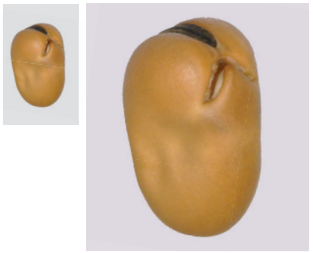


Sound — **Defective**

Sprouted

Definition: Seed coat has split and the primary root has emerged. This includes early and any further advanced stage of growth of the primary root. Includes grains where the primary root has been knocked off.

Where the seed coat has split but the primary root has not emerged, the grain is to be classified under Broken, Chipped, Loose Seed Coat and Split.



Sound

Defective

Insect Damaged

Definition: Any visible insect damage to the grain is to be classified as defective.

FABA BEANS: COMMON DEFECTS

Broken, Chipped, Loose Seed Coat and Split

Definition: Breakage, cracking, peeling or splitting of the seed coat or chipping and splitting of the kernel in various forms as follows -

Seed Coat:

- Split Seed Coat - A split in the seed coat running more than half the entire length or across the entire width on one or both sides. Split may or may not be tightly adhering to the kernel.
- Skin Damaged - A hole in the seed coat where more than 20% of the seed coat on any one side is missing.
- Loose Seed Coat (Peeling) - Where the seed coat is visibly falling off the kernel to any extent and not adhering tightly to the kernel.
- Missing Seed Coat - Where the entire seed coat is missing but the kernel remains intact.

Split Seed Coat

Skin Damaged

Loose Seed Coat (Peeling)

Missing Seed coat

Kernel:

- Chipped (Scratched) – A part of the kernel is damaged or removed.
- Broken - A split kernel with the seed coat still attached.
- Split – A split kernel with no seed coat attached.

Chipped (Scratched)

Broken

Split

Issued: 1st August 2023

FABA BEANS: COMMON DEFECTS

Poor Colour

Definition: Green is included in Poor Colour. Fungal Affected is included in Poor Colour. Frost Damaged, Stained is included in Poor Colour. Pea Seed Borne Mosaic Virus is included in Poor Colour.

Seed coats vary from grey, dark brown to black but may be depicted by other colours. Seed coats may be similar in appearance to various other defects such as Severely Damaged.

The photos below depict the minimum requirement of any colour to be classified as defective.

Defective

Green

Definition: Green is included in Poor Colour.

Seed Coat:
Seed coat appears intense green. It is recommended the kernel be inspected if immature grains are present.

Kernel:
Any level of green is classified as defective.

FABA BEANS: COMMON DEFECTS

Issued: 1st August 2023

Fungal Affected (e.g. Ascochyta)

Definition: Fungal Affected is included in Poor Colour.
Lesions are generally visible to the naked eye and appear intense dark brown to black. The lesion may be similar in colour to Severely Damaged or Stained and Weather Damaged. A lesion may appear on one or both sides of the seed coat or kernel.

A lesion greater than 20% coverage on any one side of the seed coat is considered defective.

Any lesion of any size on the kernel is defective.

Stained and Weather Damaged

Definition: Stained and Weather Damaged is included in Poor Colour.

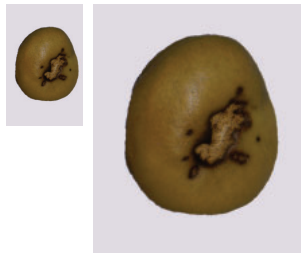
A general term used to describe visible damage to the seed coat that may or may not otherwise be defined or be distinguishable from other defects in these Standards. Weather Damage may also lead to a Loose Seed Coat or Shrivelled and Wrinkled.

Seed Coat:

Visible damage to the seed coat resulting in staining on the seed coat only. Seed coats may be discoloured or altered in size or shape.

Kernel:

Any damage to the kernel is classified as defective.



Defective
(Seed Coat Affected)

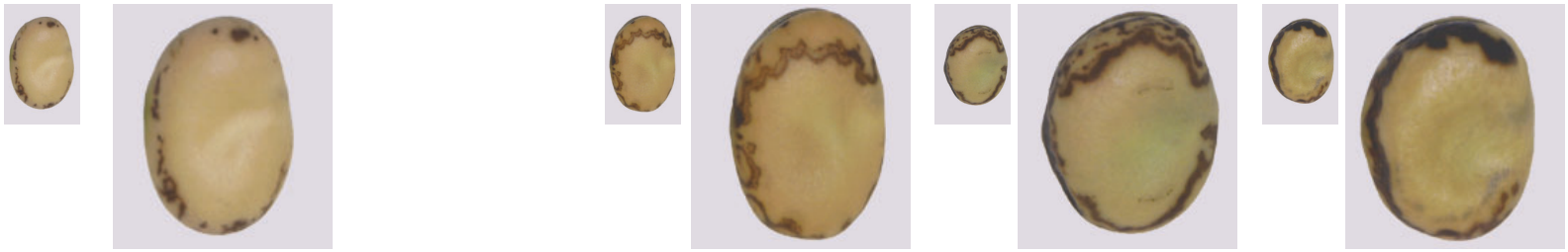
Defective (Kernel Affected)

Photos do not depict minimum required

FABA BEANS: COMMON DEFECTS

Pea Seed Borne Mosaic Virus

Definition: Pea Seed Borne Mosaic Virus is included in Poor Colour. Staining on the seed coat caused by the Pea Seed Borne Mosaic Virus.



Sound | **Defective**

LENTILS, RED

Whole Seed Sound

Kernel Sound

Note: Green Lentils are considered a contaminant in Red Lentils.

LENTILS, RED: COMMON DEFECTS

Issued: 1st August 2023

Shrivelled and Wrinkled

Definition: Visible damage to the seed coat or size and shape of grain whereby the grains are severely distorted and/or shrunken. Seed coats may show a level of discolouration depending on the extent of damage. Grains are often smaller than the majority in the sample.

Defective

LENTILS, RED: COMMON DEFECTS

Issued: 1st August 2023

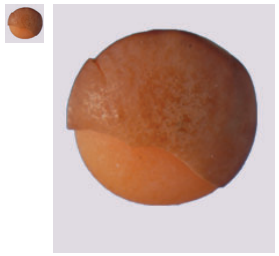
Broken, Chipped, Loose Seed Coat and Split

Definition: Breakage, cracking, peeling or splitting of the seed coat or chipping and splitting of the kernel in various forms as follows -

Seed Coat:

- Split Seed Coat - A split in the seed coat running more than half the entire width or across the entire width on one or both sides.
- Skin Damaged - A hole in the seed coat where more than 20% of the seed coat on any one side is missing.
- Loose Seed Coat (Peeling) - Where the seed coat is visibly falling off the kernel to any extent and not adhering tightly to the kernel.
- Missing Seed Coat - Where the entire seed coat is missing but the kernel remains intact.

Split Seed coat



Skin Damaged

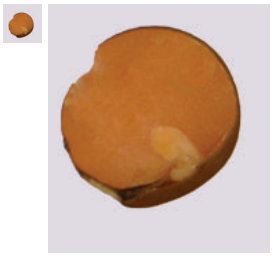
Loose Seed Coat (Peeling)

Missing Seed coat

Kernel:

- Chipped (Scratched) – A part of the kernel is damaged or removed.
- Broken - A split kernel with the seed coat still attached.
- Split – A split kernel with no seed coat attached

Chipped (Scratched)



Broken

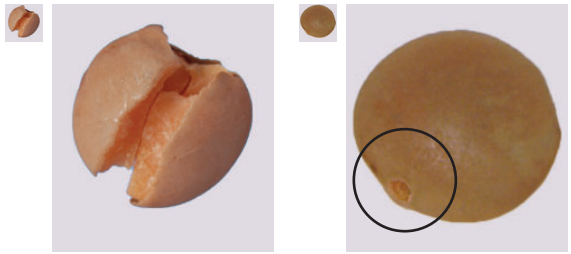
Split

LENTILS, RED: COMMON DEFECTS

Issued: 1st August 2023

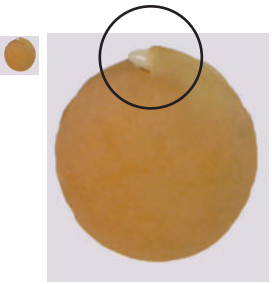
Insect Damaged

Definition: Any visible insect damage to the grain is to be classified as defective.



Sprouted

Definition: Seed coat has split and the primary root has emerged. This includes early and any further advanced stage of growth of the primary root. Includes grains where the primary root has been knocked off.



Severely Damaged

Definition: Damage to the grain causing it to become severely discoloured. A grain exhibits one or more of the following characteristics -

<u>Burnt / Heat Damaged:</u>
Heat Damaged or Burnt refers to those grains that have become severely discoloured. Affected grains appear dark brown, or in severe cases, blackened.

<u>Mould:</u>
Affected grains appear discoloured and visibly affected by mould.

<u>Diseased / Other Serious Visual Defects:</u>
Refers to those grains that have become significantly discoloured and/or have a serious visual defect that is not otherwise listed in these Standards.

Mould

Mould

Heat Damaged / Burnt

LENTILS, RED: COMMON DEFECTS

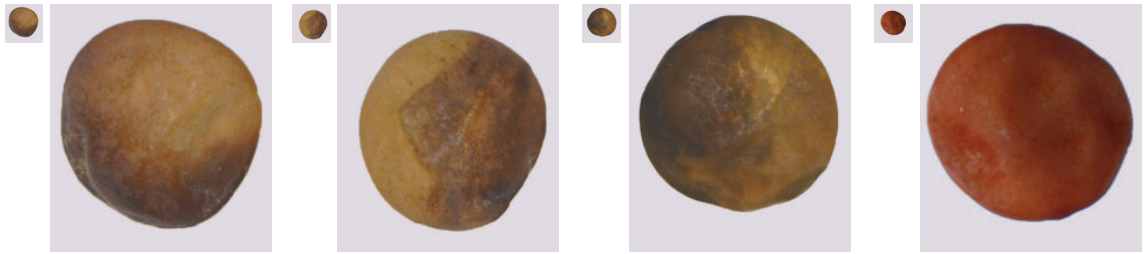
Issued: 1st August 2023

Poor Colour (Seed Coat)

Definition: Fungal Affected is included in Poor Colour. Stained and Weather Damaged is included in Poor Colour.

Seed coats vary from dark brown to black, but may be depicted by other colours. Seed coats may be similar in appearance to various other defects such as Severely Damaged. Does not include Contrasting Colour.

Where any poor colour is present on the seed coat, it is recommended the kernel also be inspected. Poor Colour kernel can only be assessed if the seed coat is removed.



Defective

Orange Tip

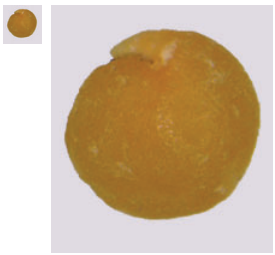
Definition: Seed coats have varying degrees of orange colour, generally in the germ area. Not included in Poor Colour.

Poor Colour Kernel - Dehulled Lentil

Definition: Poor Colour Kernel refers to excessive discolouration of the kernel often depicted as a green colour. Includes green, brown, black, yellow, bleached and chalky white kernels or any other discolouration.

Sound

Poor Colour Kernel



Poor Colour Kernel

Poor Colour Kernel

Blonde Kernel

Definition: Kernels are not uniformly orange in colour. Kernels appear yellow. Seed coat must be removed to determine the presence on the kernel.

LENTILS, RED: COMMON DEFECTS

Issued: 1st August 2023

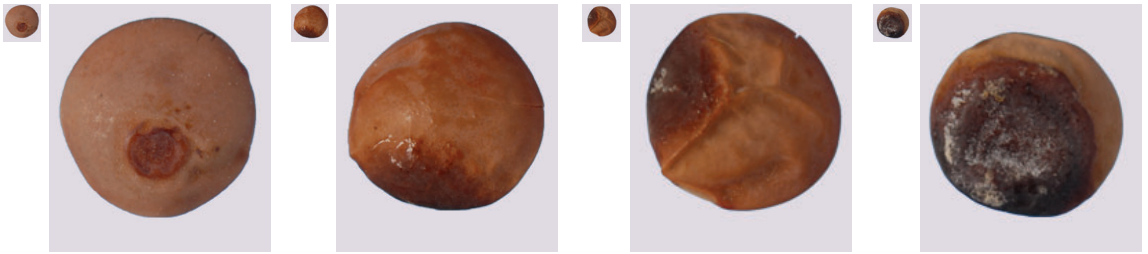
Fungal Affected

Definition: Fungal Affected is included in Poor Colour.

Lesions are generally visible to the naked eye and appear intense dark brown to black. The lesion may be similar in colour to Severely Damaged or Stained and Weather Damaged.

A lesion greater than 20% coverage on any one side of the seed coat is considered defective.

Any lesion of any size on the kernel is defective.



Defective

Stained and Weather Damaged

Definition: Stained and Weather Damaged is included in Poor Colour.

A general term used to describe visible damage to the seed coat or kernel that may or may not otherwise be defined or be distinguishable from other defects in these Standards. Seed coats and kernels may be discoloured or altered in size or shape. Weather damage may also lead to Loose Seed Coat or Shrivelled and Wrinkled.

Does not include Contrasting Colour.

Speckled - Sound

Defective

LENTILS, RED: CONTRASTING COLOURS

Issued: 1st August 2023

Contrasting Colours: Lentil variety definition chart

Grains with a colour not falling within the "main and acceptable variety seed coat variation" as depicted within the GREEN section of the chart are to be classified as Contrasting Colour

PBA Blitz[Φ]

Contrasting Colour	Main and acceptable variety seed coat variation					Contrasting Colour
						
Pale	Typical grey	Grey-green	Slightly marbled	Medium marbled	Strongly marbled	

PBA Herald XT[Φ]

Contrasting Colour	Main and acceptable variety seed coat variation					Contrasting Colour
						
Pale	Typical grey	Grey-green	Slightly marbled	Medium marbled	Strongly marbled	Black (totally marbled)

PBA Hurricane XT[Φ]

Contrasting Colour	Main and acceptable variety seed coat variation					Contrasting Colour
						
Pale	Typical grey	Grey-green				

Aldinga

Contrasting Colour	Main and acceptable variety seed coat variation					Contrasting Colour
						
	Typical pale		Slightly marbled	Medium marbled	Strongly marbled	Grey (totally marbled)

August 2014 **Contrasting colour is genetic variation within a variety. Grey-green seed coats can occur with early maturity time in grey seed type lentils.**

LUPINS, ANGUSTIFOLIUS

Lupin - Angustifolius Sound

Lupin - Albus Sound

Note: Albus Lupins are considered a contaminant in Angustifolius Lupins.

LUPINS, ANGUSTIFOLIUS: COMMON DEFECTS

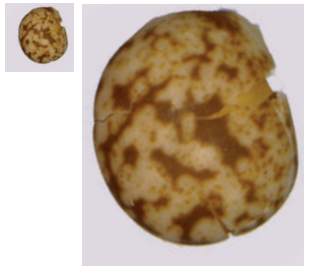
Issued: 1st August 2023

Broken, Chipped, Loose Seed Coat and Split

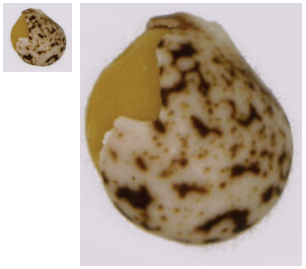
Definition: Breakage, cracking, peeling or splitting of the seed coat or chipping and splitting of the kernel in various forms as follows -

Seed Coat:

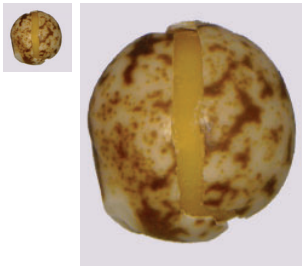
- Split Seed Coat - A split in the seed coat running more than half the entire length or across the entire width on one or both sides.
- Skin Damaged - A hole in the seed coat where more than 20% of the seed coat on any one side is missing.
- Loose Seed Coat (Peeling) - Where the seed coat is visibly falling off the kernel to any extent and not adhering tightly to the kernel.
- Missing Seed Coat (Fully De-Coated - WA) - Where the entire seed coat is missing but the kernel remains intact.



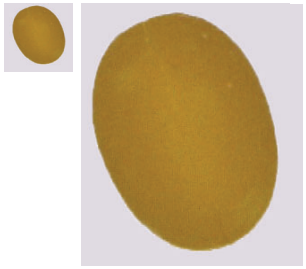
Split Seed coat



Skin Damaged



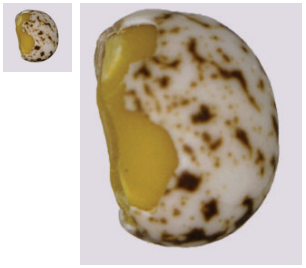
Loose Seed Coat (Peeling)



Missing Seed Coat (Fully De-Coated- WA)

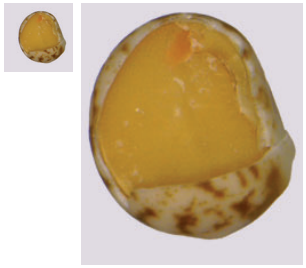
Kernel:

- Chipped (Scratched) – A part of the kernel is damaged or removed.
- Broken - A split kernel with the seed coat still attached.
- Split – A split kernel with no seed coat attached



Chipped (Scratched)

Broken (Side)



Broken

Split (Side)

Split

Manganese Deficiency

Definition: Splitting of the seed coat to expose the kernel. It is not considered a defect provided no damage to the exposed kernel has occurred.

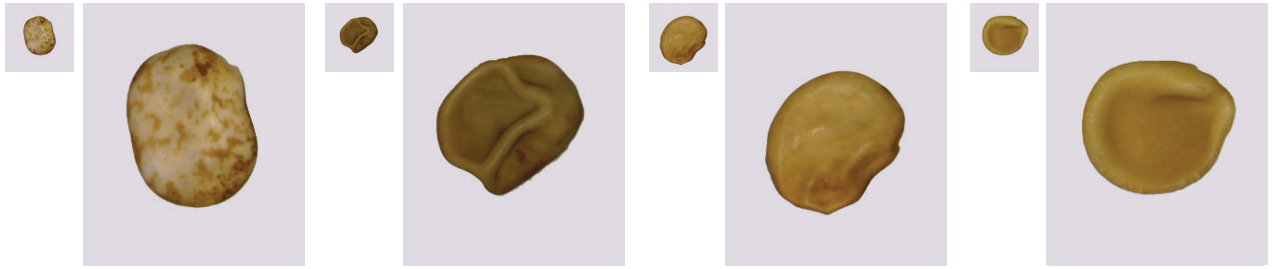
Sound

LUPINS, ANGUSTIFOLIUS: COMMON DEFECTS

Issued: 1st August 2023

Shrivelled and Wrinkled

Definition: Visible damage to the seed coat or size and shape of grain whereby the grains are severely distorted and/or shrunken. Seed coats may show a level of discolouration depending on the extent of damage. Grains are often smaller than the majority in the sample.



Insect Damaged

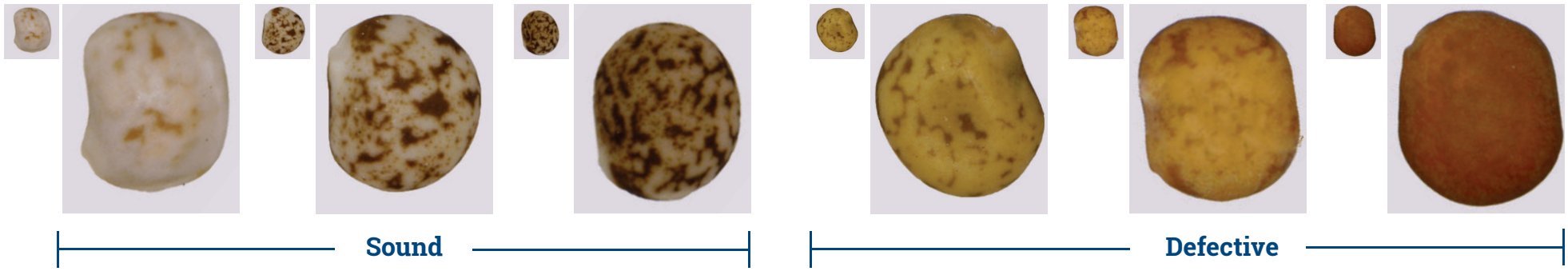
Definition: Any visible insect damage to the grain is to be classified as defective.

LUPINS, ANGUSTIFOLIUS: COMMON DEFECTS

Issued: 1st August 2023

Poor Colour (Discoloured-WA)

Definition: Seed coats vary from yellow to tan, dark brown to black, but may be depicted by other colours. Seed coats may be similar in appearance to various other defects such as Severely Damaged.

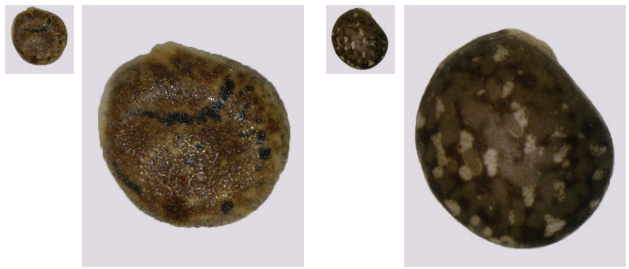


Phomopsis

Definition: Grains appear sound with a fungal growth readily visible on the seed coat. If kernels are not sound, refer to Severely Damaged.

Bitter Dark (Bitter Variety-WA)

Definition: These varieties are identifiable mainly by their colour which is much darker than acceptable lupins.



LUPINS, ANGUSTIFOLIUS: COMMON DEFECTS

Issued: 1st August 2023

Severely Damaged

Definition: Damage to the grain causing it to become severely discoloured. A grain exhibits one or more of the following characteristics -

Burnt / Heat Damaged:

Heat Damaged or Burnt refers to those grains that have become severely discoloured. Affected grains appear dark brown, or in severe cases, blackened.

Mould:

Affected grains appear discoloured and visibly affected by mould. Does not include Phomopsis.

Diseased / Other Serious Visual Defects:

Refers to those grains that have become significantly discoloured and/or have a serious visual defect that is not otherwise listed in these Standards.

Heat Damaged / Burnt

Mould

Sprouted

Definition: Seed coat has split and the primary root has emerged. This includes early and any further advanced stage of growth of the primary root. Includes grains where the primary root has been knocked off.

Pickling Compounds or Artificial Colour

Definition: An unnatural surface colour and/or colour that rubs off. Any grains that are artificially coloured, regardless of intensity, are defective.

Note: This photograph is to illustrate artificial colour and appearance only. A **nil tolerance** applies to any pickling compounds, regardless of intensity or coverage or colour.

MAIZE, FEED

Sound

MAIZE, FEED: COMMON DEFECTS

Issued: 1st August 2023

Heat Damaged / Bin Burnt

Definition: Grains appear reddish brown, or in severe cases, blackened. Heat Damaged / Bin Burnt is included in the definition of Damaged.

Insect Damaged

Definition: Any visible insect damage to the grain is to be classified as defective.

Broken

Definition: Grains that have 1/4 or more missing from the Kernel.

Sprouted

Definition: Sprouted is included in Damaged.

Grains in which the covering of the germ is split and the shoot has broken through the seed coat. Grains that have had the germ knocked off or scalloped.

MAIZE, FEED: COMMON DEFECTS

Issued: 1st August 2023

Storage Mould

Definition: Grains appear discoloured and visibly affected by mould.

Note: If any musty odour is detected a nil tolerance applies.

Dead

Definition: Grains that are at least 50% opaque.

Fungal Affected

Definitions:

Silk Cut:
Easily identified where the pericarp is split and the starch appears to be popping out of the kernel. Silk Cut is included in Damaged.

Starburst:
Best identified as spider web like streaks radiating down the kernel from the point of silk attachment. These streaks are corroded channels within the pericarp caused by fungal growth. Air in the channels breaks the transparency of the pericarp so the yellow aleurone beneath cannot be seen. Star Burst is included in the definition of Dead, Mouldy, Storage Mould.

Silk Cut

Star Burst

MAIZE, FEED: COMMON DEFECTS/CONTAMINANTS

Pickling Compounds or Artificial Colouring

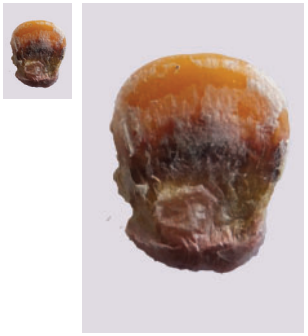
Definition: An unnatural surface colour and/or colour that rubs off. Any grains that are artificially coloured, regardless of intensity, are defective.

Note: This photograph is to illustrate artificial colour and appearance only. A **nil tolerance** applies to any pickling compounds, regardless of intensity or coverage or colour.

Field Fungi

Definition: Included in Damaged.

Seed coat is greater than approximately 50% discoloured. The visible discolouration of affected grains can vary from dark grey, brown to black in colour.

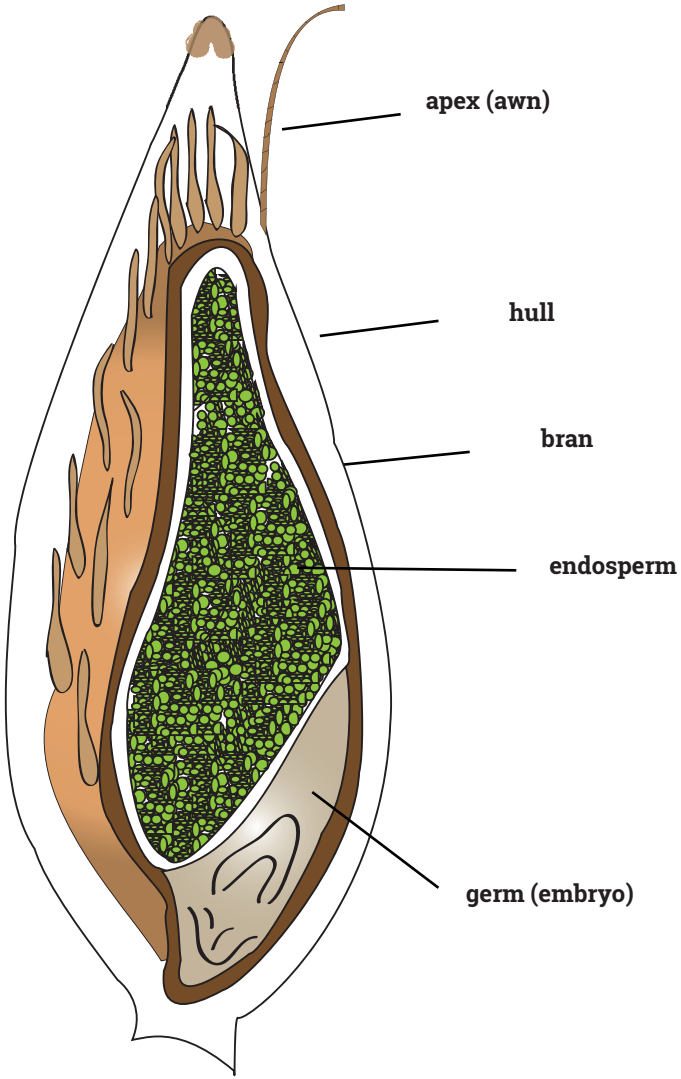


Kernel Red Streak

Definition: This is not a defect and kernels are considered sound when identified as Kernel Red Streak.

Sound

OATS



Awn End of Grain

Groat Sound

Oat Sound

Germ End of Grain

OATS: COMMON DEFECTS

Issued: 1st August 2023

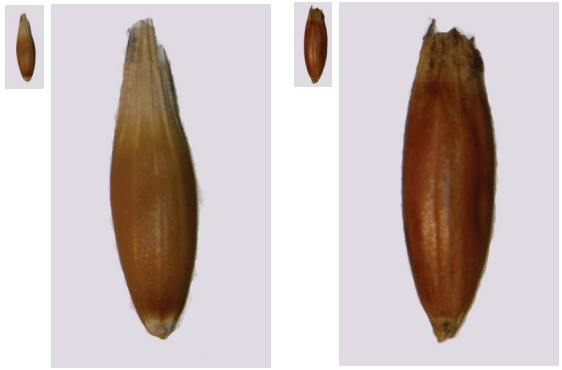
Severely Damaged

Definition: Damage to the grain causing it to become severely discoloured. A grain exhibits one or more of the following characteristics -

Burnt / Heat Damaged:
Heat Damaged or Burnt refers to those kernels that have become discoloured. Affected grains appear dark brown, or in severe cases, blackened. May also appear discoloured under the husk on the groat.

Mould:
Affected grains appear discoloured and visibly affected by mould. Note that light Septoria discolouration similar to Mould is not included in the definition of Severely Damaged - refer to Stained Grains.

Diseased / Other Serious Visual Defects:
Refers to those kernels that have become significantly discoloured and / or have a serious visual defect that is not otherwise listed in these Standards. Does not include Field Fungi affected grains, refer to Field Fungi.



Sound - Variety differs | **Heat damaged**

Field Fungi (Spotted Mould Affected-WA)

Definition: Individual kernels where the seed coat has grey to black spotting occurring anywhere on the grain.

Coverage greater than approximately 10% of the grain surface is considered defective, otherwise classified as sound.

Grains that are soft (that are not classified as Sappy) and/or emit a mouldy odour are to be classified as Objectionable Material.

Dorsal | **Dorsal** | **Ventral** | **Ventral**

OATS: COMMON DEFECTS

Issued: 1st August 2023

Stained Grains (Heavily Discoloured-WA) inc. Septoria

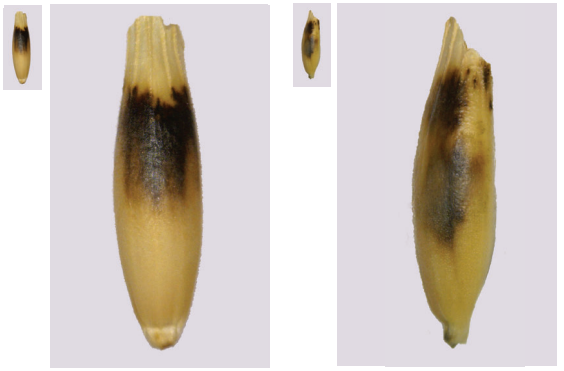
Definition: Grains where greater than approximately 50% of the grain surface is discoloured. Various colours may be exhibited such as brown to black. Septoria is to be included in this definitition, except in WA.

Grains that are affected by Field Fungi or Mould are not included in the definition of Stained Grains.

Where staining has occurred, it is recommended the husk be removed and the Groat examined.

Septoria (WA)

Definition: A fungal infection that causes light to dark discolouration on the husk and/or groat.



Side

Stained Groats (Except WA)

Definition: This defect is checked where Stained Grains are present in the sample. Where this staining has occurred, it is recommended the husk be removed and the Groat examined.

Any discolouration from the normal colour of the Groat is defective.

Sound - Dorsal | Sound - Ventral | Stained - Side | Stained - Dorsal | Stained - Dorsal | Stained - Ventral

OATS: COMMON DEFECTS

Issued: 1st August 2023

Insect Damaged

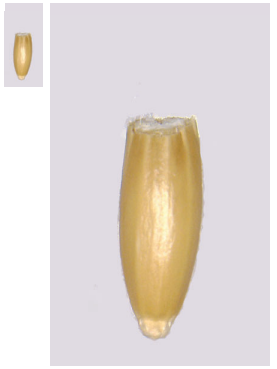
Definition: Any visible insect damage to the grain is to be classified as defective.

Sprouted

Definition: The grain has begun the germination process. A kernel that is sprouted is one where the shoot is visibly seen growing out from the germ.

Damaged Grains

Definition: Grain with a quarter or more of the grain missing. This includes any mechanical damage to the germ.



Dry Green or Sappy

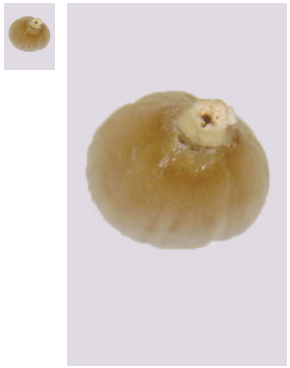
Definition Dry Green: Grain surface is distinctly green. Grains are usually dry and hard.

Definition Sappy: Grains are generally soft when pressed. They may or may not be green. Any level of sappiness is classified as defective.

Dry Green

Shot

Definition: The covering of the germ is split, but without further development of the shoot.

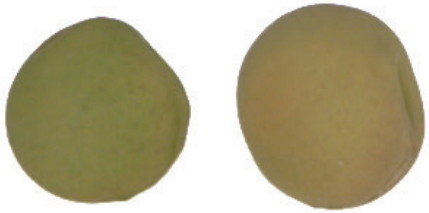


PEAS, FIELD

Sound

Typical White type Pea

Typical Blue type Pea



Acceptable colour range for Parafield type Peas

Typical shape for Parafield type Peas

Typical shape for Kaspa type Peas

Acceptable colour range for Kaspa type Peas

PEAS, FIELD: COMMON DEFECTS

Issued: 1st August 2023

Severely Damaged

Definition: Damage to the grain causing it to become severely discoloured. A grain exhibits one or more of the following characteristics -

Burnt / Heat Damaged:

Heat Damaged or Burnt refers to those grains that have become severely discoloured. Affected grains appear dark brown, or in severe cases, blackened.

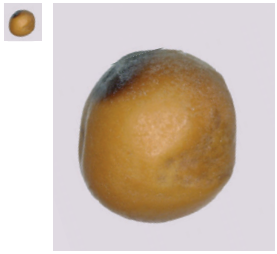
Mould:

Affected grains appear discoloured and visibly affected by mould.

Diseased / Other Serious Visual Defects:

Refers to those grains that have become significantly discoloured and/or have a serious visual defect that is not otherwise listed in these Standards.

Burnt / Heat Damaged



Mould

PEAS, FIELD: COMMON DEFECTS

Issued: 1st August 2023

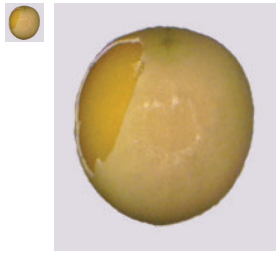
Broken, Chipped, Loose Seed Coat and Split

Definition: Breakage, cracking, peeling or splitting of the seed coat or chipping and splitting of the kernel in various forms as follows -

Seed Coat:

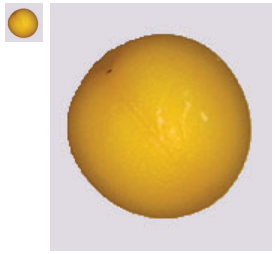
- Split Seed Coat - A split in the seed coat running more than half the entire width or across the entire width on one or both sides.
- Skin Damaged - A hole in the seed coat where more than 20% of the seed coat on any one side is missing.
- Loose Seed Coat (Peeling) - Where the seed coat is visibly falling off the kernel to any extent and not adhering tightly to the kernel.
- Missing Seed Coat - Where the entire seed coat is missing but the kernel remains intact.

Split Seed coat



Skin Damaged

Loose Seed Coat (Peeling)



Missing Seed coat

Kernel:

- Chipped (Scratched) - A part of the kernel is damaged or removed.
- Broken - A split kernel with the seed coat still attached.
- Split - A split kernel with no seed coat attached.

Chipped (Scratched)

Broken

Split

PEAS, FIELD: COMMON DEFECTS

Issued: 1st August 2023

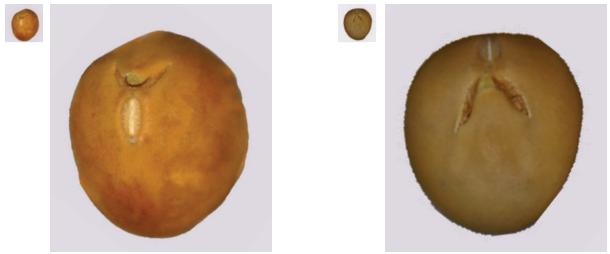
Shrivelled and Wrinkled

Definition: Visible damage to the seed coat or size and shape of grain whereby the grains are severely distorted and/or shrunken with distinct ridges and/or pinching. Seed coats may show a level of discolouration depending on the extent of damage. Grains are often smaller than the majority in the sample.

Sound

Sprouted

Definition: Seed coat has split and the primary root has emerged. This includes early and any further advanced stage of growth of the primary root. Includes grains where the primary root has been knocked off.



Sound

Insect Damaged

Definition: Any visible insect damage to the grain is to be classified as defective.

Field Grub
Insect Damaged

PEAS, FIELD: COMMON DEFECTS

Issued: 1st August 2023

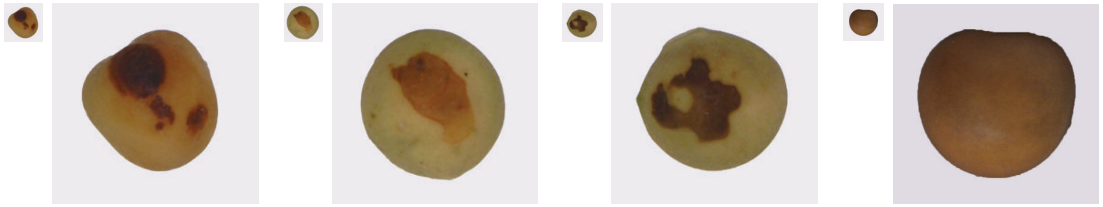
Poor Colour

Definition:

Seed Coat:

Seed coats vary from dark brown to black but may be depicted by other colours. Seed coats may be similar in appearance to various other defects such as Severely Damaged.

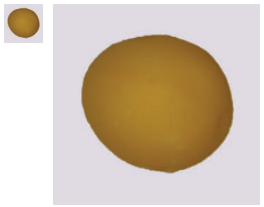
Where poor colour is present on the seed coat, it is recommended the kernel also be inspected.



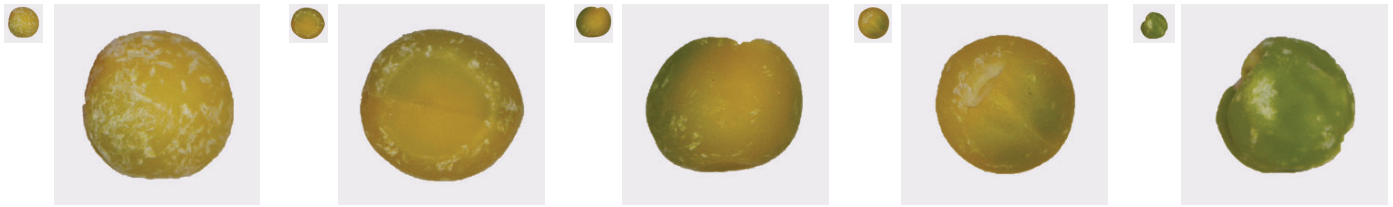
Defective

Kernel:

Any level of discolouration on the kernel is classified as defective. Where green kernels exist, the level of green colouring classified as defective is shown in the photos below.



Sound Kernel



Defective

SORGHUM

Sound

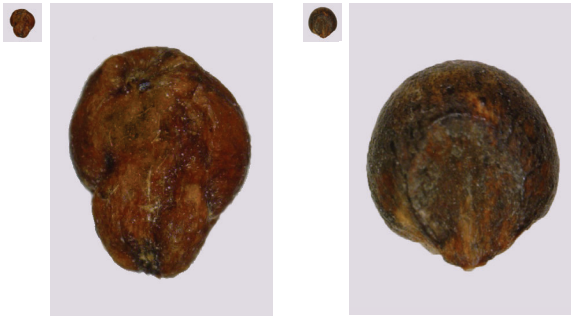
SORGHUM: COMMON DEFECTS

Issued: 1st August 2023

Severely Damaged

Definition: Heat Damaged / Burnt, diseased or other serious visual defects.

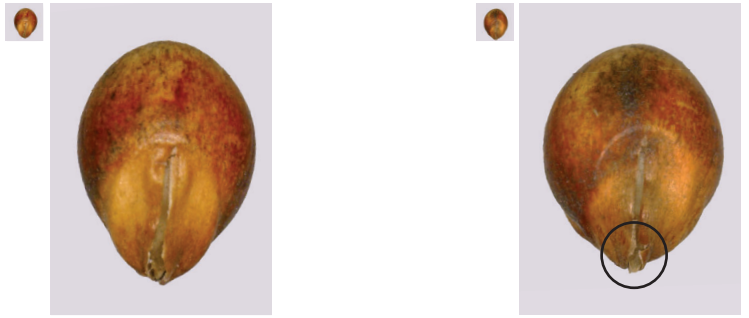
Kernels have become significantly discoloured. Grains appear dark brown or in severe cases, blackened.



Sprouted

Definition: The shoot is visibly extending from any part of the germ.

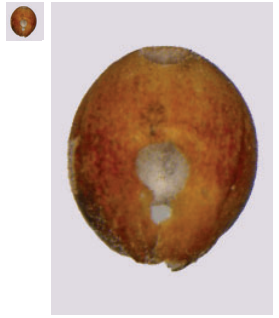
Grains with pin holes are not included in this definition.



Sound **Sprouted**

Insect Damaged

Definition: Any visible insect damage to the grain is to be classified as defective.

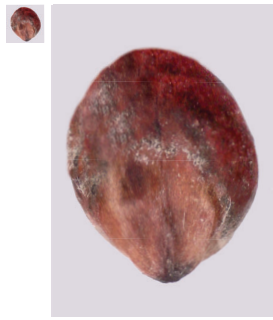


SORGHUM: COMMON DEFECTS

Issued: 1st August 2023

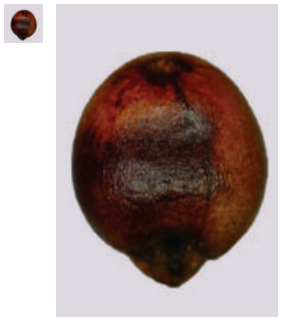
Mould

Definition: Grains appear discoloured and visibly affected by mould.

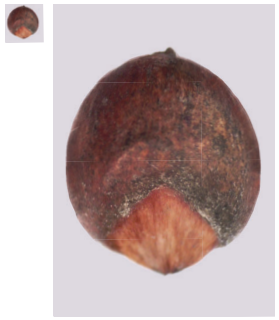


Field Fungi

Definition: Kernels affected by the growth of fungi on the seed coat. The fungal growth can vary in colour from white, to grey, to black. It does not refer to the more serious Moulds.



Stained Sound



Field Fungi Defective

SORGHUM: COMMON DEFECTS/CONTAMINANTS

Issued: 1st August 2023

Honeydew

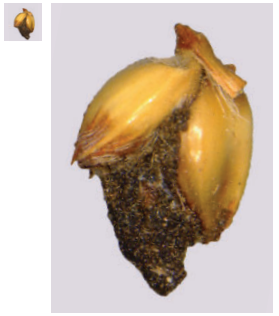
Definition: Honeydew is acceptable if the grain is able to flow freely.

Honeydew is a sticky exudate produced by the sorghum plant in response to any predator attack, including Ergot. Honeydew oozes out of the flowers and drips onto leaves of the sorghum plant. It causes seeds to stick together and can make crops difficult to harvest and prevent harvested grain from running through equipment.

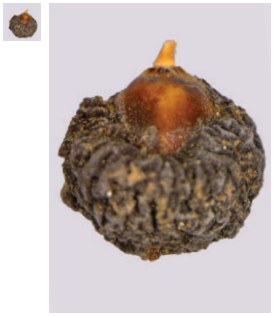
Sorghum Ergot

Definition: Any visible ergot to the grain is to be classified as defective.

Sorghum Ergot, *Claviceps africana*, may result in the accumulation of a grey/white fungal mass in empty seed glumes. *Cerebella spp.* is not a true ergot but is a fungus that often grows on the *Claviceps africana*, producing a large black mass. *Cerebella spp.* is included in Sorghum Ergot.

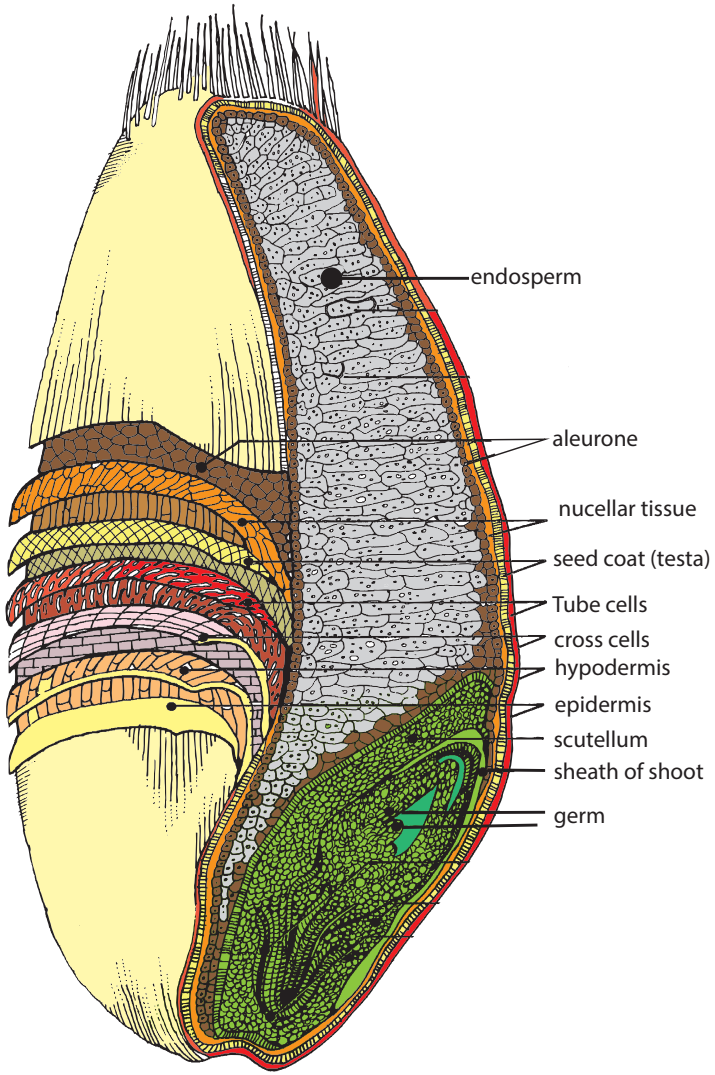


Claviceps africana



Cerebella spp.

WHEAT



Wheat Grain

Brush End of Grain

White Wheat Sound

Red Wheat Sound

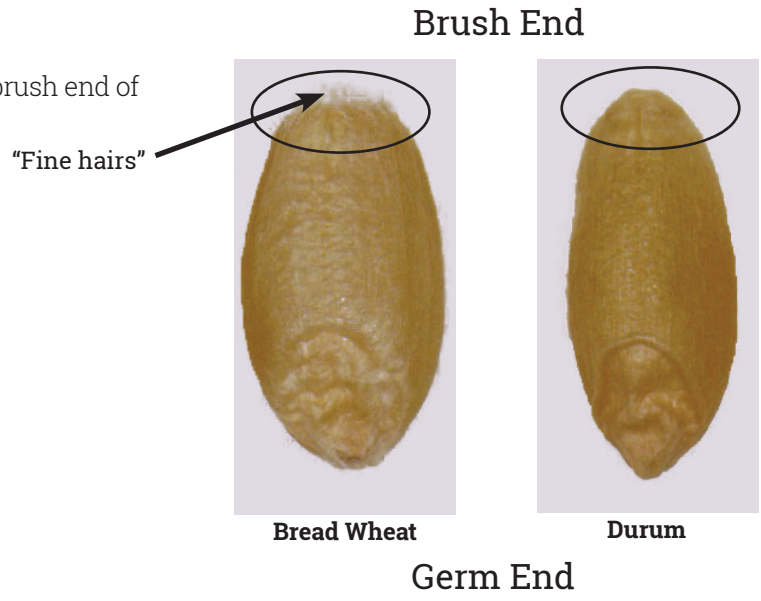
Germ End of Grain

WHEAT: DURUM

Issued: 1st August 2023

Durum Identification

Description: Bread Wheat can be visually distinguished from Durum by the "fine hairs" on the brush end of the grain. These hairs are only associated with Bread Wheat varieties.



Bread Wheat **Durum**

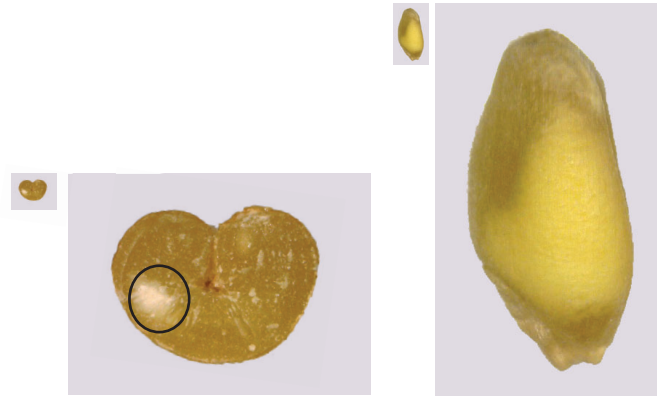
Vitreous Kernels

Description: Vitreous grains will appear uniformly bright and translucent. Non vitreous grains will be dull and opaque, or will contain dark, opaque sections that are clearly visible within the remaining translucent section of the grain.

Bleached grains may be difficult to ascertain if they are vitreous.

Any level of non-vitreous results in the grain being classified as non-vitreous.

Bleached Sound



Non-Vitreous **Non-Vitreous Side**

Any level of non-vitreous results in non-vitreous classification.

WHEAT: COMMON DEFECTS

Issued: 1st August 2023

Pink Stained

Definition: Grains with distinct pink discolouration.

Grains that are pink but also contain a white to light grey fungal like discolouration over more than approximately 50% of the seed coat surface are to be classified as "White Grain Disorder / Head Scab".

Ventral | Dorsal

Insect Damaged

Definition: Any visible insect damage to the grain is classified as defective.

Stained

Definition: A distinct dark brown to black discolouration on the germ end that, in severe cases, may progress to other parts of the grain such as the crease. Grains are commonly referred to as "black point" or "black tip". Includes any staining beyond the minimum and up to 50% of the entire grain surface. For staining level greater than 50%, refer to Field Fungi.

Includes grains that show streaking anywhere on the surface of the grain, and brush-end staining beyond the minimum. Also includes adherence of contaminants such as soil, dust, plant parts and other material.

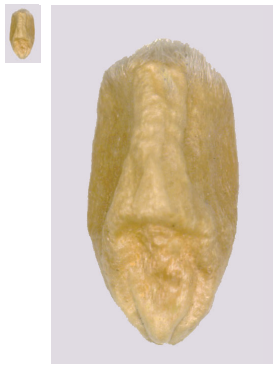
Plant Material | Streaking | Brush Ventral | Brush Dorsal | Stained Crease | Black Tip

WHEAT: COMMON DEFECTS

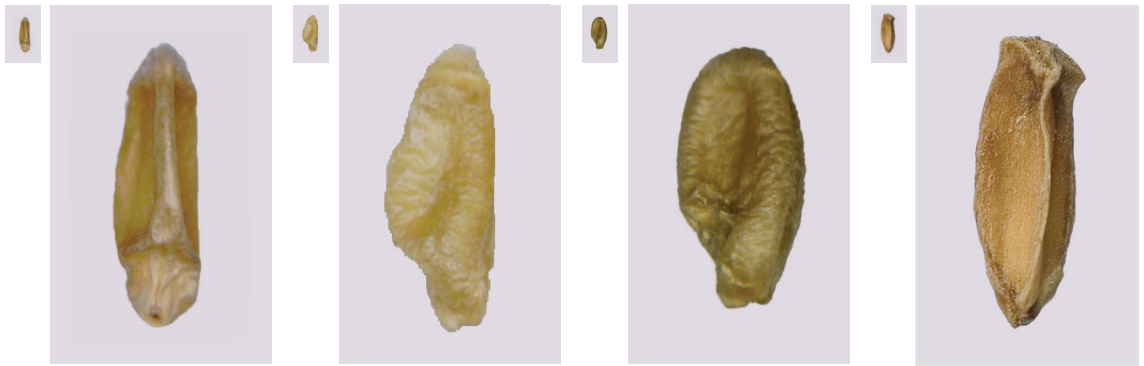
Issued: 1st August 2023

Distorted

Definition: Grains generally have the appearance of full sized kernels with little or no structure on both dorsal sides of the grain, and are typically grey to blue in colour. Does not include pinched grain.



Sound



Blue Hue

Above 2mm screen only

Sprouted

Definition: The covering of the germ is split. It includes early and any further advanced stage of growth of the germ. Kernels exhibiting early stages of sprouting are those where the covering of the germ is split, but without further development of the shoot.

Grains with pin holes are not included in this definition.

Sound - Pin Hole

Scalloped
Not defective

Dry Green or Sappy

Definition Dry Green: Grain surface is distinctly green. Grains are usually dry and hard.

Definition Sappy: Grains are generally soft when pressed. They may or may not be green. Any level of sappiness is classified as defective.

Dry Green

WHEAT: COMMON DEFECTS

Issued: 1st August 2023

Field Fungi

Definition: Individual kernels where more than half (50%) of the seed coat is discoloured. Discolouration can vary from dark grey, brown to black in colour.

Grains that are approximately 50% or less discoloured are to be classified as Stained.

Severely Damaged

Definition: Damage to the grain causing it to become severely discoloured. A grain exhibits one or more of the following characteristics -

Burnt / Heat Damaged:

Heat Damaged or Burnt refers to those grains that have become severely discoloured. Affected grains appear reddish brown, dark brown or in severe cases, blackened.

Mould:

Affected grains appear discoloured and visibly affected by mould.

Diseased / Other Serious Visual Defects:

Refers to those grains that have become significantly discoloured and/or have a serious visual defect that is not otherwise listed in these Standards.

Heat Damaged | **Heat Damaged (Blackened)** | **Mould** | **Other Serious Visual Defect**

WHEAT: COMMON DEFECTS

Issued: 1st August 2023

White Grain Disorder / Head Scab

Definition: Grains appear white to light grey but may also contain a pink discolouration. Discolouration must be over more than approximately 50% of the seed coat surface. If the discolouration is less than approximately 50% of the seed coat surface, grains may be classified as sound.

Grains may also appear flaky with a white discolouration and may display some level of shrivelling.

WHEAT: COMMON DEFECTS/CONTAMINANTS

Issued: 1st August 2023

Ball Smuts

Definition: Grains infected by the spores of the fungus *Tilletia caries*. Appearance of pale, plump, slightly oversized grains. Easily crushed between the fingers and contain a mass of black powder (spores) with a distinctive rotten egg smell. This may also be called Stinking Smut or Bunt.

Pickling Compounds / Artificial Colouring (Pickled Wheat-WA)

Definition: An unnatural surface colour and/or colour that rubs off. Any grains that are artificially coloured, regardless of intensity, are defective.

Note: These photographs are to illustrate artificial colours and appearance only. A **nil tolerance** applies to any pickling compounds, regardless of intensity or coverage.

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