

2020-21

CWRS Canada Western Red Spring

 **CWRS**
Major Grading Factors

| | No. 1 | No. 2 | No. 3 | All Grades (other than 1&2) |
|--------------------------|-------------------|-------|-------|--------------------------------|
| Number of Samples Graded | 2338 | 1093 | 306 | 4032 |
| % of all grades | 58.0% | 27.1% | 7.6% | 100 |
| Grading Factor* | % of grade | | | |
| Frost | n/a | 10.4% | 4.6% | 17.3% |
| Non-HVK | n/a | 10.8% | n/a | 10.8% |
| Fusarium Damage | n/a | 3.8% | 0.7% | 4.8% |
| Midge | n/a | 3.2% | 0.5% | 3.8% |
| Severely Sprouted | n/a | 2.3% | 1.7% | 6.2% |

Top Five CWRS Varieties Grown in 2020

- 1 AAC Brandon
- 2 AAC Viewfield
- 3 CDC Landmark
- 4 AAC Elie
- 5 AAC Redberry

Source: Canadian Grain Commission

*A sample can be downgraded for more than one factor

 **CWRS**
Protein Content, %

| Province | Mean | Standard Deviation |
|-------------------|------|--------------------|
| No. 1 CWRS | | |
| Manitoba | 14.0 | 0.9 |
| Saskatchewan | 13.4 | 1.3 |
| Alberta and B.C. | 13.1 | 1.4 |
| Western Canada | 13.4 | 1.3 |
| No. 2 CWRS | | |
| Manitoba | 13.8 | 1.0 |
| Saskatchewan | 12.8 | 1.3 |
| Alberta and B.C. | 12.8 | 1.4 |
| Western Canada | 13.1 | 1.3 |
| All Grades | | |
| Manitoba | 13.9 | 0.9 |
| Saskatchewan | 13.2 | 1.3 |
| Alberta and B.C. | 13.1 | 1.4 |
| Western Canada | 13.3 | 1.3 |

Grading factor and protein content analysis conducted by Canadian Grain Research Laboratory as of November 4, 2020, basis the Harvest Sample Program.

No. 1 CWRS
Canada Western Red Spring

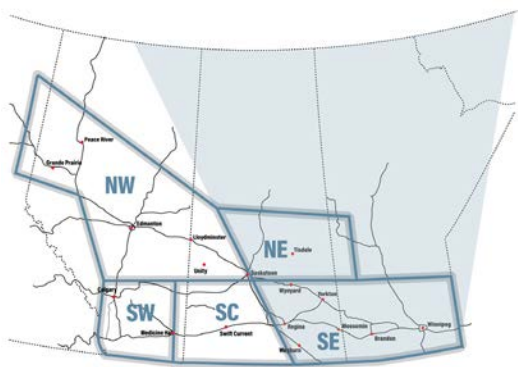
2020

| Quality Parameter ^a | Western Composite ^b |
|---------------------------------------|--------------------------------|
| Wheat | |
| Test Weight, kg/hL | 83.2 |
| Weight Per 1000 Kernels, g | 37.0 |
| Protein Content, % | 13.2 |
| Protein Content, % (dry matter basis) | 15.3 |
| Ash Content, % | 1.51 |
| Falling Number, s | 392 |
| Particle Size Index, % | 48 |

Milling Flour Yield Bühler Laboratory Mill

| | |
|-------------------------|------|
| Total Products Basis, % | 74.5 |
| 0.50% Ash Basis, % | 77.0 |

FIGURE 1
Western Canadian CWRS Composite regions



^a Data are reported on a 13.5% moisture basis for wheat and a 14.0% moisture basis for flour.

^b Refer to crop region map (Figure 1, non-shaded area).

n/a = Not available (testing will not be conducted).

Grading factor and protein content analysis conducted by Canadian Grain Research Laboratory as of November 4, 2020, basis the Harvest Sample Program.

2020

Quality Parameter ^a

Western Composite ^b

| Quality Parameter ^a | Flour ^c | | |
|---|----------------------|-------------|--------------|
| | Straight Grade 74.5% | 74% | 60% |
| Extraction, % | | | |
| Protein Content, % | 12.5 | 12.4 | 11.9 |
| Protein Loss, % | 0.7 | 0.8 | 1.3 |
| Wet Gluten Content, % | 35.7 | 35.9 | 33.9 |
| Gluten Index, % | 87 | 90 | 92 |
| Ash Content, % | 0.45 | 0.46 | 0.40 |
| Minolta colour - L* | 85.4 | 85.1 | 85.9 |
| Starch Damage, UCD | 26.6 | 26.7 | 27.0 |
| Amylograph Peak Viscosity, BU | 659 | 677 | 716 |
| Farinogram ^c | | | |
| Absorption, % | 67.2 | 67.8 | 67.0 |
| Dough Development Time (DDT), min | 8.1 | 7.9 | 7.8 |
| Stability, min | 14.2 | 14.1 | 17.2 |
| Mixing Tolerance Index, (MTI) BU | 19 | 19 | 17 |
| Extensogram | | | |
| Maximum Resistance (Rmax), BU | 534 | 532 | 569 |
| Extensibility (Length), cm | 21.8 | 20.3 | 19.8 |
| Area, cm ² | 146 | 132 | 144 |
| Alveogram | | | |
| P (height x 1.1), mm | 133 | 137 | 144 |
| L (length), mm | 93 | 96 | 85 |
| P/L | 1.43 | 1.43 | 1.69 |
| W, 10-4 J | 462 | 490 | 466 |
| Ie, % | 66.8 | 67.2 | 66.5 |
| Baking (No Time Dough) | | | |
| Absorption, % | 71 | n/a | n/a |
| Mixing Time, min | 6.3 | n/a | n/a |
| Specific Volume, cm ³ /g | 7.0 | n/a | n/a |
| Total Bread Score (out of 10) | 9.4 | n/a | n/a |
| Baking (Sponge & Dough) | | | |
| Absorption, % | 70 | n/a | 68 |
| Mixing Time, min | 8.2 | n/a | 7.5 |
| Specific Volume, cm ³ /g | 6.6 | n/a | 6.7 |
| Total Bread Score (out of 10) | 9.9 | n/a | 10.0 |
| Noodles (Fresh Yellow Alkaline) | | | |
| Colour (3h / 24h) L* | n/a | 73.5 / 68.2 | 75.8 / 70.6 |
| a* | n/a | 0.20 / 0.96 | -0.13 / 0.58 |
| b* | n/a | 26.5 / 25.3 | 26.2 / 25.3 |
| Cooked Noodle Max. Cutting Stress g/mm² | | | |
| Cook Time - 3.5 min | n/a | 41.8 | 39.0 |
| Noodles (Fresh White Salted) | | | |
| Colour (3h / 24h) L* | n/a | 75.5 / 72.2 | 76.7 / 74.0 |
| a* | n/a | 1.60 / 2.07 | 1.18 / 1.56 |
| b* | n/a | 25.2 / 24.5 | 25.1 / 24.6 |
| Cooked Noodle Max. Cutting Stress g/mm² | | | |
| Cook Time - 3.5 min | n/a | 26.2 | 24.6 |

EASTERN COMPOSITE

No. 1 CWRS
Canada Western Red Spring

2020

Quality Parameter ^a

Eastern Composite ^b

| Flour ^c | | |
|---|--------------------|-------------|
| Quality Parameter ^a | Straight Grade 76% | 74% |
| Extraction, % | | |
| Protein Content, % | 13.0 | 12.8 |
| Protein Loss, % | 0.7 | 0.9 |
| Wet Gluten Content, % | 37.1 | 35.9 |
| Gluten Index, % | 92 | 93 |
| Ash Content, % | 0.48 | 0.42 |
| Minolta colour - L* | 84.8 | 85.4 |
| Starch Damage, UCD | 25.7 | 26.3 |
| Amylograph Peak Viscosity, BU | 682 | 660 |
| Farinogram | | |
| Absorption, % | 66.3 | 66.0 |
| Dough Development Time (DDT), min | 7.7 | 8.0 |
| Stability, min | 13.5 | 15.4 |
| Mixing Tolerance Index, (MTI) BU | 18 | 19 |
| Extensogram | | |
| Maximum Resistance (Rmax), BU | 527 | 615 |
| Extensibility (Length), cm | 21.6 | 20.6 |
| Area, cm ² | 145 | 159 |
| Alveogram | | |
| P (height x 1.1), mm | 117 | 125 |
| L (length), mm | 123 | 112 |
| P/L | 0.95 | 1.12 |
| W, 10-4 J | 516 | 519 |
| le, % | 68.1 | 69.7 |
| Baking (No Time Dough) | | |
| Absorption, % | 69 | n/a |
| Mixing Time, min | 6.3 | n/a |
| Specific Volume, cm ³ /g | 7.3 | n/a |
| Total Bread Score (out of 10) | 9.9 | n/a |
| Baking (Sponge & Dough) | | |
| Absorption, % | 68 | n/a |
| Mixing Time, min | 7.7 | n/a |
| Specific Volume, cm ³ /g | 6.9 | n/a |
| Total Bread Score (out of 10) | 9.8 | n/a |
| Noodles (Fresh Yellow Alkaline) | | |
| Colour (3h / 24h) L* | n/a | 73.4 / 68.9 |
| a* | n/a | 0.25 / 0.78 |
| b* | n/a | 25.9 / 24.8 |
| Cooked Noodle Max. Cutting Stress g/mm ² | | |
| Cook Time - 3.5 min | n/a | 42.0 |
| Noodles (Fresh White Salted) | | |
| Colour (3h / 24h) L* | n/a | 75.1 / 71.3 |
| a* | n/a | 1.88 / 2.32 |
| b* | n/a | 24.9 / 24.5 |
| Cooked Noodle Max. Cutting Stress g/mm ² | | |
| Cook Time - 3.5 min | n/a | 27.2 |

2020

| Quality Parameter ^a | Wheat |
|---------------------------------------|-------|
| Test Weight, kg/hL | 81.8 |
| Weight Per 1000 Kernels, g | 36.3 |
| Protein Content, % | 13.7 |
| Protein Content, % (dry matter basis) | 15.9 |
| Ash Content, % | 1.55 |
| Falling Number, s | 413 |
| Particle Size Index, % | 50 |

Milling Flour Yield Bühler Laboratory Mill

| | |
|-------------------------|------|
| Total Products Basis, % | 76.0 |
| 0.50% Ash Basis, % | 77.0 |

FIGURE 1
Western Canadian CWRS Composite regions



^a Data are reported on a 13.5% moisture basis for wheat and a 14.0% moisture basis for flour.

^b Refer to crop region map (Figure 1, shaded area).

n/a = Not available (testing will not be conducted).

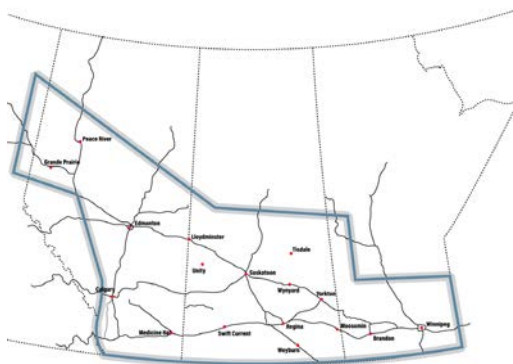
Milling, analytical, and end product analysis conducted by Cigi, the Technical Division of Cereals Canada, based on Cereals Canada Harvest Assessment samples representing grain available for export.

PRAIRIE COMPOSITE

No. 2 CWRS
Canada Western Red Spring

| 2020 | |
|--|--------------------------------|
| Quality Parameter ^a | Prairie Composite ^b |
| Wheat | |
| Test Weight, kg/hL | 82.4 |
| Weight Per 1000 Kernels, g | 37.8 |
| Protein Content, % | 13.2 |
| Protein Content, % (dry matter basis) | 15.3 |
| Ash Content, % | 1.56 |
| Falling Number, s | 368 |
| Particle Size Index, % | 51 |
| Milling Flour Yield Bühler Laboratory Mill | |
| Total Products Basis, % | 75.5 |
| 0.50% Ash Basis, % | 76.0 |

FIGURE 2
Western Canadian
Prairie Composite Regions



^a Data are reported on a 13.5% moisture basis for wheat and a 14.0% moisture basis for flour.

^b Refer to crop region map (Figure 2).

n/a = Not available (testing will not be conducted).

Milling, analytical, and end product analysis conducted by Cigi, the Technical Division of Cereals Canada, based on Cereals Canada Harvest Assessment samples representing grain available for export.

| 2020 | | |
|---|--------------------------------|-------------|
| Quality Parameter ^a | Prairie Composite ^b | |
| Flour | | |
| | Straight Grade 76% | 74% |
| Extraction, % | | |
| Protein Content, % | 12.5 | 12.3 |
| Protein Loss, % | 0.6 | 0.9 |
| Wet Gluten Content, % | 35.1 | 35.3 |
| Gluten Index, % | 89 | 85 |
| Ash Content, % | 0.49 | 0.46 |
| Minolta colour - L* | 85.0 | 85.3 |
| Starch Damage, UCD | 26.1 | 26.0 |
| Amylograph Peak Viscosity, BU | 451 | 464 |
| Farinogram | | |
| Absorption, % | 66.4 | 66.2 |
| Dough Development Time (DDT), min | 7.2 | 8.2 |
| Stability, min | 12.0 | 12.8 |
| Mixing Tolerance Index, (MTI) BU | 20 | 24 |
| Extensogram | | |
| Maximum Resistance (Rmax), BU | 448 | 517 |
| Extensibility (Length), cm | 23.0 | 21.2 |
| Area, cm ² | 131 | 136 |
| Alveogram | | |
| P (height x 1.1), mm | 121 | 125 |
| L (length), mm | 108 | 106 |
| P/L | 1.12 | 1.18 |
| W, 10-4 J | 464 | 478 |
| le, % | 65.7 | 66.4 |
| Baking (No Time Dough) | | |
| Absorption, % | 70 | n/a |
| Mixing Time, min | 5.8 | n/a |
| Specific Volume, cm ³ /g | 6.8 | n/a |
| Total Bread Score (out of 10) | 9.4 | n/a |
| Baking (Sponge & Dough) | | |
| Absorption, % | 69 | n/a |
| Mixing Time, min | 7.7 | n/a |
| Specific Volume, cm ³ /g | 7.0 | n/a |
| Total Bread Score (out of 10) | 10.0 | n/a |
| Noodles (Fresh Yellow Alkaline) | | |
| Colour (3h / 24h) L* | n/a | 72.8 / 68.0 |
| a* | n/a | 0.38 / 1.12 |
| b* | n/a | 25.6 / 24.6 |
| Cooked Noodle Max. Cutting Stress g/mm ² | | |
| Cook Time - 3.5 min | n/a | 39.6 |
| Noodles (Fresh White Salted) | | |
| Colour (3h / 24h) L* | n/a | 75.6 / 71.6 |
| a* | n/a | 1.61 / 2.08 |
| b* | n/a | 23.7 / 23.0 |
| Cooked Noodle Max. Cutting Stress g/mm ² | | |
| Cook Time - 3.5 min | n/a | 27.4 |