

14. Sunflower seed

Classes.....	14-3
Classes 	14-3
Determination of dockage.....	14-4
Definitions	14-4
Dockage not reported	14-4
Normal cleaning procedure	14-4
Composition of dockage	14-5
Commercially clean (CCLN)	14-5
Optional analysis	14-6
Grading	14-7
Important definitions	14-7
Net weight of sample	14-7
Hazardous substances in samples	14-7
Processed sample	14-7
Rounding rules	14-7
Non-registered varieties	14-7
Representative portion sizes for grading	14-8
Grading factors	14-9
Contaminated grain (CONTAM GRN)	14-9
Damage (DMG)	14-9
Dehulled (DHULL)	14-10
Earth pellets (EP)	14-10
Ergot (ERG)	14-10
Excreta (EXCR)	14-10
Extraneous material	14-10
Fertilizer pellets (FERT PLTS)	14-10
Fireburnt (FBNT)	14-10
Foreign material (FM)	14-11
Head rot damage (HEAD ROT)	14-11
Heated, rotted or mouldy (HTD)	14-11
Insect damage (I DMG)	14-11
Odour (ODOR)	14-12
Other grains (OGS)	14-12
Sclerotinia sclerotiorum (SCL)	14-12
Soft earth pellets (SEP)	14-12
Stones (STNS)	14-13
Test weight (TWT)	14-15
Treated seed and other chemical substances	14-15
Variety (VAR)	14-15
Very immature seeds (VIM SDS)	14-15
Primary and export grade determination tables	14-16
Sunflower Seed, Canada Confectionery (CAN), standard of quality	14-16
Sunflower Seed, Canada Confectionery (CAN), damage	14-16
Sunflower Seed, Canada Confectionery (CAN), foreign material included in dockage	14-16
Sunflower Seed, Canada Oil (CAN), standard of quality	14-17
Sunflower Seed, Canada Oil (CAN), damage	14-17

Sunflower Seed, Canada Oil (CAN), foreign material included in dockage	14-17
Export shipments.....	14-18
Commercially clean (CCLN).....	14-18
Not commercially clean (NCC).....	14-18
Grading	14-18

Classes

Classes

There are two classes of sunflower seeds: Confectionary and Oil.

- Confectionary sunflower seeds typically have dark grey hulls with whitish portions along the edges, or white stripes or blotches. They are larger than oil sunflower seeds.
- Oil sunflower seeds have hulls that are almost solid black in colour, although faint stripes may be visible. They are smaller than confectionary sunflower seeds.

The class of sunflower seed forms part of the grade name; for example, ‘Sunflower seed, No. 1 Canada Confectionary’.

The method of determining the class of sunflower seed is by the size and colour of the sunflower seed hull.

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 procedure 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 not reported

- ▲ **Important:** Dockage is not reported for
- Sunflower Seed, Sample Canada Account Fireburnt
 - Sunflower Seed, Sample Salvage
 - Sunflower Seed, Sample Condemned
 - Unofficial samples declared as processed

Normal cleaning procedure

- ▲ **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	# 7 # 9 for large-seeded varieties
Air control	# 5 # 7 for large-seeded varieties
Riddle	none
Top sieve	none
Centre sieve	blank tray
Bottom sieve	none
Sieve cleaner control	none

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
 - Official samples shall be at least 1 kg.
 - Unofficial samples shall be at least 1 kg.
3. Sieve portions of approximately 250 grams at a time.

4. Nest the No. 24 or No. 18 round-hole sieve over one of the following sieves, depending on the size of the seeds:
 - the No. 10 round-hole sieve
 - the No. 6 buckwheat sieve
5. Handpick from the material remaining on top of the No. 24 or No. 18 round-hole sieve all whole or broken sunflower seeds. Return them to the portion passing through the No. 24 or No. 18 round-hole sieve and remaining on top of the No. 10 round-hole or No. 6 buckwheat sieve.
6. Pass through the Carter dockage tester the material which has passed through the No. 24 or No. 18 round-hole sieve and remains on top of the No. 10 round-hole sieve (or the No. 6 buckwheat sieve).
7. Handpick whole sound sunflower seeds from the material removed by aspiration and return them to the cleaned sample.
8. Using a Boerner-type divider, divide a portion of approximately 250-g.
9. Handpick the 250-g portion for inseparable material including broken hulls. Determine what components of the handpicked inseparable material will be considered dockage as directed under **Composition of dockage**
 Note: At this point the handpicked 250-g portion should be used to determine test weight.
10. Determine dockage, using the list under **Composition of dockage**.

Composition of dockage

- Material removed by either the No. 24 or No. 18 round-hole sieve, except sound whole sunflower seeds
- Material removed by aspiration, except sound whole sunflower seeds
Note: Very immature seeds (VIM SDS) containing no meats are not considered sound.
- Material passing through either the No. 10 round-hole sieve or the No. 6 buckwheat sieve
- Coarse material handpicked from the sieved sample
- Soft earth pellets (SEP) and other grains (OGS) handpicked from the sieved sample up to 2.5%
- Sclerotinia present in the handpicked sample; up to 2% is treated as a grade determinant and also included in dockage.
Note: In samples eligible for off-grades, other grains (OGS), sclerotinia (SCL) and soft earth pellets (SEP) are considered a grading factor and are not added to the dockage.

Commercially clean (CCLN)

Samples exiting primary elevators with dockage levels up to 5.0% are considered commercially clean.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal 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.

Procedure

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 sunflower seed.
 - 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% Sunflower Seed, No. 1 Canada Confectionary

4.0% Domestic Mustard Seed, No. 1 Canada 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. Percentages by weight for grading refer to percentages of the cleaned sample, 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 section 1 of the *Canada Grain Regulations* sample as “any pesticide, desiccant or inoculant”.

Processed sample

An unofficial sample of grain declared to be conditioned or cleaned to meet end user specifications, and whereas, the determination of dockage and/or determination of commercially clean are not performed or reported.

Rounding rules

Rounding rules are outlined in [schedule 3 of the *Canada Grain Regulations*](#). When official inspection results are expressed numerically, they should be expressed to the same decimal precision as the applicable tolerance in the primary and export grade determination tables.

Non-registered varieties

A registered variety refers to varieties of crops that have been granted variety registration in Canada. Species, kinds or types of crops subject to variety registration in Canada are listed in Schedule III of the *Seeds Regulations*. Not all crops are subject to registration. The Canadian Food Inspection Agency (CFIA) is responsible for the registration of varieties in Canada. Consult the CFIA’s [database of varieties registered in Canada](#) online to determine if a given variety is registered in Canada.

Where grain of any kind is not a registered variety under the *Seeds Act*, no person shall, except with the permission of the Canadian Grain Commission, assign a statutory grade to that grain which is higher than the lowest grade established by regulation for that kind of grain.

Representative portion sizes for grading

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

The optimum representative portion is the representative sample size within the minimum and maximum range used to obtain the most accurate result when assessing an objective factor. It is determined by taking into consideration the tolerance and concentration of the objective factor being assessed.

Representative portion of sunflower seed for grading (in grams)

Grading factor	Sample portion size range	
	Minimum	Maximum
Damage	25 g	100 g
Dehulled	25 g	100 g
Ergot	500 g	working sample
Excreta	working sample	working sample
Fertilizer pellets	working sample	working sample
Fireburnt	working sample	working sample
Heated, rotted, mouldy	50 g	100 g
Head rot (hulls)	25 g	100 g
Head rot (seeds)	5 g	25 g
Insect damage	50 g	100 g
Odour	working sample	working sample
Other grains	100 g	250 g
Sclerotinia sclerotiorum	250 g	working sample
Soft earth pellets	working sample	working sample
Stones	working sample	working sample
Treated seed	working sample	working sample
Very immature seeds	25 g	100 g

Grading factors

Contaminated grain (CONTAM GRN)

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

Grain is contaminated for the purposes of the *Canada Grain Act* if the grain contains any substance in sufficient quantity that the grain is either

- (a) adulterated for the purposes of the *Food and Drugs Act*; or
- (b) contaminated within the meaning of the regulations made under section 51 of the *Safe Foods for Canadians Act*.

Treated seed

Treated seed is grain that has been adulterated with an agricultural chemical for agronomic purposes. The types of agricultural chemicals used to treat seed include pesticides, fungicides and inoculants. 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 standard for pesticide and fungicide seed treatments for cereal (including corn) is red or pink. The colour standard for pesticide and fungicide seed treatments for canola is blue; however, green has also been used. Pulse crop (including soybeans) pesticide and fungicide seed treatments are typically blue or green. The coatings or stains may appear greasy or powdery and the surface area covered may range 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.

Extraneous material

Can be defined as glass, metal, wood (including wood pellets), plastic or any other material not already defined in the Official Grain Grading Guide.

Procedure

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of extraneous material, including any foreign chemical substance other than fertilizer pellets (FERT PLTS), the sample shall be graded 'Sunflower Seed, Held IP Suspect Contaminated Grain' and submitted to the Canadian Grain Commission. Determination as to whether grain is contaminated will be made by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada.

Samples deemed to be contaminated are graded 'Sunflower Seed, Sample Condemned'.

Damage (DMG)

Damaged seeds show at least one of following characteristics:

- Head rot damage (HEAD ROT)
- Heated, rotted or mouldy (HTD)
- Very immature (VIM SDS)
- Insect-damaged (I DMG)

- Otherwise materially damaged

Dehulled (DHULL)

Hulled seeds are broken and whole seeds that are without hulls.

Earth pellets (EP)

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

Ergot (ERG)

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

Excreta (EXCR)

Excrement from any animal including mammals, birds and insects.

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

Extraneous material

See **Contaminated grain (CONTAM GRN)**

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are a manufactured plant nutrient product used by producers in the production of grain. They are typically small, round or irregular shaped and usually white, grey, brown, pink or reddish in colour.

Procedure

- Handpick any fertilizer pellets and determine the concentration in the net working sample.
 - Fertilizer pellets are assessed as stones (STNS) 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 'Sunflower Seed, Held IP Suspect Contaminated Grain'. The sample should be submitted to the Canadian Grain Commission. Determination as to whether grain is contaminated will be made by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada. Samples deemed to be contaminated are graded 'Sunflower Seed, Sample Condemned'.
-

Fireburnt (FBNT)

Fireburnt seeds are those that show any signs of being charred or scorched by fire.

Foreign material (FM)

Foreign material in sunflower seed includes other grains (OGS) , sclerotinia (SCL) and stones (STNS).

Head rot damage (HEAD ROT)

Head rot is damage most frequently caused by sclerotinia head rot disease.

Damage includes

- Hulls with 50% or more of the surface covered by white patches
- Seeds that are off colour, e.g., tan to dark brown
- Seeds that may contain small black sclerotia

Procedure

1. Using a Boerner-type divider, divide a representative portion for hulls.
 2. Examine the portion and remove hulls with white patches covering 50% or more of the hull.
 3. Divide the remaining representative portion for a subsample not less than 5 g.
 4. Remove the hulls and examine the seeds for off-colour and the presence of sclerotia.
-

Heated, rotted or mouldy (HTD)

Heated seeds have the colour and/or odour typical of seeds that have heated in storage or have been damaged by artificial drying.

Procedure

1. Pass the representative portion of the clean sample through a barley pearler for 3 to 5 seconds.
2. Separate heated, rotted or musty kernels from sound kernels.
3. Heated seeds of other grains are included in the tolerance for heated

If you are unsure whether the kernel is heated, rotted or musty, cut the seed lengthwise and examine the exposed meat. Brown-coloured meat is considered to be heated.

Insect damage (I DMG)

Insect-damaged seeds have hull perforations of any size caused by insects and include any hulled seeds which have been bored or chewed by insects.

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

If odour is the grade determinant and there is . . .	Then the grade is . . .
An excessive objectionable odour not associated with the quality of the grain, but not heated or fireburnt	Sunflower, Sample Canada Account Odour
An excessive heated odour	Sunflower, Sample Canada Account Heated
An excessive fireburnt odour	Sunflower, Sample Canada Account Fireburnt

Other grains (OGS)

Other grains are any other grains that are not removed during cleaning. Other grains are considered a grading factor and are added to the dockage.

In samples eligible for off-grades, other grains are considered a grading factor and are not added to the dockage.

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.

In samples eligible for off-grades, sclerotia are considered a grading factor and are not added to the dockage.

Soft earth pellets (SEP)

Soft earth pellets are pellets that crumble under light pressure from a finger—if they do not crumble, they are considered stones (STNS). These pellets can be

- Earth and fertilizer pellets (FERT PLTS)
- Any non-toxic material of similar consistency

Procedure

Earth pellets may be removed as dockage. See the **Normal cleaning procedure**.

In samples eligible for off-grades, soft earth pellets are considered a grading factor and are not added to the dockage.

1. Return the pellets to the sample.
2. Handpick soft earth pellets from a representative portion of 100 g of the cleaned sample.
3. If soft earth pellets is the grade determinant, grade the sample 'Sunflower Seed, Sample Canada Account Admixture'.

Stones (STNS)

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

Procedure

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.
 - Samples of grain grown in western Canada containing stones in excess of basic grade tolerances, up to 2.5% are graded ‘Sunflower 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 determination tables) that would have been assigned to the sample if it contained no stones.
 - Samples of grain grown in eastern Canada 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 ‘Sunflower Seed, Sample Canada Account Stones’.
 - Samples of western and eastern Canadian grain containing more than 2.5% stones are graded ‘Sunflower Seed, Sample Salvage’.

Examples: Western Canada

Excerpt from grade determination tables for
Sunflower Seed, Canada, Oil

Grade name	Stones %
No. 1 Canada	0.1
No. 2 Canada	0.1

Basic grade:..... Sunflower Seed, No. 1 Canada, Oil

If the above sample contained	Grade in western Canada
0.2% stones	Sunflower Seed, Rejected No. 1 Canada Oil Account Stones
3.0% stones	Sunflower Seed, Sample Salvage

Examples: Eastern Canada

Excerpt from grade determination tables for
Sunflower Seed, Canada, Oil

Grade name	Stones %
No. 1 Canada	0.1
No. 2 Canada	0.1

Basic grade:..... Sunflower Seed, No. 1 Canada, Oil

If the above sample contained	Grade in eastern Canada
0.2% stones	Sunflower Seed, Sample Canada Account Stones
3.0% stones	Sunflower Seed, Sample Salvage

Test weight (TWT)

Test weight is the weight of a known volume of grain expressed in kilograms per hectolitre. For procedures, see Chapter 1 of this guide, **Test weight**.

Treated seed and other chemical substances

See **Contaminated grain (CONTAM GRN)**.

Variety (VAR)

Only varieties registered in Canada under the *Seeds Act* are eligible for the top grades of sunflower seed.

The Canadian Food Inspection Agency (CFIA) is responsible for the registration of varieties in Canada. Consult the CFIA's [database of varieties registered in Canada](#) online to determine if a given variety is registered in Canada.

Note: On written request, the variety is shown as part of the grade name, for example, 'Sunflower Seed, No. 2 Canada Oil, AC Aurora'.

▲ **Important:** State "Varietal purity not guaranteed" in the remarks section of grading certificates issued using a varietal name.

Very immature seeds (VIM SDS)

Very immature seeds are whole sunflower seeds that contain no meat.

Procedure

1. Using a Boerner-type divider, divide a representative portion.
2. Separate whole shrunken seed kernels from sound kernels.
3. Determine the percentage of seeds that do not contain meat by either pressing the seed on a hard surface with finger pressure or by manually opening the seed.
4. Very immature seeds are included in the percentage of damaged seeds for grade determination.

Primary and export grade determination tables

Sunflower Seed, Canada Confectionery (CAN), standard of quality

Grading factor	No. 1 Canada	No. 2 Canada	Grade, if No. 2 specs not met
Degree of soundness	Well matured and sweet	Reasonably well matured and sweet	
Minimum test weight kg/hL (g/0.5 L)	31 (155)	29 (144)	Sunflower Seed, Sample Canada Account Light Weight
Variety	Any variety of confectionary sunflower registered under the <i>Seeds Act</i>	Any variety of confectionary sunflower	
Dehulled seeds %	5	5	Sunflower Seed, Sample Canada Account Dehulled

Sunflower Seed, Canada Confectionery (CAN), damage

Grading factor	No. 1 Canada	No. 2 Canada	Grade, if No. 2 specs not met
Head rot %	2	5	Sunflower Seed, Sample Canada Account Damage
Heated %	0.5	1.0	Sunflower Seed, Sample Canada Account Heated
Insect damage %	2	4	Sunflower Seed, Sample Canada Account Insect Damage
Total % Damage	4	8	Sunflower Seed, Sample Canada Account Damaged

Sunflower Seed, Canada Confectionery (CAN), foreign material included in dockage

Grading factor	No. 1 Canada	No. 2 Canada	Grade, if No. 2 specs not met
Excreta %	0.01	0.01	Sunflower Seed, Sample Canada Account Excreta
Other grains %	2.5	2.5	Sunflower Seed, Sample Canada Account Admixture
Sclerotinia %	1	2	Sunflower Seed, Sample Canada Account Admixture
Soft earth pellets %	2.5	2.5	Sunflower Seed, Sample Canada Account Admixture
Stones %	0.1	0.1	2.5% or less - Sunflower Seed, Rejected (grade) Account Stones, or Sunflower Seed, Sample Canada Account Stones Over 2.5% - Sunflower Seed, Sample Salvage

Sunflower Seed, Canada Oil (CAN), standard of quality

Grading factor	No. 1 Canada	No. 2 Canada	Grade, if No. 2 specs not met
Degree of soundness	Well matured and sweet	Reasonably well matured and sweet	
Minimum test weight kg/hL (g/0.5 L)	35 (169)	31 (148)	Sunflower Seed, Sample Canada Account Light Weight
Variety	Any variety of oil sunflower registered under the <i>Seeds Act</i>	Any variety of oil sunflower	
Dehulled seeds %	5	5	Sunflower Seed, Sample Canada Account Dehulled

Sunflower Seed, Canada Oil (CAN), damage

Grading factor	No. 1 Canada	No. 2 Canada	Grade, if No. 2 specs not met
Head rot %	2	5	Sunflower Seed, Sample Canada Account Damage
Heated %	0.5	1.0	Sunflower Seed, Sample Canada Account Heated
Insect damage %	2	4	Sunflower Seed, Sample Canada Account Insect Damage
Total % Damage	5	10	Sunflower Seed, Sample Canada Account Damaged

Sunflower Seed, Canada Oil (CAN), foreign material included in dockage

Grading factor	No. 1 Canada	No. 2 Canada	Grade, if No. 2 specs not met
Excreta %	0.02	0.02	Sunflower Seed, Sample Canada Account Excreta
Other grains %	2.5	2.5	Sunflower Seed, Sample Canada Account Admixture
Sclerotinia %	1	2	Sunflower Seed, Sample Canada Account Admixture
Soft earth pellets %	2.5	2.5	Sunflower Seed, Sample Canada Account Admixture
Stones %	0.1	0.1	2.5% or less - Sunflower Seed, Rejected (grade) Account Stones, or Sunflower Seed, Sample Canada Account Stones Over 2.5% - Sunflower Seed, Sample Salvage

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean (CCLN)

Export shipments with dockage levels up to 5.0% are considered commercially clean.

Dockage is reported to the nearest 0.1%.

Not commercially clean (NCC)

Export shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are permitted only with the permission of the Canadian Grain Commission.

For samples representing not commercially clean shipments approved by the Canadian Grain Commission for shipment from terminal elevators, dockage is reported to the nearest 0.1%.

A deduction of up to 0.2% is applied to take into account the buildup of attritional material for direct exports only. Dockage is assessed using procedures for primary samples.

Grading

Sunflower seed on export is graded in accordance with primary and export grade determination tables.