



Official Grain Grading Guide

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12. Domestic mustard seed

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Classes

Domestic mustard seed is classed as yellow, brown or oriental, or mixed. The class forms part of the grade name; for example, *Domestic Mustard Seed, Sample Canada Yellow Account Heated*.

Identifying classes of domestic mustard seed

| Class | Colour | Approximate size | Shape | Surface |
|----------|---|--|-------------------|---|
| Yellow | Light creamy-yellow to yellow Occasional seed is light or yellowish brown | 2 to 3 mm in diameter | Spherical or oval | Textured, similar to an orange peel, hilum area—small white spot on a deep yellow to light tan circular area |
| Brown | Reddish-brown to dark-brown | 2 mm or less in diameter | Spherical or oval | Predominant netting, ridges are thicker than oriental mustard, hilum area – white on a black or darker brown circular area |
| Oriental | Predominantly yellow to dark-yellow, with some seeds ranging from light brown to brown | 1.2 to 2.0 mm in width, 1.6 to 3.0 in length | Oval | Predominant netting, not as predominant as brown mustard, ridges are fine, hilum area – white on a darker yellow to lighter brown circular area |
| Mixed | Yellow and brown mustard seed containing less than 90.0% of one class See also <i>Domestic mustard seed, oriental: Other classes</i> | | | |

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as “any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain.” Dockage is removed by following the cleaning procedures described in this chapter.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after normal cleaning has been completed.

Dockage not reported

- ▲ **Important:** Dockage is not reported for samples grading
 - *Domestic Mustard Seed, Sample Canada (class) Account Fireburnt*
 - *Domestic Mustard Seed, Sample Salvage*
 - *Domestic Mustard Seed, Sample Condemned*

Normal cleaning procedures

- ▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

| | |
|-----------------------|------------|
| Feed control | #3 |
| Air control | #7 |
| Riddle | No. 000 |
| Top sieve | Blank tray |
| Centre sieve | none |
| Bottom sieve | none |
| Sieve cleaner control | off |

2. You also need the following hand sieves:

| Round-hole hand sieves | Slotted hand sieves |
|------------------------|---------------------|
| No. 5.5 | No. .028 |
| No. 6 | No. .032 |
| No. 6.5 | No. .035 |
| No. 7 | No. .038 |
| No. 7.5 | No. .040 |

3. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
 - Official samples should be at least 900 g.
 - Unofficial samples should be at least 750 g.
4. For hand sieving use approximately 250 g.
 - ▲ **Important:**
 - Ensure you start with the right sized sieves.
 - When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre to one side, to the other side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.
 1. Use whichever round-hole sieve will achieve maximum removal of large material with minimum loss of domestic mustard seed. Nest the round-hole sieve over the slotted sieve.
 2. Use whichever slotted sieve will achieve maximum removal of weed seeds with minimum loss of domestic mustard seed.
5. Combine the separated, cleaned 250-g portions.
6. Turn on the Carter dockage tester.
7. Pour the sample into the hopper.
8. After the sample has passed through the machine, turn off the machine.
 - Reduce the air setting to #5 if there is a large loss of whole, reasonably sound seed.
 - If the sample after normal cleaning with air control at #7 qualifies only for *Sample* grade, you must start all over again. Recombine the sample and whatever material has been removed, and re-assess dockage with the air control at #5.
9. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- Material remaining on top of the round-hole hand sieve
- Material passing through the slotted hand sieve
- Material passing over the No. 000 riddle
- Material removed by aspiration
- Material removed by *Cleaning for grade improvement*

Cleaning for grade improvement

If the grade of a delivery can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after normal cleaning.

Carter dockage tester

1. After normal cleaning, examine the material to be removed and select your equipment according to the material you want to remove. See the table *Cleaning for grade improvement— domestic mustard seed*.
2. Pass the sample through the Carter dockage tester.
3. Weigh the additional dockage and add it to the original dockage.

Spiral cleaner— for yellow mustard seed and only upon request

Operating procedures

1. The sample to be cleaned by the spiral is the net sample remaining after normal cleaning procedures.
2. Pour the sample into the feed hopper at the top of the spiral. Once the sample has passed through the spiral, lightly tap it to remove any lodged seeds remaining on the flights..
3. Collect the seeds that have discharged from the bottom spout (spout closest to the core of the cleaner)
4. Determine the percentage by weight of the seeds that have discharged and determine if more than 5.0% of yellow mustard has been removed per grade improvement.

Reporting procedures

1. Where the grade is not improved or more than 5.0% of mustard is removed for each grade improvement, the grade and dockage will not be revised.
2. Where the grade can be improved while removing less than 5.0% of domestic mustard for each grade improvement, the certificate will state only the grade and dockage achieved through use of the spiral cleaner.

Cleaning for grade improvement—domestic mustard seed

| Material to be removed | Equipment | Effect on composition of dockage | |
|---|---|---|-----------------------------|
| Excessive inseparable weed seeds or damaged mustard seeds for all classes of mustard seed | Spiral cleaner—on request, for yellow mustard seed only | Not more than about 5.0% of domestic mustard seed may be removed for each grade improvement achieved. | |
| | Carter dockage tester set as follows: | | |
| | Feed control | | #3 |
| | Air control | | #7 |
| | Riddle | | No. 000 |
| | Top sieve | | No. 4.5 or No. 5 round-hole |
| | Centre sieve | | blank tray |
| | Bottom sieve | | none |
| | Sieve cleaner control | off | |
| Canola or wild mustard in yellow mustard seed | Carter dockage tester set as follows: | | |
| | Feed control | #3 | |
| | Air control | off | |
| | Riddle | No. 000 | |
| | Top sieve | none | |
| | Centre sieve | No. 4.5 or No. 5 round-hole | |
| | Bottom sieve | blank tray | |
| | Sieve cleaner control | off | |
| | | The material passing through the sieve is included in the dockage. Not more than 5.0% of sound domestic mustard seed may be removed for each grade improvement achieved. | |

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
 - The percentage by gross weight to the nearest 0.1% and the grade of mustard.
 - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
 - The percentage of dockage.

Example

95.0% Domestic Mustard Seed, No. 1 CAN Yellow
4.0% Rye, No. 2 CW
1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. For grading, percentages by weight refer to percentages of the net weight.

Kernel counts (K)

A kernel count is the number of kernel-sized pieces in a 500 g sample.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as “any pesticide, herbicide or desiccant.”

Crush

A crush is one pass of the roller under firm pressure over a 100-seed stick on masking tape.

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

| When the concentration of the grading factor is . . . | Then use . . . |
|---|---|
| Low | Optimum portion size |
| High | Minimum portion size or more (do not use less) |

Values in the table on the next page represent a range of recommended portions of samples for grading.

Grading—Domestic Mustard Seed, Brown

Representative portion of domestic mustard seed, brown for grading, grams

| Grading factor | Minimum | Optimum | Export |
|--------------------------|----------------|----------------|----------------|
| Canola | 5 | 25 | 5-25 |
| Cockle | 5 | 50 | 5-50 |
| Colour | working sample | working sample | working sample |
| Conspicuous admixtures | 5 | 50 | 5-50 |
| Damage | 5 | 10 | 10 |
| Distinctly detrimental | 5 | 50 | 5-50 |
| Distinctly green | 5 crushes | 10 crushes | 10 crushes |
| Ergot | 100 | 500 | 500 |
| Excreta | working sample | working sample | working sample |
| Fertilizer pellets | 1000 | 1000 | 1000 |
| Fireburnt | working sample | working sample | working sample |
| Heated | 5 crushes | 10 crushes | 10 crushes |
| Inconspicuous admixture | 5 | 25 | 5-25 |
| Odour | working sample | working sample | working sample |
| Other classes | 2 | 5 | 2-5 |
| Rime | 5 | 10 | 10 |
| Sclerotinia sclerotiorum | 100 | 500 | 500 |
| Soft earth pellets | 100 | working sample | working sample |
| Stones | 100 | working sample | working sample |
| Wild mustard seed | 5 | 25 | 5-25 |

Grading factors

Canola (CNL)

In brown mustard, canola is classed as *Inconspicuous admixture*.

- ▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Representative portion for analysis

Minimum—5 g

Optimum—25 g

Export—5-25 g

Classes

Domestic mustard seed is classed as yellow, brown or oriental, or mixed. The class forms part of the grade name; for example, *Domestic Mustard Seed, Sample Canada Brown, Account Heated*. For a description of classes, see *Identifying classes of domestic mustard seed*.

Cockle (COC)

Cockle, or cow cockle, is a hard roundish seed with a dull surface covered with numerous small bumps giving the seed a rough spiky appearance. Colour can be deep black, bluish-black or orangish-brown. In brown mustard, cockle is part of *Conspicuous admixture*.

Representative portion for analysis

Minimum—5 g

Optimum—50 g

Export—5-50 g

Procedures

Use a microscope to examine the sample.

Colour (CLR)

In analysing colour, consider

- The general degree of maturity
- The amount and degree of discolouration, such as from weathering
- The proportion of damaged seeds, which are distinctly green or otherwise colour-damaged. See *Damage* and *Distinctly green*.
- The amount of rime—light rime is considered in the overall appearance of the sample. See *Damage*.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Conspicuous admixture (CADMX)

Conspicuous admixture is also called *Conspicuous inseparable seeds* in the grade determinants tables. In brown mustard, conspicuous admixture includes

- Small seeds or broken seeds of other grains
- Weed seeds such as cow cockle, lamb's-quarters, ball mustard, pigweed, cleavers, smartweed and lady's-thumb.
- Any conspicuous foreign material except stones and soft earth pellets

Representative portion for analysis

Minimum—5 g

Optimum—50 g

Export—5-50 g

- ▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.
-

Contaminated grain

- ▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the “*Canada Grain Act*” as; “Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*.”

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Domestic Mustard Seed, Sample Canada Brown Condemned*.

Damage (DMG)

Damaged seeds include those that are

- Distinctly shrunken or shrivelled
- Badly discoloured from mould
- Completely and densely covered with rime
- Excessively weathered, sprouted, distinctly green, heated or otherwise damaged

Representative portion for analysis

Minimum—5 g Optimum—10 g Export—10 g

Number of crushes (100-seed strips) for analysis

Minimum—5 Optimum—10 Export—10

Procedures

1. Handpick the representative portion to determine the content of visually damaged seeds.
2. Determine the percentage by weight.
3. Crush the appropriate number of strips from the portion remaining.
A crush is made with only one pass of the roller under firm pressure.
4. Convert the count of damaged seeds on the strip to percentage by weight. Add the percentage of visually damaged seeds and crushed seeds for *Total damage*.

Distinctly detrimental (DDET)

Admixtures considered distinctly detrimental include

- Cow cockle
- Sclerotinia

Representative portion for analysis

Minimum—5 g Optimum—50 g Export—5-50 g

Distinctly green (DGR)

Distinctly green tolerances are applied to crushed seeds which are a distinct green throughout. Pale green or immature seeds are taken into account in the evaluation of colour. See *Colour*.

Number of crushes (100-seed strips) for analysis

Minimum—5 Optimum—10 Export—10

Procedures

See *Damage*.

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure.
See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure.
See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Excreta (EXCR)

- ▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedures

- If the amount of excreta is not excessive, determine the kernel count.
 - If the kernel count is excessive, determine the weight of excreta as a percentage of the net weight of the sample.
-

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—1000 g

Optimum—1000 g

Export—1000 g

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are considered as a separate grading factor in all grades of domestic mustard seed.
 - Grades of domestic mustard seed may contain one fertilizer pellet in 1000 g, including samples of commercially clean mustard seed.
 - Samples containing one fertilizer pellet per 500 g up to 1.0% are graded *Domestic Mustard Seed, Sample Canada Brown Account Fertilizer Pellets*.
 - Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Domestic Mustard Seed, Held IP Suspect Contaminated Grain*.

Important: For samples between 500 and 1000 g – if the sample contains one fertilizer pellet, the sample grades *Domestic Mustard Seed, Sample Canada Brown Account Fertilizer Pellets*. If the sample contains no fertilizer pellets, it is considered to be within the grade tolerance.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspect Contaminated Grain, Handling Procedures*” for specific procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt kernels (FBNT)

Samples that show any evidence of being charred or scorched by fire are considered fireburnt. Evidence includes odour, pieces of charred wood, and so on. Fireburnt seeds pop when crushed.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedures

Samples considered fireburnt are graded *Domestic Mustard Seed, Sample Canada Brown Account Fireburnt*.

Frost

See *Damage*.

Green

See *Distinctly green*.

Heated kernels (HTD)

Heated refers only to seeds that are distinctly heated or badly binburnt. Heated seeds have a heated odour.

Crushed seeds may be

- Black—badly binburnt
- Dark chocolate brown—distinctly heated
- Light tan—slightly damaged from oxidation. If they have an odour or are present with brown or black crushed seeds, they are considered heated. Otherwise, they are included in *Total damage*, not heated.

Number of crushes (100-seed strips) for analysis

Minimum—5

Optimum—10

Export—10

Procedures

1. Examine 5 crushes for evidence of heating.
2. If no heated seeds detected, assess crushes for other damage. See *Damage*.
3. If at least 1 heated seed is detected, crush and assess an additional 5 crushes for heated seeds.

Inconspicuous admixture (INC ADMX)

In brown mustard seed, inconspicuous admixture includes

- Canola
- Common wild mustard seed
- Any other seeds that blend with brown mustard seed and are not readily identified

Representative portion for analysis

Minimum—5 g

Optimum—25 g

Export—5-25 g

- ▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.
-

Mixed classes (MXD CL)

Samples are designated mixed classes when they contain sufficient quantities of other classes of mustard seed. See *Other classes*.

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

| If odour is the grade determinant and there is . . . | Then the grade is . . . |
|--|--|
| A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt | <i>Domestic Mustard Seed, Sample Canada Brown, Account Odour</i> |
| A distinct heated odour | <i>Domestic Mustard Seed, Sample Canada Brown, Account Heated</i> |
| A distinct fireburnt odour | <i>Domestic Mustard Seed, Sample Canada Brown, Account Fireburnt</i> |

Other classes (OCL)

In brown mustard seed, other classes are yellow and oriental mustard seed.

If a sample contains more than 10.0% other classes, it is designated *Mixed*. Mixed mustard seed is graded according to all specifications except other classes, as in *Mustard Seed, No. 1 Canada Mixed*.

Representative portion for analysis

Minimum—2 g

Optimum—5 g

Export—2-5 g

Rime

Rime is the lining of the pod adhered to the seed. Seeds that are completely and densely covered with white rime are classed as damaged in any grade. Seeds with light rime sparsely covering the seed coat are

- Classed as sound if not otherwise damaged
- Considered in the evaluation of colour. See *Colour*.

Representative portion for analysis

Minimum—5 g

Optimum—10 g

Export—10 g

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a coarse surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only— if they do not crumble, they are considered *Stones*.
- Any non-toxic material of similar consistency

▲ **Important:** In domestic mustard seed, fertilizer pellets are not considered soft earth pellets. See *Fertilizer pellets*.

Representative portion for analysis

Minimum—100 g

Optimum—working
sample

Export—working
sample

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency.

Note: Fertilizer pellets are **not** assessed as stones in samples of Domestic Mustard Seed. See *Fertilizer pellets*.

Representative portion for analysis

Minimum—100 g

Optimum—working
sample

Export—working
sample

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.
 - In western Canada samples of grain containing stones in excess of “basic grade” tolerances, up to 2.5% are graded *Domestic Mustard Seed, Rejected “basic grade” Account Stones*. The “basic grade” refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
 - In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Domestic Mustard Seed, Sample Canada Brown Account Stones*.
 - In western and eastern Canada grain containing more than 2.5% stones is graded *Domestic Mustard Seed, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Domestic Mustard Seed, Brown, Canada

| Grade name | Stones % |
|--------------|-------------|
| No. 1 Canada | 0.05 |
| No. 2 Canada | 0.05 |
| No. 3 Canada | 0.05 |
| No. 4 Canada | 0.10 |

Basic grade:..... *Domestic Mustard Seed,
No. 2 Canada Brown*

Reason for basic grade:..... 2.0% Distinctly green

| If the above sample contained | Grade in western Canada |
|-------------------------------|--|
| 0.08% stones | <i>Domestic Mustard Seed, Rejected No. 2 Canada Brown Account Stones</i> |
| 1.0% stones | <i>Domestic Mustard Seed, Rejected No. 2 Canada Brown Account Stones</i> |
| 3.0% stones | <i>Domestic Mustard Seed, Sample Salvage</i> |

Examples: Eastern Canada

Excerpt from grade determinant tables for
Domestic Mustard Seed, Brown, Canada

| Grade name | Stones % |
|--------------|-------------|
| No. 1 Canada | 0.05 |
| No. 2 Canada | 0.05 |
| No. 3 Canada | 0.05 |
| No. 4 Canada | 0.10 |

Basic grade:..... *Domestic Mustard Seed,
No. 2 Canada Brown*

Reason for basic grade:..... 2.0% Distinctly green

| If the above sample contained | Grade in eastern Canada |
|-------------------------------|--|
| 0.08% stones | <i>Domestic Mustard Seed, No. 4 Canada Brown</i> |
| 1.0% stones | <i>Domestic Mustard Seed, Sample Canada Brown Account Stones</i> |
| 3.0% stones | <i>Domestic Mustard Seed, Sample Salvage</i> |

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals—pink or red, canola—baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

- ▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Domestic Mustard Seed, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspect Contaminated Grain, Handling Procedures*” for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Variety (VAR)

Domestic mustard seed is graded without reference to variety.

Wild mustard (WM)

Wild mustard seeds are classed as *Inconspicuous admixture*.

Representative portion for analysis

Minimum—5 g

Optimum—25 g

Export—5-25 g

- ▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Primary and export grade determinants tables

Domestic Mustard Seed, Brown, Canada (CAN)

| Grade name | Standard of quality | | Damage | | |
|-------------------------------|---|---|---|--|---|
| | Degree of soundness | Other classes % | Distinctly green % | Heated % | Total % |
| No. 1 Canada | Reasonably well matured, sweet, good natural colour | 0.5 | 1.5 | 0.10 | 1.5 |
| No. 2 Canada | Fairly well matured, sweet, reasonably good colour | 2 | 2.0 | 0.20 | 3 |
| No. 3 Canada | May have the natural odour associated with low-quality seed not any odour that would indicate serious deterioration | 5 | <u>3.5</u> | 0.5 | 5 |
| No. 4 Canada | May have the natural odour associated with low-quality seed not any odour that would indicate serious deterioration | 10 | <u>3.5</u> | 1 | 10 |
| Grade, if No. 4 specs not met | | Over 10%—use all other grading criteria and grade as <i>Domestic Mustard Seed (grade) Mixed</i> | <i>Domestic Mustard Seed, Sample Canada Brown Account Damaged</i> | <i>Domestic Mustard Seed, Sample Canada Brown Account Heated</i> | <i>Domestic Mustard Seed, Sample Canada Brown Account Damaged</i> |

| Grade name | Inconspicuous admixture % | Conspicuous inseparable seeds | | | | Ergot % | Excreta % | Soft earth pellets % | Stones % | |
|-------------------------------|---|-------------------------------|---------------|--------------------------------|---------|---|---|---|--|--|
| | | Distinctly detrimental | | | Total % | | | | | |
| | | Cow cockle % | Sclerotinia % | Total distinctly detrimental % | | | | | | |
| No. 1 Canada | 1.0 | 0.10 | 0.10 | 0.10 | 0.3 | 0.05 | 1 K | 0.01 | 0.05 | |
| No. 2 Canada | 1.0 | 0.20 | 0.20 | 0.20 | 0.5 | 0.05 | 1 K | 0.20 | 0.05 | |
| No. 3 Canada | 1.0 | 0.3 | 0.3 | 0.3 | 0.7 | 0.05 | 1 K | 0.3 | 0.05 | |
| No. 4 Canada | 1 | 1 | 1 | 1 | 3 | 0.05 | 0.005 | 1 | 0.1 | |
| Grade, if No. 4 specs not met | <i>Domestic Mustard Seed, Sample Canada Brown Account Admixture</i> | | | | | <i>Domestic Mustard Seed, Sample Canada Brown Account Ergot</i> | <i>Domestic Mustard Seed, Sample Canada Brown Account Excreta</i> | <i>Domestic Mustard Seed, Sample Canada Brown Account Admixture</i> | 2.5% or less— <i>Domestic Mustard Seed, Rejected (grade) Brown Account Stones, or Domestic Mustard Seed, Sample Canada Brown Account Stones</i> Over 2.5%— <i>Domestic Mustard Seed, Sample Salvage</i> | |

K Number of kernel-sized pieces in 500 g

Note: The class, whether yellow, oriental, brown or mixed, is added to the grade name.

Grading—Domestic Mustard Seed, Oriental

Representative portion of domestic mustard seed, oriental for grading, grams

| Grading factor | Minimum | Optimum | Export |
|--------------------------|----------------|----------------|----------------|
| Blotched seeds | 25 | 50 | 50 |
| Canola | 5 | 25 | 5-25 |
| Cockle | 5 | 50 | 5-50 |
| Colour | working sample | working sample | working sample |
| Conspicuous admixture | 5 | 50 | 5-50 |
| Damage | 5 | 10 | 10 |
| Distinctly detrimental | 5 | 50 | 5-50 |
| Distinctly green | 5 crushes | 10 crushes | 10 crushes |
| Ergot | 100 | 500 | 500 |
| Excreta | working sample | working sample | working sample |
| Fertilizer pellets | 1000 | 1000 | 1000 |
| Fireburnt | working sample | working sample | working sample |
| Heated | 5 crushes | 10 crushes | 10 crushes |
| Inconspicuous admixture | 5 | 25 | 5-25 |
| Odour | working sample | working sample | working sample |
| Other classes | 2 | 5 | 2-5 |
| Rime | 5 | 10 | 10 |
| Sclerotinia sclerotiorum | 100 | 500 | 500 |
| Soft earth pellets | 100 | working sample | working sample |
| Stones | 100 | working sample | working sample |
| Wild mustard seed | 5 | 25 | 5-25 |

Grading factors

Blotched seeds

Blotched seeds are oriental mustard seeds with black or brown discolourations on the seed coat.

- Seeds only partly discoloured but otherwise sound are considered sound, but the discolouration is taken into account in the evaluation of colour. See *Colour*.
- Seeds completely discoloured by blotch are considered damaged. See *Damage*.

Representative portion for analysis

Minimum—25 g

Optimum—50 g

Export—50 g

Canola (CNL)

In oriental mustard, canola is classed as *Inconspicuous admixture*.

- ▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Representative portion for analysis

Minimum—5 g

Optimum—25 g

Export—5-25 g

Classes

Domestic mustard seed is classed as yellow, brown or oriental, or mixed. The class forms part of the grade name; for example, *Domestic Mustard Seed*, *Sample Canada Oriental*, *Account Heated*. For a description of classes, see *Identifying classes of domestic mustard seed*.

Cockle (COC)

Cockle, or cow cockle, is a hard roundish seed with a dull surface covered with numerous small bumps giving the seed a rough spiky appearance. Colour can be deep black, bluish-black or orangish-brown. In oriental mustard, cockle is part of *Conspicuous admixture*.

Representative portion for analysis

Minimum—5 g

Optimum—50 g

Export—5-50 g

Procedures

Use a microscope to examine the sample.

Colour (CLR)

In analysing colour, consider

- The general degree of maturity
- The amount and degree of discolouration, such as from weathering
- The proportion of damaged seeds, which are distinctly green or otherwise colour-damaged. See *Damage* and *Distinctly green*.
- The amount of rime—light rime is considered in the overall appearance of the sample. See *Damage*.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Conspicuous admixture (CADMX)

Conspicuous admixture is called *Conspicuous inseparable seeds* in the grade determinants tables. In oriental mustard, conspicuous admixture includes

- Small seeds or broken seeds of other grains
- Weed seeds such as cow cockle, lamb's-quarters, ball mustard, pigweed, cleavers, smartweed and lady's-thumb.
- Any conspicuous foreign material except stones and soft earth pellets

Representative portion for analysis

Minimum—5 g

Optimum—50 g

Export—5-50 g

- ▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.
-

Contaminated grain

- ▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the “*Canada Grain Act*” as; “Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*.”

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Domestic Mustard Seed*, *Sample Canada Oriental Condemned*.

Damage (DMG)

Damaged seeds include those that are

- Distinctly shrunken or shrivelled
- Badly discoloured by mould
- Completely discoloured by blotch
- Completely and densely covered with rime
- Excessively weathered, sprouted, distinctly green, heated or otherwise damaged

Representative portion for analysis

Minimum—5 g Optimum—10 g Export—10 g

Number of crushes (100-seed strips) for analysis

Minimum—5 Optimum—10 Export—10

Procedures

1. Handpick the representative portion to determine the content of visually damaged seeds.
2. Determine the percentage by weight.
3. Crush the appropriate number of strips from the portion remaining.
A crush is made with only one pass of the roller under firm pressure.
4. Convert the count of damaged seeds on the strip to percentage by weight. Add the percentage of visually damaged seeds and crushed seeds for *Total damage*.

Distinctly detrimental (DDET)

Admixtures considered distinctly detrimental include

- Cow cockle
- Sclerotinia

Representative portion for analysis

Minimum—5 g Optimum—50 g Export—5-50 g

Distinctly green (DGR)

Distinctly green tolerances are applied to crushed seeds which are a distinct green throughout. Pale green or immature seeds are taken into account in the evaluation of colour. See *Colour*.

Number of crushes (100-seed strips) for analysis

Minimum—5 Optimum—10 Export—10

Procedures

See *Damage*.

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure.
See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure.
See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Excreta (EXCR)

- ▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedures

- If the amount of excreta is not excessive, determine the kernel count.
 - If the kernel count is excessive, determine the weight of excreta as a percentage of the net weight of the sample.
-

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—1000 g

Optimum—1000 g

Export—1000 g

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are considered as a separate grading factor in all grades of domestic mustard seed.
 - Grades of domestic mustard seed may contain one fertilizer pellet in 1000 g, including samples of commercially clean mustard seed.
 - Samples containing one fertilizer pellet per 500 g up to 1.0% are graded *Domestic Mustard Seed, Sample Canada Oriental Account Fertilizer Pellets*.
 - Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Domestic Mustard Seed, Held IP Suspect Contaminated Grain*.

Important: For samples between 500 and 1000 g – if the sample contains one fertilizer pellet, the sample grades *Domestic Mustard Seed, Sample Canada Oriental Account Fertilizer Pellets*. If the sample contains no fertilizer pellets, it is considered to be within the grade tolerance.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspect Contaminated Grain, Handling Procedures*” for specific procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt kernels (FBNT)

Samples that show any evidence of being charred or scorched by fire are considered fireburnt. Evidence includes odour, pieces of charred wood, and so on. Fireburnt seeds pop when crushed.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedures

Samples considered fireburnt are graded *Domestic Mustard Seed, Sample Canada* and *Oriental Account Fireburnt*.

Frost

See *Damage*.

Green

See *Distinctly green*.

Heated kernels (HTD)

Heated refers only to seeds that are distinctly heated or badly binburnt. Heated seeds have a heated odour.

Crushed seeds may be

- Black—badly binburnt
- Dark chocolate brown—distinctly heated
- Light tan—slightly damaged from oxidation. If they have an odour or are present with brown or black crushed seeds, they are considered heated. Otherwise, they are included in *Total damage*, not heated.

Number of crushes (100-seed strips) for analysis

Minimum—5

Optimum—10

Export—10

Procedures

1. Examine 5 crushes for evidence of heating.
2. If no heated seeds detected, assess crushes for other damage. See *Damage*.
3. If at least 1 heated seed is detected, crush and assess an additional 5 crushes for heated seeds.

Inconspicuous admixture (INC ADMX)

In oriental mustard seed, inconspicuous admixture includes

- Canola
- Common wild mustard seed
- Any other seeds that blend with oriental mustard seed and are not readily identified

Representative portion for analysis

Minimum—5 g

Optimum—25 g

Export—5-25 g

- ▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.
-

Mixed classes (MXD CL)

Samples are designated mixed classes when they contain sufficient quantities of other classes of mustard seed. See *Other classes*.

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

| If odour is the grade determinant and there is . . . | Then the grade is . . . |
|--|---|
| A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt | <i>Domestic Mustard Seed, Sample Canada Oriental, Account Odour</i> |
| A distinct heated odour | <i>Domestic Mustard Seed, Sample Canada Oriental, Account Heated</i> |
| A distinct fireburnt odour | <i>Domestic Mustard Seed, Sample Canada Oriental, Account Fireburnt</i> |

Other classes (OCL)

Other classes of domestic mustard seed in oriental mustard seed are yellow or brown.

If a sample contains more than 10.0% other classes, it is designated *Mixed*. Mixed mustard seed is graded according to all specifications except other classes, as in *Mustard Seed, No. 1 Canada Mixed*.

| Other class | Tolerance |
|-------------|--|
| Brown | Working tolerance for seeds with brown hulls <ul style="list-style-type: none">• For Canada No. 1 Oriental, 2.0%• For Canada No. 2, 3, 4 Oriental, 5.0% |
| Yellow | Considered <i>Mixed</i> if sample contains more than 10.0% of yellow mustard seed |

Representative portion for analysis

Minimum—2 g

Optimum—5 g

Export—2-5 g

Rime

Rime is the lining of the pod adhered to the seed. Seeds that are completely and densely covered with white rime are classed as damaged in any grade. Seeds with light rime sparsely covering the seed coat are

- Considered sound if not otherwise damaged
- Considered in the evaluation of colour. See *Colour*.

Representative portion for analysis

Minimum—5 g

Optimum—10 g

Export—10 g

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a coarse surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*.
- Any non-toxic material of similar consistency

▲ **Important:** In domestic mustard seed, fertilizer pellets are not considered soft earth pellets. See *Fertilizer pellets*.

Representative portion for analysis

Minimum—100 g

Optimum—working
sample

Export—working
sample

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency.

Note: Fertilizer pellets are **not** assessed as stones in samples of Domestic Mustard Seed. See *Fertilizer pellets*.

Representative portion for analysis

Minimum—100 g

Optimum—working
sample

Export—working
sample

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.
 - In western Canada samples of grain containing stones in excess of “basic grade” tolerances, up to 2.5% are graded *Domestic Mustard Seed, Rejected “basic grade” Account Stones*. The “basic grade” refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
 - In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Domestic Mustard Seed, Sample Canada Oriental Account Stones*.
 - In western and eastern Canada grain containing more than 2.5% stones is graded *Domestic Mustard Seed, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Domestic Mustard Seed, Oriental, Canada

| Grade name | Stones % |
|--------------|-------------|
| No. 1 Canada | 0.05 |
| No. 2 Canada | 0.05 |
| No. 3 Canada | 0.05 |
| No. 4 Canada | 0.10 |

Basic grade:..... *Domestic Mustard Seed,
No. 2 Canada Oriental*

Reason for basic grade:..... 2.0% Damage

| If the above sample contained | Grade in western Canada |
|----------------------------------|---|
| 0.08% stones | <i>Domestic Mustard Seed, Rejected No. 2 Canada Oriental Account Stones</i> |
| 1.0% stones | <i>Domestic Mustard Seed, Rejected No. 2 Canada Oriental Account Stones</i> |
| 3.0% stones | <i>Domestic Mustard Seed, Sample Salvage</i> |

Examples: Eastern Canada

Excerpt from grade determinant tables for
Domestic Mustard Seed, Oriental, Canada

| Grade name | Stones % |
|--------------|-------------|
| No. 1 Canada | 0.05 |
| No. 2 Canada | 0.05 |
| No. 3 Canada | 0.05 |
| No. 4 Canada | 0.10 |

Basic grade:..... *Domestic Mustard Seed,
No. 2 Canada Oriental*

Reason for basic grade:..... 2.0% Damage

| If the above sample contained | Grade in eastern Canada |
|----------------------------------|---|
| 0.08% stones | <i>Domestic Mustard Seed, No. 4 Canada Oriental</i> |
| 1.0% stones | <i>Domestic Mustard Seed, Sample Canada Oriental Account Stones</i> |
| 3.0% stones | <i>Domestic Mustard Seed, Sample Salvage</i> |

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals—pink or red, canola—baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

- ▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

| | | |
|---------------------------|---------------------------|--------------------------|
| Minimum—working sample | Optimum—working sample | Export—working sample |
|---------------------------|---------------------------|--------------------------|

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Domestic Mustard Seed, Sample Canada Oriental Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspect Contaminated Grain, Handling Procedures*” for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Variety (VAR)

Domestic mustard seed is graded without reference to variety.

Wild mustard (WM)

Wild mustard seeds are classed as *Inconspicuous admixture*.

Representative portion for analysis

| | | |
|-------------|--------------|---------------|
| Minimum—5 g | Optimum—25 g | Export—5-25 g |
|-------------|--------------|---------------|

- ▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Primary and export grade determinants tables

Domestic Mustard Seed, Oriental, Canada (CAN)

| Grade name | Standard of quality | | Damage | | |
|-------------------------------|---|---|--|---|--|
| | Degree of soundness | Other classes % | Distinctly green % | Heated % | Total % |
| No. 1 Canada | Reasonably well matured, sweet, good natural colour | 0.5 | 1.5 | 0.10 | 1.5 |
| No. 2 Canada | Fairly well matured, sweet, reasonably good colour | 2 | 1.5 | 0.20 | 3 |
| No. 3 Canada | May have the natural odour associated with low-quality seed not any odour that would indicate serious deterioration | 5 | <u>3.5</u> | 0.5 | 5 |
| No. 4 Canada | May have the natural odour associated with low-quality seed not any odour that would indicate serious deterioration | 10 | <u>3.5</u> | 1 | 10 |
| Grade, if No. 4 specs not met | | Over 10%—use all other grading criteria and grade as <i>Domestic Mustard Seed (grade) Mixed</i> | <i>Domestic Mustard Seed, Sample Canada Oriental Account Damaged</i> | <i>Domestic Mustard Seed, Sample Canada Oriental Account Heated</i> | <i>Domestic Mustard Seed, Sample Canada Oriental Account Damaged</i> |

| Grade name | Inconspicuous admixture % | Conspicuous inseparable seeds | | | | Ergot % | Excreta % | Soft earth pellets % | Stones % | |
|-------------------------------|--|-------------------------------|---------------|--------------------------------|---------|--|--|--|--|--|
| | | Distinctly detrimental | | | Total % | | | | | |
| | | Cow cockle % | Sclerotinia % | Total distinctly detrimental % | | | | | | |
| No. 1 Canada | 0.5 | 0.10 | 0.10 | 0.10 | 0.3 | 0.05 | 1 K | 0.01 | 0.05 | |
| No. 2 Canada | 1.0 | 0.20 | 0.20 | 0.20 | 0.5 | 0.05 | 1 K | 0.20 | 0.05 | |
| No. 3 Canada | 1.0 | 0.3 | 0.3 | 0.3 | 0.7 | 0.05 | 1 K | 0.3 | 0.05 | |
| No. 4 Canada | 1 | 1 | 1 | 1 | 3 | 0.05 | 0.005 | 1 | 0.1 | |
| Grade, if No. 4 specs not met | <i>Domestic Mustard Seed, Sample Canada Oriental Account Admixture</i> | | | | | <i>Domestic Mustard Seed, Sample Canada Oriental Account Ergot</i> | <i>Domestic Mustard Seed, Sample Canada Oriental Account Excreta</i> | <i>Domestic Mustard Seed, Sample Canada Oriental Account Admixture</i> | <i>2.5% or less—Domestic Mustard Seed, Rejected (grade) Oriental Account Stones, or Domestic Mustard Seed, Sample Canada Oriental Account Stones</i> <i>Over 2.5%—Domestic Mustard Seed, Sample Salvage</i> | |

K Number of kernel-sized pieces in 500 g

Note: The class, whether yellow, oriental, brown or mixed, is added to the grade name.

Grading—Domestic Mustard Seed, Yellow

Representative portion of domestic mustard seed, yellow for grading, grams

| Grading factor | Minimum | Optimum | Export |
|------------------------------------|----------------|----------------|----------------|
| Canola | 5 | 25 | 5-25 |
| Cockle | 5 | 50 | 5-50 |
| Colour | working sample | working sample | working sample |
| Conspicuous admixture | 5 | 50 | 5-50 |
| Damage | 5 | 10 | 10 |
| Distinctly detrimental | 5 | 50 | 5-50 |
| Distinctly green | 5 crushes | 10 crushes | 10 crushes |
| Ergot | 100 | 500 | 500 |
| Excreta | working sample | working sample | working sample |
| Fertilizer pellets | 1000 | 1000 | 1000 |
| Fireburnt | working sample | working sample | working sample |
| Heated | 5 crushes | 10 crushes | 10 crushes |
| Odour | working sample | working sample | working sample |
| Other classes | 2 | 5 | 2-5 |
| Other distinctly detrimental seeds | 5 | 50 | 5-25 |
| Rime | 5 | 10 | 10 |
| Sclerotinia sclerotiorum | 100 | 500 | 500 |
| Soft earth pellets | 100 | working sample | working sample |
| Stones | 100 | working sample | working sample |
| Wild mustard seed | 5 | 25 | 5-25 |

Grading factors

Canola (CNL)

In yellow mustard seed, canola is classed as *Distinctly detrimental*.

- ▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Representative portion for analysis

Minimum—5 g

Optimum—25 g

Export—5-25 g

Classes

Domestic mustard seed is classed as yellow, brown or oriental, or mixed. The class forms part of the grade name; for example, *Domestic Mustard Seed, Sample Canada Yellow, Account Heated*. For a description of classes, see *Identifying classes of domestic mustard seed*

Cockle (COC)

Cockle, or cow cockle, is a hard roundish seed with a dull surface covered with numerous small bumps giving the seed a rough spiky appearance. Colour can be deep black, bluish-black or orangish-brown. In yellow mustard seed, cockle is considered *Distinctly detrimental* and included in *Total conspicuous inseparable seeds*.

Representative portion for analysis

Minimum—5 g

Optimum—50 g

Export—5-50 g

Procedures

Use a microscope to examine the sample.

Colour (CLR)

In analysing colour, consider

- The general degree of maturity
- The amount and degree of discolouration, such as from weathering
- The proportion of damaged seeds, which are distinctly green or otherwise colour-damaged. See *Damage* and *Distinctly green*.
- The amount of dried white mucilage on yellow mustard seed—light or sparse mucilage is considered in the overall appearance of the sample. See *Damage*.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Conspicuous admixture (CADMX)

Conspicuous admixture is called *Conspicuous inseparable seeds* in the grade determinants tables. In yellow mustard seed, conspicuous admixture includes

- Seeds and foreign material designated as distinctly detrimental. See *Distinctly detrimental*
- Small seeds and broken kernels of other grains
- Weed seeds such as pigweed, lady's-thumb, lamb's-quarters and smartweed
- Any conspicuous foreign material except stones and soft earth pellets

Representative portion for analysis

Minimum—5 g

Optimum—50 g

Export—5-50 g

- ▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Contaminated grain

- ▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the “*Canada Grain Act*” as; “Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*.”

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Domestic Mustard Seed, Sample Canada Yellow Condemned*.

Damage (DMG)

Damaged seeds include those that are

- Distinctly shrunken or shrivelled
- Badly discoloured from mould
- Completely and densely covered with rime or dried white mucilage. See *Colour*.
- Excessively weathered, sprouted, distinctly green, heated or otherwise damaged

Representative portion for analysis

Minimum—5 g Optimum—10 g Export—10 g

Number of crushes (100-seed strips) for analysis

Minimum—5 Optimum—10 Export—10

Procedures

1. Handpick the representative portion to determine the content of visually damaged seeds.
2. Determine the percentage by weight.
3. Crush the appropriate number of strips from the portion remaining.
A crush is made with only one pass of the roller under firm pressure.
4. Convert the count of damaged seeds on the strip to percentage by weight. Add this percentage of visually damaged seeds and crushed seeds for *Total damage*.

Distinctly detrimental (DDET)

Admixtures considered distinctly detrimental in yellow mustard seed include

- Cow cockle
- Sclerotinia
- Wild mustard, canola/rapeseed
- Other distinctly detrimental seeds (see *Other distinctly detrimental seeds*)
 - Ball mustard Stinkweed or pennycress
 - Cleavers Tansy mustard
 - Cockle Tumbling mustard
 - Dog mustard Wild buckwheat
 - Hare's ear mustard Wormseed mustard

There are separate distinctly detrimental tolerances for cow cockle, sclerotinia and wild mustard in combination with canola or rapeseed and other distinctly detrimental seeds. All listed are included in the total of distinctly detrimental and total of conspicuous inseparable seeds.

Representative portion for analysis

Minimum—5 g Optimum—50 g Export—5-50 g

Distinctly green (DGR)

Distinctly green tolerances are applied to crushed seeds which are a distinct green throughout. Pale green or immature seeds are taken into account in the evaluation of colour. See *Colour*.

Number of crushes (100-seed strips) for analysis

Minimum—5

Optimum—10

Export—10

Procedures

See *Damage*.

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure. See *Stones*.
 - Soft earth pellets are pellets that crumble under light pressure. See *Soft earth pellets*.
-

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Excreta (EXCR)

- ▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedures

- If the amount of excreta is not excessive, determine the kernel count.
- If the kernel count is excessive, determine the weight of excreta as a percentage of the net weight of the sample.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—1000 g

Optimum—1000 g

Export—1000 g

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are considered as a separate grading factor in all grades of domestic mustard seed.
 - Grades of domestic mustard seed may contain one fertilizer pellet in 1000 g, including samples of commercially clean mustard seed.
 - Samples containing one fertilizer pellet per 500 g up to 1.0% are graded *Domestic Mustard Seed, Sample Canada Yellow Account Fertilizer Pellets*.
 - Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Domestic Mustard Seed, Held IP Suspect Contaminated Grain*.

Important: For samples between 500 and 1000 g – if the sample contains one fertilizer pellet, the sample grades *Domestic Mustard Seed, Sample Canada Yellow Account Fertilizer Pellets*. If the sample contains no fertilizer pellets, it is considered to be within the grade tolerance.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspect Contaminated Grain, Handling Procedures*” for specific procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt kernels (FBNT)

Samples that show any evidence of being charred or scorched by fire are considered fireburnt. Evidence includes odour, pieces of charred wood, and so on. Fireburnt seeds pop when crushed.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedures

Samples considered fireburnt are graded *Domestic Mustard Seed, Sample Canada Yellow Account Fireburnt*.

Frost

See *Damage*.

Green

See *Distinctly green*.

Heated kernels (HTD)

Heated refers only to seeds that are distinctly heated or badly binburnt. Heated seeds have a heated odour.

Crushed seeds may be

- Black—badly binburnt
- Dark chocolate brown—distinctly heated
- Light tan—slightly damaged from oxidation. If they have an odour or are present with brown or black crushed seeds, they are considered heated. Otherwise, they are included in *Total damage*, not heated.

Number of crushes (100-seed strips) for analysis

Minimum—5

Optimum—10

Export—10

Procedures

1. Examine 5 crushes for evidence of heating.
2. If no heated seeds detected, assess crushes for other damage. See *Damage*.
3. If at least 1 heated seed is detected, crush and assess an additional 5 crushes for heated seeds.

Mixed classes (MXD CL)

Samples are designated mixed classes when they contain sufficient quantities of other classes of mustard seed. See *Other classes*.

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working
Sample

Optimum—working
sample

Export—working
sample

| If odour is the grade determinant and there is . . . | Then the grade is . . . |
|--|---|
| A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt | <i>Domestic Mustard Seed, Sample Canada Yellow, Account Odour</i> |
| A distinct heated odour | <i>Domestic Mustard Seed, Sample Canada Yellow, Account Heated</i> |
| A distinct fireburnt odour | <i>Domestic Mustard Seed, Sample Canada Yellow, Account Fireburnt</i> |

Other classes (OCL)

Other classes of domestic mustard seed in yellow mustard seed are brown and oriental mustard seed.

If a sample contains more than 10.0% other classes, it is designated *Mixed*. Mixed mustard seed is graded according to all specifications except other classes, as in *Mustard seed, No. 1 Canada Mixed*.

Representative portion for analysis

Minimum—2 g

Optimum—5 g

Export—2-5 g

Other distinctly detrimental seeds (ODDET)

In yellow domestic mustard seed, the seeds listed below are considered *Other distinctly detrimental seeds*.

Ball mustard

Stinkweed or pennycress

Cleavers

Tansy mustard

Cockle

Tumbling mustard

Dog mustard

Wild buckwheat

Hare's ear mustard

Wormseed mustard

- ▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analysis are confirmed by seed analysts.

Representative portion for analysis

Minimum—5 g

Optimum—25 g

Export—5-25 g

Rime

Rime is the lining of the pod adhered to the seed. Seeds that are completely and densely covered with white rime are classed as damaged in any grade. Seeds with light rime sparsely covering the seed coat are

- Classed as sound if not otherwise damaged
- Considered in the evaluation of colour. See *Colour*.

Representative portion for analysis

Minimum—5 g

Optimum—10 g

Export—10 g

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a coarse surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Soft earth pellets (EP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*.
- Any non-toxic material of similar consistency

▲ **Important:** In domestic mustard seed, fertilizer pellets are not considered soft earth pellets. See *Fertilizer pellets*.

Representative portion for analysis

Minimum—100 g

Optimum—working
sample

Export—working
sample

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency.

Note: Fertilizer pellets are **not** assessed as stones in samples of Domestic Mustard Seed. See *Fertilizer pellets*.

Representative portion for analysis

Minimum—100 g

Optimum—working
sample

Export—working
sample

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.
 - In western Canada samples of grain containing stones in excess of “basic grade” tolerances, up to 2.5% are graded *Domestic Mustard Seed, Rejected “basic grade” Account Stones*. The “basic grade” refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
 - In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Domestic Mustard Seed, Sample Canada Yellow Account Stones*.
 - In western and eastern Canada grain containing more than 2.5% stones is graded *Domestic Mustard Seed, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Domestic Mustard Seed, Yellow, Canada

| Grade name | Stones % |
|--------------|-------------|
| No. 1 Canada | 0.05 |
| No. 2 Canada | 0.05 |
| No. 3 Canada | 0.05 |
| No. 4 Canada | 0.10 |

Basic grade:..... *Domestic Mustard Seed,
No. 2 Canada Yellow*

Reason for basic grade:..... 2.0% Heated

| If the above sample contained | Grade in western Canada |
|----------------------------------|---|
| 0.08% stones | <i>Domestic Mustard Seed, Rejected No. 2 Canada Yellow Account Stones</i> |
| 1.0% stones | <i>Domestic Mustard Seed, Rejected No. 2 Canada Yellow Account Stones</i> |
| 3.0% stones | <i>Domestic Mustard Seed, Sample Salvage</i> |

Examples: Eastern Canada

Excerpt from grade determinant tables for
Domestic Mustard Seed, Yellow, Canada

| Grade name | Stones % |
|--------------|-------------|
| No. 1 Canada | 0.05 |
| No. 2 Canada | 0.05 |
| No. 3 Canada | 0.05 |
| No. 4 Canada | 0.10 |

Basic grade:..... *Domestic Mustard Seed,
No. 2 Canada Yellow*

Reason for basic grade:..... 2.0% Heated

| If the above sample contained | Grade in western Canada |
|----------------------------------|---|
| 0.08% stones | <i>Domestic Mustard Seed No. 4 Canada Yellow</i> |
| 1.0% stones | <i>Domestic Mustard Seed, Sample Canada Yellow Account Stones</i> |
| 3.0% stones | <i>Domestic Mustard Seed, Sample Salvage</i> |

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals—pink or red, canola—baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

- ▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

| | | |
|---------------------------|---------------------------|--------------------------|
| Minimum—working sample | Optimum—working sample | Export—working sample |
|---------------------------|---------------------------|--------------------------|

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Domestic Mustard Seed, Sample Canada Yellow Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspect Contaminated Grain, Handling Procedures*” for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Variety (VAR)

Domestic mustard seed is graded without reference to variety.

Wild mustard (WM)

In yellow mustard, wild mustard seeds are classed as *Distinctly detrimental*.

Representative portion for analysis

| | | |
|-------------|--------------|---------------|
| Minimum—5 g | Optimum—25 g | Export—5-25 g |
|-------------|--------------|---------------|

- ▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Primary and export grade determinants tables

Domestic Mustard Seed, Yellow, Canada (CAN)

| Grade name | Standard of quality | | Damage | | |
|-------------------------------|---|---|--|---|--|
| | Degree of soundness | Other classes % | Distinctly green % | Heated % | Total % |
| No. 1 Canada | Reasonably well matured, sweet, good natural colour | 0.5 | 1.5 | 0.10 | 1.5 |
| No. 2 Canada | Fairly well matured, sweet, reasonably good colour | 2 | 1.5 | 0.20 | 3 |
| No. 3 Canada | May have the natural odour associated with low-quality seed not any odour that would indicate serious deterioration | 5 | <u>3.5</u> | 0.5 | 5 |
| No. 4 Canada | May have the natural odour associated with low-quality seed not any odour that would indicate serious deterioration | 10 | <u>3.5</u> | 1 | 10 |
| Grade, if No. 4 specs not met | | Over 10%—use all other grading criteria and grade as <i>Domestic Mustard Seed (grade) Mixed</i> | <i>Domestic Mustard Seed, Sample Canada Yellow Account Damaged</i> | <i>Domestic Mustard Seed, Sample Canada Yellow Account Heated</i> | <i>Domestic Mustard Seed, Sample Canada Yellow Account Damaged</i> |

| Grade name | Conspicuous inseparable seeds | | | | | | Ergot % | Excreta % | Soft earth pellets % | Stones % | |
|-------------------------------|--|---------------|----------------------------------|--------------------------------|--------------------------------|---------|--|--|--|--|--|
| | Distinctly detrimental | | | | | Total % | | | | | |
| | Cow cockle % | Sclerotinia % | Wild mustard, canola/ rapeseed % | Other distinctly detrimental % | Total distinctly detrimental % | | | | | | |
| No. 1 Canada | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.3 | 0.05 | 1 K | 0.01 | 0.05 | |
| No. 2 Canada | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.5 | 0.05 | 1 K | 0.20 | 0.05 | |
| No. 3 Canada | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.7 | 0.05 | 1 K | 0.3 | 0.05 | |
| No. 4 Canada | 1 | 1 | 1 | 1 | 1 | 3 | 0.05 | 0.005 | 1 | 0.1 | |
| Grade, if No. 4 specs not met | <i>Domestic Mustard Seed, Sample Canada Yellow Account Admixture</i> | | | | | | <i>Domestic Mustard Seed, Sample Canada Yellow Account Ergot</i> | <i>Domestic Mustard Seed, Sample Canada Yellow Account Excreta</i> | <i>Domestic Mustard Seed, Sample Canada Yellow Account Admixture</i> | <i>2.5% or less—Domestic Mustard Seed, Rejected (grade) Yellow Account Stones, or Domestic Mustard Seed, Sample Canada Yellow Account Stones</i> <i>Over 2.5%—Domestic Mustard Seed, Sample Salvage</i> | |

K Number of kernel-sized pieces in 500 g

Note: The class, whether yellow, oriental, brown or mixed, is added to the grade name

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments defined as commercially clean when the net dockage does not exceed 2.5% of the sample weight.

Dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

A deduction for broken and reasonably sound mustard seed handpicked from the material and removed as dockage is allowed

- On shipments not for direct export, of up to 0.50%
- On shipments for direct export, of up to 0.75%

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are allowed only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

Instead of the allowances for broken seed in commercially clean shipments, a direct deduction of up to 0.2% is applied to establish net dockage.

Determination of dockage

Follow procedures for normal cleaning, with the Carter dockage tester set up as follows. You also need the No. .028 and No. .032 slotted hand sieves.

| Setting | Export |
|-----------------------|------------|
| Feed control | #3 |
| Air control | #5 |
| Riddle | No. 000 |
| Top sieve | Blank tray |
| Centre sieve | None |
| Bottom sieve | None |
| Sieve cleaner control | Off |

Composition of dockage

In export domestic mustard seed shipments, dockage consists of

- Material other than mustard which passes over the No. 000 riddle or remains on top of the round-hole sieve
- Material that passes through the No. .028 or No. .032 slotted hand sieve, less the applicable allowance for broken or reasonably sound small whole mustard seed
- Material removed by aspiration

Grading

Domestic mustard seed on export is graded in accordance with export specifications. Where there are no export specifications, the primary specifications are used.