



Official Grain Grading Guide

August 1, 2011

Regional offices

Western RegionPhone: 604-666-2028.....Fax: 604-666-8703
Central Region.....Phone: 807-626-1401Fax: 807-623-8701
Eastern Region.....Phone: 514-283-7426.....Fax: 514-283-7699

Service centers

CalgaryPhone: 403-292-4211Fax: 403-292-5075
SaskatoonPhone: 306-975-5714Fax: 306-975-4258
WeyburnPhone: 306-848-3350.....Fax: 306-848-3353
Winnipeg.....Phone: 204-983-2790.....Fax: 204-984-5131

Quality • Service • Innovation

9. Mixed grain

Determination of commercially clean	9-2
Determination of dockage.....	9-3
Definitions	9-3
Dockage not reported	9-3
Composition of mixed grain	9-3
Normal cleaning procedures.....	9-3
Composition of dockage	9-4
Cleaning for grade improvement	9-4
Optional analysis	9-5
Grading	9-6
Important definitions	9-6
Net weight of sample	9-6
Hazardous substances in samples	9-6
Representative portion for grading	9-6
Grading factors	9-7
Broken (BKN)	9-7
Contaminated grain	9-7
Earth pellets (EP)	9-7
Ergot (ERG).....	9-7
Excreta (EXCR)	9-7
Fertilizer pellets (FERT PLTS)	9-8
Fireburnt (FBNT)	9-8
Heated (HTD)	9-8
Large seeds (LSDS)	9-8
Odour (HTD).....	9-9
Sclerotinia sclerotiorum (SCL)	9-9
Soft earth pellets (SEP)	9-9
Stones (STNS)	9-10
Treated seed and other chemical substances	9-12
Primary grade determinants tables.....	9-13
Mixed Grain, Canada Western (CW).....	9-13
Mixed Grain, Canada Eastern (CE).....	9-14
Export shipments.....	9-15
Commercially clean	9-15
Not commercially clean (NCC)	9-15
Grading.....	9-15
Export grade determinants tables.....	9-16
Mixed Grain, Canada Western/Canada Eastern (CW/CE)	9-16

Determination of commercially clean

Dockage is not assessed on mixed grain samples that meet the commercially clean specifications defined in the mixed grain export grade determinant table. All samples must be analyzed to determine if they are commercially clean prior to dockage assessment. The analysis of samples which are **clearly** not commercially clean may consist of a visual assessment. For example, if there is no doubt that a sample contains more than 0.1% of small seeds without hand sieving and weighing the seeds then dockage will be assessed using procedures defined under *Determination of dockage*. Where there is any doubt regarding whether the sample is commercially clean the sample must be analyzed using the procedures outlined in steps 1 through 5 below to confirm that the sample is not commercially clean prior to assessing a dockage.

1. Using a Boerner-type divider, divide the sample to obtain a representative portion.
 - Official samples should be at least 900 grams.
 - Unofficial samples must be at least 750 grams.
2. Place approximately 250 grams of the sample at a time on the No. 4.5 round-hole hand sieve.
3. Move the sieves from left to right 30 times using a sifting motion. One complete motion is approximately 10 cm from the center to one side, back to the center, approximately 10 cm to the other side and back to the center.
4. All material passing through the No. 4.5 round-hole sieve is weighed and the percentage calculated to determine if it meets the commercially clean specification of the grade for material removable through the No. 4.5 round hole sieve. (Column #2 in the mixed grain export grade determinant table)
5. Small seeds passing through the No. 4.5 round hole sieve are weighed and the percentage calculated to determine if they meet the commercially clean specification of the grade for small seeds. (Column #1 in the mixed grain export grade determinant table)

Should the percentage concentration of either of the factors determined in steps 1 through 5 exceed the specifications set out in columns 1 or 2 of the mixed grain export grade determinant table the sample will be considered to be not commercial clean. Dockage will be assessed on samples determined to be not commercially clean by using the procedures defined under *Determination of dockage*.

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 section of the guide.

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 the cleaning assessment has been completed.

Dockage not reported

- ▲ **Important:** Dockage is not reported for samples grading
 - Mixed Grain, Sample CW/CE Account Fireburnt
 - Mixed Grain, Sample Salvage
 - Mixed Grain, Sample Condemned

Composition of mixed grain

Mixed grain consists of any mixture of wheat, rye, barley, oats, triticale, wild oats and domestic or wild oat groats which is excluded from other established grades on account of such mixtures.

- ▲ **Important:** When a sample is to be graded as mixed grain, return dockage to the cleaned sample, and begin *Normal cleaning procedures* described in this section.

Normal cleaning procedures

1. Set up the Carter dockage tester as follows:

Feed control	6
Air control	Minimum 4
Riddle	No. 6
Top sieve	No. 6 buckwheat
Centre sieve	No. 5 buckwheat
Bottom sieve	No. 4.5 round-hole
Sieve cleaner control	Off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
 - Official samples should be at least 900 grams.
 - Unofficial samples should be at least 750 grams.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. After the sample has passed through the machine, turn on the sieve cleaner control for two to three seconds to remove kernels lodged in the sieve.
6. Turn off the dockage tester.
7. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.
8. Remove the aspiration pan.
9. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- Material handpicked or removed over the No. 6 riddle
- Lightweight material removed by aspiration
- Material that passes through the No. 4.5 round-hole sieve
- Material such as large seeds removed by the No. 5 buckwheat sieve in excess of the grade tolerance for total foreign material
- A maximum of 10% of soft earth pellets handpicked from the clean sample
- Material removed by *Cleaning for grade improvement*

Cleaning for grade improvement

If the grade of a sample 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 the cleaning assessment has been completed.

1. After the cleaning assessment has been completed, sieve the sample, using the No. 6 buckwheat hand sieve.
 - ▲ **Important:** 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, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.
2. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement

Material to be removed	Equipment	Effect on composition of dockage
Large seeds	No. 6 buckwheat hand sieve	Large seeds are seeds that pass through the No. 6 buckwheat sieve. Add them to dockage.
Stones	No. 6 buckwheat hand sieve	Add all stones that pass through the No. 6 buckwheat sieve to dockage.

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 mixed grain.
 - 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% Mixed Grain CW Wheat

4.0% Domestic Mustard Seed, No. 1 CAN Oriental

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.

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, desiccant or inoculant.”

Representative portion for grading

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

Values in the following table represent a range of recommended portions of samples for grading. Refer to definition of “Representative portion” in the glossary for a complete description of the terms “Minimum”, “Optimum” and “Export”.

Representative portion of mixed grain for grading, grams

Grading factor	Minimum	Optimum	Export
Broken	25	50	50
Ergot	500	1000	1000
Excreta	working sample	working sample	working sample
Fireburnt	500	working sample	working sample
Fusarium damage	25	100	100
Heated	25	100	100
Large seeds	100	250	working sample
Sclerotinia sclerotiorum	500	1000	1000
Soft earth pellets	working sample	working sample	working sample
Stones	500	1000	1000

Grading factors

Broken (BKN)

Broken kernels are pieces of grain that are less than three-quarters of a whole kernel.

Representative portion for analysis

Minimum—25 g

Optimum—50 g

Export—50 g

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 *Mixed Grain, Sample Condemned*.

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 having a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

Procedures

- Determine the weight of ergot as a percentage of the net weight of the sample.
-

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

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—working
sample

Optimum—working
sample

Export—working
sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Mixed Grain, Held IP Suspect Contaminated Grain*.

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

Fireburnt (FBNT)

Fireburnt kernels are kernels charred or scorched by fire. A cross-section of a fireburnt kernel resembles charcoal with numerous air holes. The air holes result in a low weight kernel which crumbles easily under pressure.

Representative portion for analysis

Minimum—500 g

Optimum—working
sample

Export—working
sample

Heated (HTD)

Heated kernels are kernels having the colour and odour typical of grain that has heated in storage or has been damaged by artificial drying, but not charred kernels. Heated kernels include all heated grains in the sample.

Representative portion for analysis

Minimum—25 g

Optimum—100 g

Export—100 g

Large seeds (LSDS)

Large seeds are seeds that do not pass through the No. 4.5 round-hole sieve and grains other than cereal grains, such as peas, beans, corn, flaxseed and domestic buckwheat. Large seeds remaining in the sample are included in *Total foreign material*.

Representative portion for analysis

Minimum—100 g

Optimum—250 g

Export—working
sample

Odour (HTD)

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>Mixed grain, Sample CW/CE, Account Odour</i>
A distinct heated odour	<i>Mixed grain, Sample CW/CE, Account Heated</i>
A distinct fireburnt odour	<i>Mixed grain, Sample CW/CE, Account Fireburnt</i>

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 course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 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

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedures

1. Handpick soft earth pellets from a representative portion of the cleaned sample.
2. Soft earth pellets constituting 10.0% or less of the sample are assessed as dockage.
3. Where soft earth pellets represent more than 10% of the net weight, the sample is graded *Mixed Grain, Sample CW/CE Account Admixture*.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

Note: Stones may be removed and included in dockage if the material removed is 5.0% or less of the gross weight of the sample. See *Cleaning for grade improvement*.

- In western Canada samples of grain containing stones in excess of “basic grade” tolerances, up to 2.5% are graded *Mixed Grain, 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 *Mixed Grain, Sample CE Account Stones*.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Mixed Grain, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Mixed Grain, Canada Western (CW)

Grade name	Stones %
Mixed Grain CW Wheat	0.1
Mixed Grain CW Rye	0.1
Mixed Grain CW Barley	0.1
Mixed Grain CW Oats	0.1
Mixed Grain CW Triticale	0.1
Mixed Grain CW	0.1

Basic grade:..... *Mixed Grain, CW Wheat*

If the above sample contained	Grade in western Canada
0.2% stones	<i>Mixed Grain, Rejected CW Wheat Account Stones</i>
1.0% stones	<i>Mixed Grain, Rejected CW Wheat Account Stones</i>
3.0% stones	<i>Mixed Grain, Sample Salvage</i>

Examples: Eastern Canada

Excerpt from grade determinant tables for
Mixed Grain, Canada Eastern (CE)

Grade name	Stones %
Mixed Grain CE Wheat	0.1
Mixed Grain CE Rye	0.1
Mixed Grain CE Barley	0.1
Mixed Grain CE Oats	0.1
Mixed Grain CE Triticale	0.1
Mixed Grain CE	0.1

Basic grade:..... *Mixed Grain, CE Wheat*

If the above sample contained	Grade in eastern Canada
0.2% stones	<i>Mixed Grain, Sample CE Account Stones</i>
1.0% stones	<i>Mixed Grain, Sample CE Account Stones</i>
3.0% stones	<i>Mixed Grain, 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 *Mixed grain, 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.

Primary grade determinants tables

Mixed Grain, Canada Western (CW)

Grade name	** Composition
Mixed Grain CW Wheat	Mixtures of cereal grains and wild oats, containing greater than 50% wheat
Mixed Grain CW Rye	Mixtures of cereal grains and wild oats, containing greater than 50% rye
Mixed Grain CW Barley	Mixtures of cereal grains and wild oats, containing greater than 50% barley
Mixed Grain CW Oats	Mixtures of cereal grains and wild oats, containing greater than 50% oats
Mixed Grain CW Triticale	Mixtures of cereal grains and wild oats, containing greater than 50% triticale
Mixed Grain CW	Mixtures of cereal grains and wild oats, no single cereal grain exceeding 50% but containing 50% or greater of total cereal grains

Grade name	Damage			Foreign material				Total %
	Broken %	Fireburnt %	Heated %	Ergot %	Excreta %	Sclerotinia %	Stones %	
Mixed Grain CW Wheat	20	0.5	10	0.1	0.02	<u>0.25</u>	0.1	2
Mixed Grain CW Rye	20	0.5	10	0.1	0.02	<u>0.25</u>	0.1	2
Mixed Grain CW Barley	20	0.5	10	0.1	0.02	<u>0.25</u>	0.1	2
Mixed Grain CW Oats	20	0.5	10	0.1	0.02	<u>0.25</u>	0.1	2
Mixed Grain CW Triticale	20	0.5	10	0.1	0.02	<u>0.25</u>	0.1	2
Mixed Grain CW	20	0.5	10	0.1	0.02	<u>0.25</u>	0.1	2
Grade, if specs for Mixed Grain not met	50% or less– Sample Feed Grain Over 50%– Sample Broken Grain	Mixed Grain, Sample CW Account Fireburnt	Mixed Grain, Sample CW Account Heated	Mixed Grain, Sample CW Account Ergot	Mixed Grain, Sample CW Account Excreta	Mixed Grain, Sample CW Account Admixture	2.5% or less– Mixed Grain, Rejected (grade) Account Stones Over 2.5%– Mixed Grain, Sample Salvage	Mixed Grain, Sample CW Account Admixture

** All grades must have less than 50% by weight of wild oats

Mixed Grain, Canada Eastern (CE)

Grade name	** Composition
Mixed Grain CE Wheat	Mixtures of cereal grains and wild oats, containing greater than 50% wheat
Mixed Grain CE Rye	Mixtures of cereal grains and wild oats, containing greater than 50% rye
Mixed Grain CE Barley	Mixtures of cereal grains and wild oats, containing greater than 50% barley
Mixed Grain CE Oats	Mixtures of cereal grains and wild oats, containing greater than 50% oats
Mixed Grain CE Triticale	Mixtures of cereal grains and wild oats, containing greater than 50% triticale
Mixed Grain CE	Mixtures of cereal grains and wild oats, no single cereal grain exceeding 50% but containing 50% or greater of total cereal grains

Grade name	Damage			Foreign material				
	Broken %	Fireburnt %	Heated %	Ergot %	Excreta %	Sclerotinia %	Stones %	Total %
Mixed Grain CE Wheat	20	0.5	10	<u>0.25</u>	0.02	<u>0.25</u>	0.1	2
Mixed Grain CE Rye	20	0.5	10	<u>0.25</u>	0.02	<u>0.25</u>	0.1	2
Mixed Grain CE Barley	20	0.5	10	<u>0.25</u>	0.02	<u>0.25</u>	0.1	2
Mixed Grain CE Oats	20	0.5	10	<u>0.25</u>	0.02	<u>0.25</u>	0.1	2
Mixed Grain CE Triticale	20	0.5	10	<u>0.25</u>	0.02	<u>0.25</u>	0.1	2
Mixed Grain CE	20	0.5	10	<u>0.25</u>	0.02	<u>0.25</u>	0.1	2
Grade, if specs for Mixed Grain not met	50% or less– Sample Feed Grain Over 50%– Sample Broken Grain	Mixed Grain, Sample CE Account Fireburnt	Mixed Grain, Sample CE Account Heated	Mixed Grain, Sample CE Account Ergot	Mixed Grain, Sample CE Account Excreta	Mixed Grain, Sample CE Account Admixture	2.5% or less– Mixed Grain, Rejected (grade) Account Stones Over 2.5%– Mixed Grain, Sample Salvage	Mixed Grain, Sample CE Account Admixture

** All grades must have less than 50.0% by weight of wild oats

Export shipments

Shipments can be commercially clean or not commercially clean. Dockage is not reported for commercially clean shipments

Commercially clean

Shipments are defined as commercially clean when meeting the commercially clean specifications listed in the export grade determinant table upon following the *Determination of commercially clean* procedures described in this chapter.

No dockage is reported for samples representing commercially clean mixed grain.

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

less a deduction of up to 0.2% to take into account the buildup of attritional material.

Grading

Mixed grain on export is graded in accordance with export specifications. Where there is no export specification the primary specification and procedures are used. The composition of samples is shown on all records and endorsed on the backs of certificates.

Export grade determinants tables

Mixed Grain, Canada Western/Canada Eastern (CW/CE)

Grade name	Foreign material other than cereal grains and wild oats						Heated %
	Material through #4.5 round-hole sieve		Ergot %	Sclerotinia %	Stones %	Total %	
	(1) Small seeds %	(2) Total %					
Mixed Grain CW/CE Wheat	0.10	0.2	0.1	<u>0.25</u>	0.1	2	10
Mixed Grain CW/CE Rye	0.10	0.2	0.1	<u>0.25</u>	0.1	2	10
Mixed Grain CW/CE Barley	0.10	0.2	0.1	<u>0.25</u>	0.1	2	10
Mixed Grain CW/CE Oats	0.10	0.2	0.1	<u>0.25</u>	0.1	2	10
Mixed Grain CW/CE Triticale	0.10	0.2	0.1	<u>0.25</u>	0.1	2	10
Mixed Grain CW/CE	0.10	0.2	0.1	<u>0.25</u>	0.1	2	10

The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness.