

Project Title: Evaluation of spring wheat cultivar performance under continuous-crop and crop-crop-fallow systems in central Montana

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Objective: Evaluate relative performance spring wheat cultivars and development lines in central Montana crop environments.

Results: Twenty spring wheat entries were established on NTCC at Moccasin, Denton, Geraldine, and Ft. Benton. The 2012 growing season was warmer and dryer than the long term average. Geraldine had more optimal precipitation. Warm spring growing conditions were interrupted with of freezing temperatures. At CARC, it froze five consecutive nights May 24-29. The spring wheat showed less frost stress than barley. Driving hail on June 5 removed 10-15% of the spring wheat leaf tissue. 2012 Sawfly cutting was minimal to none. The 2012 spring wheat crop ripened 10-15d earlier than normal. Ft. Benton trial is the first there in ten years.

Three NTCC site mean yields, Moccasin-21.1 bu/a, Denton-23.2 bu/a, Geraldine-30.4, are surprisingly close to the recent six year average (Tables 1-7). Ft. Benton data represents one rep. A down pour buried the seed too deep. Outlook, MT1008, IMICHT79 and SY Tyra were the high yielders for the four locations, respectively. Test weights were low, particularly at Moccasin and Denton at 55.0 and 56.24 lbs/bu, respectively. Geraldine and Ft. Benton both had trial mean test weights of 58.8 lbs/bu. Volt had the high test weight across the four locations. The mean protein content across all four locations was above 15%. Moccasin averaged 18.1% with Mott having trial high protein at 19.3%. Mott had the high protein at Denton with 16.9%. McNeal and Mott, at 17.6% and 17.2% protein, respectively, had the high protein contents at Geraldine. Hank top the Fort Benton location at 16.9% grain protein content.

Vida is used as the standard for multi-year comparison of spring wheat cultivars for yield, test weight, protein, and plant height (See Tables 5-13). Vida is consistently the high or near high grain producer at all three locations. Vida had much below average yield at Moccasin in 2008 which pulls its multi-year mean yield below the mean yields of Outlook, Oneal and Fortuna. Vida is near the mean for test weight and slightly below the mean for grain protein. Mott was frequently at or near the top for protein content.

Summary: 2012 Was a droughty year. However, the 2012 yields were not as far off the six year average as might have been expected.

Funding Summary: Expenditure information to be provided by OSP. No other grant support was provided.

MWBC FY2011 Grant Submission Plans: It is planned to submit this project for funding consideration in the next fiscal year.

Table 1 2012 Moccasin no-till recrop spring wheat cultivar evaluation trial.
Exp 129970 Central Agricultural Research Center. Moccasin, Montana

| Cultivar | trt | Plant Height | Grain Yield | Test Weight | Protein Content |
|-------------|-----|--------------|-------------|-------------|-----------------|
| | # | cm | bu/a | lbs/bu | % |
| OUTLOOK | 4 | 58 | 25.1 | 55.6 | 15.9 |
| ONEAL | 12 | 57 | 24.5 | 55.7 | 18.8 |
| MT 1053 | 20 | 55 | 23.2 | 54.4 | 17.8 |
| FORTUNA | 1 | 62 | 22.9 | 54.6 | 18.2 |
| MCNEAL | 2 | 60 | 22.8 | 53.7 | 18.2 |
| WB GUNNISON | 17 | 56 | 21.9 | 54.4 | 18.3 |
| MT 1008 | 19 | 55 | 21.5 | 55.1 | 17.7 |
| CHOTEAU | 5 | 57 | 21.4 | 55.4 | 17.3 |
| VIDA | 6 | 51 | 21.2 | 54.7 | 17.3 |
| DUCLAIR | 7 | 58 | 21.2 | 54.3 | 17.4 |
| IMICHT79 | 13 | 48 | 20.9 | 55.3 | 17.9 |
| HANK | 8 | 57 | 20.8 | 53.0 | 19.1 |
| JEDD | 11 | 56 | 20.6 | 56.3 | 18.7 |
| VOLT | 10 | 55 | 20.2 | 56.7 | 18.1 |
| REEDER | 3 | 53 | 20.1 | 56.6 | 17.5 |
| MOTT | 16 | 53 | 19.7 | 54.5 | 19.3 |
| CORBIN | 9 | 59 | 19.4 | 55.1 | 18.6 |
| SY TYRA | 18 | 50 | 18.8 | 54.9 | 18.3 |
| KUNTZ | 14 | 57 | 18.8 | 55.4 | 18.5 |
| AP604CL | 15 | 59 | 16.4 | 53.7 | 19.2 |
| Mean | | 55.9 | 21.1 | 55.0 | 18.1 |
| P-value | | 0.00 | 0.02 | 0.00 | |
| CV 1 | | 3.6 | 11.3 | 1.3 | |
| LSD (0.05) | | 3.34 | 3.94 | 1.45 | |

Seed Date: 02 April 12 SE3d No-till continuous crop into lentil stubble.

Soil: 2' depth temp:13 C Moisture Probe: 14"

Fertilizer: Top dress 60 N W/seed: 50 lbs 20+20+20+10

Harvest: 6-Aug-12

Growing season: Below average precipitation. Spring conditions conducive to good root establishment. Above average temperature increased drought conditions.

Table 2 2012 Denton no-till recrop spring wheat cultivar evaluation trial.
Exp 129970 Central Agricultural Research Center. Moccasin, Montana

| Cultivar | trt | Plant Height | Grain Yield | Test Weight | Protein Content |
|-------------|-----|--------------|-------------|-------------|-----------------|
| | # | cm | bu/a | lbs/bu | % |
| MT 1008 | 19 | 63 | 28.4 | 58.2 | 13.5 |
| VIDA | 6 | 63 | 26.9 | 56.0 | 15.2 |
| MT 1053 | 20 | 59 | 26.3 | 56.8 | 13.8 |
| ONEAL | 12 | 62 | 25.9 | 57.3 | 15.5 |
| WB GUNNISON | 17 | 60 | 25.6 | 57.0 | 15.5 |
| KUNTZ | 14 | 61 | 23.8 | 58.4 | 15.7 |
| HANK | 8 | 62 | 23.6 | 52.5 | 16.5 |
| SY TYRA | 18 | 59 | 22.9 | 57.0 | 15.1 |
| CORBIN | 9 | 57 | 22.7 | 54.6 | 16.1 |
| FORTUNA | 1 | 65 | 22.6 | 56.2 | 14.7 |
| JEDD | 11 | 56 | 22.6 | 56.5 | 15.8 |
| OUTLOOK | 4 | 64 | 22.5 | 54.3 | 14.9 |
| IMICHT79 | 13 | 56 | 22.4 | 57.2 | 15.0 |
| REEDER | 3 | 58 | 22.3 | 56.8 | 15.1 |
| MOTT | 16 | 65 | 22.3 | 57.3 | 16.9 |
| AP604CL | 15 | 66 | 21.2 | 55.2 | 16.6 |
| VOLT | 10 | 61 | 21.2 | 57.5 | 16.0 |
| CHOTEAU | 5 | 59 | 20.4 | 57.2 | 14.9 |
| MCNEAL | 2 | 61 | 20.3 | 55.4 | 15.8 |
| DUCLAIR | 7 | 65 | 20.0 | 53.8 | 15.6 |
| Mean | | 61.0 | 23.2 | 56.24 | 15.41 |
| P-value | | 0.082 | 0.001 | 0.000 | |
| CV 1 | | 6.8 | 9.4 | 1.5 | |
| LSD (0.05) | | 6.9 | 3.62 | 1.73 | |

Seeded: 25 -April- 2012 On Lentil stubble seeding conditions great

Soil: Temp: 16C Moisture probe depth 18"

Fertilizer: Top dress 60 N W/seed: 50 lbs 20+20+20+10

Harvest: 07-Aug- 2012

Growing season: Below average precipitation. Spring conditions conducive to good root establishment.

Table 3 2012 Geraldine No-till recrop spring wheat cultivar evaluation trial.
Exp 129972 Central Agricultural Research Center, Moccasin, Montana

| Cultivar | trt | Plant Height | Grain Yield | Test Weight | Protein Content |
|-------------|-----|--------------|-------------|-------------|-----------------|
| | # | cm | bu/a | lbs/bu | % |
| IMICHT79 | 13 | 61 | 33.8 | 59.3 | 16.5 |
| OUTLOOK | 4 | 72 | 33.8 | 58.5 | 15.9 |
| MT 1053 | 20 | 65 | 32.9 | 57.3 | 16.9 |
| VIDA | 6 | 70 | 32.6 | 58.1 | 16.2 |
| REEDER | 3 | 65 | 32.1 | 58.8 | 16.4 |
| KUNTZ | 14 | 64 | 31.9 | 60.6 | 16.4 |
| JEDD | 11 | 60 | 31.5 | 58.7 | 16.9 |
| CHOTEAU | 5 | 69 | 31.1 | 59.5 | 16.4 |
| ONEAL | 12 | 72 | 30.6 | 58.7 | 16.7 |
| WB GUNNISON | 17 | 65 | 30.5 | 58.5 | 16.7 |
| DUCLAIR | 7 | 74 | 30.4 | 56.3 | 17.0 |
| HANK | 8 | 68 | 30.3 | 56.6 | 16.8 |
| VOLT | 10 | 66 | 29.7 | 60.3 | 17.5 |
| CORBIN | 9 | 69 | 29.0 | 57.8 | 16.5 |
| MT 1008 | 19 | 66 | 28.9 | 58.9 | 16.3 |
| SY TYRA | 18 | 64 | 28.6 | 57.8 | 16.7 |
| AP604CL | 15 | 73 | 28.5 | 58.3 | 17.1 |
| MCNEAL | 2 | 76 | 28.1 | 57.3 | 17.6 |
| MOTT | 16 | 77 | 27.6 | 59.2 | 17.2 |
| FORTUNA | 1 | 81 | 26.3 | 59.0 | 16.5 |
| Mean | | 68.9 | 30.4 | 58.5 | 16.7 |
| P-value | | 0.00 | 0.05 | 0.00 | 0.00 |
| CV 1 | | 0 | 8.8 | 1.3 | 0 |
| LSD (0.05) | | 0 | 4.41 | 1.53 | 0 |

Seed Date: 25-Apr-12 NTRC on winter wheat stubble (heavy)

Seed Conditions: 2" Soil Temp: 12C probe depth 18"

Fertilizer: Top dress 90 N W/seed: 50 lbs 20+20+20+10

Harvest: 07-Aug- 2012

Growing season: Below average precipitation. Spring conditions conducive to good root establishment.

Table 4 2012 Ft. Benton no-till recrop spring wheat cultivar evaluation trial.
 Exp 129970 Central Agricultural Research Center. Moccasin, Montana

| Cultivar | trt | Plant Height | Grain Yield | Test Weight | Protein Content |
|-------------|-----|--------------|-------------|-------------|-----------------|
| | # | cm | bu/a | lbs/bu | % |
| SY TYRA | 18 | 52 | 28.8 | 60.8 | 14.5 |
| MT 1008 | 19 | 57 | 27.9 | 59.6 | 14.8 |
| VIDA | 6 | 57 | 27.2 | 58.4 | 15.4 |
| FORTUNA | 1 | 75 | 27.1 | 58.2 | 15.3 |
| MCNEAL | 2 | 67 | 26.9 | 58.4 | 15.7 |
| REEDER | 3 | 67 | 26.6 | 57.8 | 16.2 |
| MT 1053 | 20 | 52 | 26.1 | 60.3 | 14.9 |
| VOLT | 10 | 63 | 26.0 | 60.3 | 15.8 |
| OUTLOOK | 4 | 65 | 25.7 | 55.5 | 15.7 |
| WB GUNNISON | 17 | 57 | 25.7 | 59.7 | 15.0 |
| DUCLAIR | 7 | 62 | 25.4 | 56.2 | 16.1 |
| CORBIN | 9 | 65 | 25.1 | 57.4 | 16.5 |
| HANK | 8 | 62 | 24.7 | 55.1 | 16.9 |
| IMICHT79 | 13 | 56 | 23.8 | 58.7 | 15.9 |
| CHOTEAU | 5 | 56 | 23.7 | 57.2 | 16.6 |
| ONEAL | 12 | 63 | 23.6 | 58.1 | 16.5 |
| JEDD | 11 | 60 | 23.4 | 59.1 | 15.6 |
| MOTT | 16 | 65 | 22.4 | 59.9 | 16.1 |
| AP604CL | 15 | 64 | 21.0 | 58.8 | 15.9 |
| KUNTZ | 14 | 61 | 20.9 | 59.8 | 16.3 |
| Mean | | 61.3 | 25.1 | 58.5 | 15.8 |

Only one rep was harvested. Poor stand establishment

Seed Date: 25-Apr-12 NTRC on winter wheat stubble cut short.
 Seed Conditions: Soil Temp 20 C probe depth 24"
 Post Plant Chemical Fallow: Tom Allen applied glyphosate on April 26.
 Fertilizer: Top dress 90 N W/seed: 50 lbs 20+20+20+10
 Harvest: 07-Aug- 2012
 Growing season: Seed bed conditions were good. Down poor filled double disk furrow, and high temperatures crusting and a poor stand. One rep was harvested.

Table 5 Moccasin multi-year spring wheat variety yields under no-till CC.
Exp 9970 Central Agricultural Research Center. Moccasin, Montana.

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | Average | Vida Same Yrs |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-------------|------------------|
| | | | | bu/a | | | | |
| AP604 CL | | | 16 | 26 | 28 | 16 | 21.6 | 27.5 |
| Choteau | 32 | 17 | 26 | 27 | 28 | 21 | 25.0 | 26.0 |
| Corbin | 33 | 14 | 23 | 31 | 25 | 19 | 24.2 | 26.0 |
| Duclair | | | | 30 | 32 | 21 | 27.7 | 27.9 |
| Fortuna | 30 | 24 | 26 | 34 | 32 | 23 | 28.0 | 26.0 |
| Hank | 32 | 25 | 20 | 27 | 27 | 21 | 25.3 | 26.0 |
| Jedd | | 16 | 24 | 29 | 30 | 21 | 23.8 | 25.1 |
| IMICHT79 | | | | | 27 | 21 | 23.8 | 26.6 |
| WB Gunnison | | | | | 26 | 22 | 24.0 | 26.6 |
| SY Tyra | | | | | 23 | 19 | 20.9 | 26.6 |
| Kuntz | | 19 | 21 | 22 | 24 | 19 | 20.9 | 25.1 |
| McNeal | 33 | 18 | 28 | 30 | 27 | 23 | 26.6 | 26.0 |
| Mott | | | | 33 | 29 | 20 | 27.1 | 27.9 |
| ONeal | | 16 | 28 | 33 | 34 | 25 | 27.1 | 25.1 |
| Outlook | 32 | 16 | 29 | 33 | 29 | 25 | 27.1 | 26.0 |
| Reeder | 31 | 15 | 24 | 28 | 32 | 20 | 25.1 | 26.0 |
| Vida | 31 | 16 | 27 | 30 | 32 | 21 | 26.0 | 26.0 |
| Volt | | 23 | 21 | 24 | 27 | 20 | 23.0 | 25.1 |
| Means | 31.2 | 18.1 | 23.4 | 29.3 | 28.6 | 21.1 | | |

Varieties with multi-year mean yield > than **Vida** for the same years are in **bold**.

Table 6 Denton multi-year no-till CC spring wheat yield performance.
Exp 9971 Central Agricultural Research Center. Moccasin, Montana.

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | Average | Vida Same Yrs. |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-------------|-------------------|
| | | | | bu/a | | | | |
| AP604CL | | | 26 | 28 | 16 | 21 | 22.8 | 29.0 |
| Choteau | 22 | 14 | 26 | 37 | 16 | 20 | 22.5 | 26.5 |
| Corbin | 23 | 16 | 28 | 35 | 16 | 23 | 23.5 | 26.5 |
| Duclair | | | | 37 | 16 | 20 | 24.1 | 27.0 |
| Fortuna | 19 | 17 | 26 | 32 | 15 | 23 | 21.9 | 26.5 |
| Hank | 24 | 16 | 32 | 24 | 17 | 24 | 22.7 | 26.5 |
| IMICHT79 | | | | | 16 | 22 | 19.1 | 22.3 |
| Jedd | | 18 | 31 | 31 | 17 | 23 | 23.9 | 26.8 |
| Kuntz | | 17 | 30 | 21 | 16 | 24 | 21.5 | 26.8 |
| McNeal | 24 | 17 | 22 | 30 | 16 | 20 | 21.6 | 26.5 |
| Mott | | | | 32 | 16 | 22 | 23.7 | 27.0 |
| ONeal | | 19 | 33 | 37 | 16 | 26 | 26.2 | 26.8 |
| Outlook | 23 | 14 | 28 | 32 | 18 | 23 | 22.8 | 26.5 |
| Reeder | 21 | 16 | 27 | 28 | 17 | 22 | 22.0 | 26.5 |
| SY Tyra | | | | | 16 | 23 | 19.6 | 22.3 |
| Vida | 25 | 18 | 35 | 36 | 18 | 27 | 26.5 | 26.5 |
| Volt | | 16 | 29 | 22 | 16 | 21 | 20.9 | 26.8 |
| WB Gunnison | | | | | 17 | 26 | 21.3 | 22.3 |
| Mean | 22.7 | 16.6 | 27.8 | 31.0 | 16.3 | 23.2 | | |

Varieties with multi-year mean > than **Vida** for the same years are in **bold**.

Table 7 Geraldine multi-year spring wheat variety yield performance.
Exp 9972 Central Agricultural Research Center. Moccasin, Montana.

| Variety | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | Vida | |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|------------------|-------------|
| | | | | | | | Average same Yrs | |
| | | | | bu/a | | | | |
| AP604CL | | | 24 | 24 | 23 | 29 | 24.9 | 32.5 |
| Choteau | 40 | 28 | 26 | 32 | 27 | 31 | 30.8 | 34.6 |
| Corbin | 39 | 25 | 25 | 36 | 30 | 29 | 30.7 | 34.6 |
| Duclair | | | | 34 | 27 | 30 | 30.2 | 32.8 |
| Fortuna | 34 | 25 | 23 | 35 | 25 | 26 | 28.1 | 34.6 |
| Hank | 37 | 25 | 24 | 25 | 27 | 30 | 27.9 | 34.6 |
| IMICHT79 | | | | | 28 | 34 | 30.7 | 31.7 |
| Jedd | | 21 | 24 | 28 | 24 | 32 | 25.6 | 31.6 |
| Kuntz | | 19 | 22 | 20 | 24 | 32 | 23.3 | 31.6 |
| McNeal | 31 | 22 | 26 | 26 | 26 | 28 | 26.4 | 34.6 |
| Mott | | | | 33 | 24 | 28 | 28.3 | 32.8 |
| ONeal | | 29 | 29 | 35 | 28 | 31 | 30.4 | 31.6 |
| Outlook | 40 | 24 | 24 | 31 | 28 | 34 | 30.1 | 34.6 |
| Reeder | 40 | 27 | 27 | 28 | 27 | 32 | 30.0 | 34.6 |
| SY Tyra | | | | | 23 | 29 | 25.8 | 31.7 |
| Vida | 50 | 28 | 32 | 35 | 31 | 33 | 34.6 | 34.6 |
| Volt | | 22 | 30 | 23 | 28 | 30 | 26.6 | 31.6 |
| WB Gunnison | | | | | 29 | 31 | 29.6 | 31.7 |
| Mean | 39.8 | 23.1 | 25.4 | 30.2 | 26.5 | 30.4 | | |

Varieties multi-year mean yields > than **Vida** for the same years are in **bold**.

Table 8 Moccasin multi-Year spring wheat test weights under no-till CC.
Exp 997010 Central Agricultural Research Center. Moccasin, Montana.

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | Vida | |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------------|-------------|
| | | | | | | | Average Same Yrs | |
| | | | | lbs/bu | | | | |
| AP604 CL | | | 59.8 | 58.8 | 59.6 | 53.7 | 58.0 | 58.3 |
| Choteau | 53.7 | 58.6 | 58.7 | 59.8 | 60.1 | 55.4 | 57.7 | 57.5 |
| Corbin | 52.4 | 58.6 | 60.5 | 59.0 | 59.0 | 55.1 | 57.4 | 57.5 |
| Duclair | | | | 58.1 | 57.9 | 54.3 | 56.8 | 57.9 |
| Fortuna | 53.9 | 58.1 | 59.2 | 59.8 | 60.2 | 54.6 | 57.6 | 57.5 |
| Hank | 50.7 | 56.9 | 59.4 | 56.2 | 58.3 | 53.0 | 55.7 | 57.5 |
| Jedd | | 58.8 | 60.7 | 58.9 | 60.0 | 56.3 | 58.9 | 58.4 |
| IMICHT79 | | | | | 60.0 | 55.3 | 57.6 | 57.0 |
| WB Gunnison | | | | | 59.7 | 54.4 | 57.0 | 57.0 |
| SY Tyra | | | | | 60.1 | 54.9 | 57.5 | 57.0 |
| Kuntz | | 58.4 | 59.7 | 59.5 | 59.6 | 55.4 | 58.5 | 58.4 |
| McNeal | 52.3 | 57.5 | 59.8 | 59.1 | 58.9 | 53.7 | 56.9 | 57.5 |
| Mott | | | | 59.0 | 59.2 | 54.5 | 57.6 | 57.9 |
| ONeal | | 59.4 | 61.2 | 60.4 | 60.2 | 55.7 | 59.4 | 58.4 |
| Outlook | 51.4 | 57.3 | 58.9 | 58.7 | 59.7 | 55.6 | 56.9 | 57.5 |
| Reeder | 54.0 | 58.7 | 60.7 | 60.6 | 61.1 | 56.6 | 58.6 | 57.5 |
| Vida | 53.5 | 58.8 | 59.3 | 59.7 | 59.4 | 54.7 | 57.5 | 57.5 |
| Volt | | 59.8 | 60.9 | 60.6 | 60.8 | 56.7 | 59.8 | 58.4 |
| Means | 53.21 | 58.51 | 59.98 | 59.41 | 59.74 | 54.95 | | |

Varieties with multi-year mean > than **Vida** for the same years are in **bold**.

Table 9 Denton multi-year spring wheat variety test weight in no-till CC.
Exp 9971 Central Agricultural Research Center. Moccasin, Montana.

| Pedigree | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | average | Vida |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | | | | | | | | Same Yrs |
| | | | | lbs/bu | | | | |
| AP604CL | | | 62.9 | 61.1 | 62.3 | 55.2 | 60.4 | 59.6 |
| Choteau | 55.9 | 59.6 | 61.7 | 60.4 | 61.5 | 57.2 | 59.4 | 59.2 |
| Corbin | 55.7 | 58.8 | 61.9 | 60.1 | 61.5 | 54.6 | 58.8 | 59.2 |
| Fortuna | 56.0 | 59.6 | 62.4 | 59.5 | 61.3 | 56.2 | 59.1 | 59.2 |
| Duclair | | | | 60.1 | 61.2 | 53.8 | 58.4 | 58.8 |
| Hank | 53.7 | 58.1 | 62.2 | 58.2 | 60.3 | 52.5 | 57.5 | 59.2 |
| Jedd | | 61.2 | 63.0 | 60.7 | 63.2 | 56.5 | 60.9 | 59.6 |
| IMICHT79 | | | | | 62.0 | 57.2 | 59.6 | 58.4 |
| WB Gunnison | | | | | 61.7 | 57.0 | 59.3 | 58.4 |
| SY Tyra | | | | | 64.6 | 57.0 | 60.8 | 58.4 |
| Kuntz | | 60.9 | 62.7 | 58.9 | 63.2 | 58.4 | 60.8 | 59.6 |
| McNeal | 56.1 | 58.7 | 61.9 | 59.0 | 58.7 | 55.4 | 58.3 | 59.2 |
| Mott | | | | 59.9 | 62.6 | 57.3 | 59.9 | 58.8 |
| ONeal | | 60.5 | 62.3 | 61.3 | 61.0 | 57.3 | 60.5 | 59.6 |
| Outlook | 54.9 | 59.0 | 62.7 | 58.6 | 59.1 | 54.3 | 58.1 | 59.2 |
| Reeder | 56.5 | 60.7 | 63.4 | 60.3 | 61.0 | 56.8 | 59.8 | 59.2 |
| Vida | 56.9 | 60.0 | 61.8 | 59.7 | 60.9 | 56.0 | 59.2 | 59.2 |
| Volt | | 61.5 | 63.0 | 61.7 | 62.9 | 57.5 | 61.3 | 59.6 |
| Mean | 56.43 | 60.01 | 62.54 | 60.2 | 61.65 | 56.2 | | |

Varieties with multi-year mean > than **Vida** for the same years are in **bold**.

Table 10 Geraldine multi-year spring wheat variety test weights.
Exp 9972 Central Agricultural Research Center. Moccasin, Montana.

| Variety | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | Average | Vida |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | | | | | | | | same Yrs |
| | | | | lbs/bu | | | | |
| AP604CL | | | 61.3 | 58.5 | 60.0 | 58.3 | 59.5 | 58.6 |
| Choteau | 59.3 | 61.4 | 59.9 | 57.1 | 58.8 | 59.5 | 59.3 | 59.1 |
| Corbin | 59.7 | 61.4 | 60.3 | 58.2 | 60.2 | 57.8 | 59.6 | 59.1 |
| Duclair | | | | 57.2 | 58.7 | 56.3 | 57.4 | 58.0 |
| Fortuna | 58.4 | 60.8 | 59.1 | 59.3 | 61.1 | 59.0 | 59.6 | 59.1 |
| Hank | 56.2 | 60.5 | 60.0 | 56.9 | 59.1 | 56.6 | 58.2 | 59.1 |
| IMICHT79 | | | | | 60.0 | 59.3 | 59.6 | 58.3 |
| Jedd | | 62.5 | 61.3 | 58.9 | 60.0 | 58.7 | 60.3 | 59.3 |
| Kuntz | | 60.5 | 60.6 | 57.4 | 60.0 | 60.6 | 59.8 | 59.3 |
| McNeal | 57.6 | 60.6 | 60.1 | 57.6 | 58.5 | 57.3 | 58.6 | 59.1 |
| Mott | | | | 58.6 | 61.3 | 59.2 | 59.7 | 58.0 |
| ONeal | | 62.0 | 61.7 | 59.6 | 60.2 | 58.7 | 60.4 | 59.3 |
| Outlook | 57.9 | 60.8 | 59.0 | 56.9 | 57.7 | 58.5 | 58.4 | 59.1 |
| Reeder | 59.8 | 62.2 | 60.7 | 59.1 | 59.3 | 58.8 | 60.0 | 59.1 |
| SY Tyra | | | | | 60.5 | 57.8 | 59.2 | 58.3 |
| Vida | 58.5 | 62.1 | 60.4 | 57.3 | 58.5 | 58.1 | 59.1 | 59.1 |
| Volt | | 62.3 | 62.7 | 60.2 | 62.2 | 60.3 | 61.5 | 59.3 |
| WB Gunnison | | | | | 59.9 | 58.5 | 59.2 | 58.3 |
| Mean | 59.05 | 61.31 | 60.62 | 58.48 | 59.88 | 58.5 | | |

Varieties with multi-year mean > than **Vida** for the same years are in **bold**.

Table 11 Moccasin multi-year spring wheat cultivar protein content in CC no-till. Central Agricultural Research Center. Moccasin, Montana.

| Variety | | | | | | | Vida | |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | average | Same Year |
| | % | % | % | % | % | % | | % |
| AP604 CL | | | 17.8 | 12.9 | 15.1 | 19.2 | 16.3 | 15.3 |
| Choteau | 14.6 | 14.8 | 17.6 | 12.6 | 15.8 | 17.3 | 15.5 | 14.8 |
| Corbin | 15.9 | 14.6 | 18.1 | 12.8 | 14.6 | 18.6 | 15.8 | 14.8 |
| Duclair | | | | 13.2 | 14.8 | 17.4 | 15.1 | 14.6 |
| Fortuna | 14.9 | 14.5 | 16.2 | 12.7 | 15.8 | 18.2 | 15.4 | 14.8 |
| Hank | 15.8 | 13.5 | 18.5 | 12.6 | 15.4 | 19.1 | 15.8 | 14.8 |
| IMICHT79 | | | | | 16.2 | 17.9 | 17.1 | 16.1 |
| Jedd | | 13.5 | 17 | 13.4 | 14.2 | 18.7 | 15.4 | 14.8 |
| Kuntz | | 13.7 | 15.7 | 12.8 | 14.6 | 18.5 | 15.1 | 14.8 |
| McNeal | 15.1 | 14.6 | 17.5 | 12.9 | 16.2 | 18.2 | 15.8 | 14.8 |
| Mott | | | | 13.7 | 15.4 | 19.3 | 16.1 | 14.6 |
| ONeal | | 13.7 | 17.3 | 12.9 | 15.0 | 18.8 | 15.5 | 14.8 |
| Outlook | 14.5 | 13.2 | 16.3 | 12.0 | 15.2 | 15.9 | 14.5 | 14.8 |
| Reeder | 14.9 | 14.2 | 16.3 | 12.4 | 15.5 | 17.5 | 15.1 | 14.8 |
| SY Tyra | | | | | 15.4 | 18.3 | 16.9 | 16.1 |
| Vida | 14.9 | 12.8 | 17.4 | 11.7 | 14.8 | 17.3 | 14.8 | 14.8 |
| Volt | | 13.9 | 16 | 13.7 | 13.8 | 18.1 | 15.1 | 14.8 |
| WB Gunnison | | | | | 15.4 | 18.3 | 16.9 | 16.1 |
| Means | 15.26 | 14.06 | 16.94 | 12.88 | 15.27 | 18.1 | | |

Varieties with multi-year mean > than **Vida** for the same years are in **bold**.

Table 12 Denton multi-year spring wheat cultivar protein content in CC no-till. Central Agricultural Research Center. Moccasin, Montana.

| Pedigree | | | | | | | Vida | |
|-------------|-------------|-------------|-------------|-------------|-------------|-------|-------------|-------------|
| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | Average | Same Yrs. |
| | % | | | | | | | |
| AP604CL | | | 14.8 | 14.2 | 14.1 | 16.6 | 14.9 | 13.7 |
| Choteau | 15.5 | 14.5 | 15.0 | 13.9 | 14.6 | 14.9 | 14.7 | 13.7 |
| Corbin | 14.7 | 13.9 | 14.6 | 13.3 | 13.9 | 16.1 | 14.4 | 13.7 |
| Duclair | | | | 13.5 | 13.6 | 15.6 | 14.2 | 13.6 |
| Fortuna | 17.0 | 14.6 | 14.6 | 13.2 | 14.6 | 14.7 | 14.8 | 13.7 |
| Hank | 15.0 | 13.3 | 13.3 | 13.7 | 13.2 | 16.5 | 14.2 | 13.7 |
| IMICHT79 | | | | | 13.4 | 15.0 | 14.2 | 13.9 |
| Jedd | | 13.2 | 13.4 | 13.3 | 13.8 | 15.8 | 13.9 | 13.6 |
| Kuntz | | 12.4 | 13.4 | 12.9 | 12.2 | 15.7 | 13.3 | 13.6 |
| McNeal | 15.3 | 13.9 | 14.2 | 13.2 | 14.2 | 15.8 | 14.4 | 13.7 |
| Mott | | | | 14.1 | 14.0 | 16.9 | 15.0 | 13.6 |
| ONeal | | 13.7 | 13.7 | 13.1 | 13.8 | 15.5 | 14.0 | 13.6 |
| Outlook | 15.3 | 12.8 | 13.8 | 12.9 | 13.4 | 14.9 | 13.9 | 13.7 |
| Reeder | 15.2 | 12.7 | 14.3 | 13.5 | 14.3 | 15.1 | 14.2 | 13.7 |
| SY Tyra | | | | | 12.4 | 15.1 | 13.8 | 13.9 |
| Vida | 14.2 | 13.1 | 13.9 | 13.1 | 12.6 | 15.2 | 13.7 | 13.7 |
| Volt | | 13.0 | 13.4 | 12.9 | 12.7 | 16.0 | 13.6 | 13.6 |
| WB Gunnison | | | | | 13.2 | 15.5 | 14.4 | 13.9 |
| Mean | 15.1 | 13.6 | 14.4 | 13.43 | 13.7 | 15.41 | | |

Varieties with multi-year mean > than **Vida** for the same years are in **bold**.

Table 13 Multi-Year spring wheat cultivar protein content near Geraldine.
Exp 997210 Central Agricultural Research Center. Moccasin, Montana.

| Variety | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | Average | Vida |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | | | | | | | | Same Yrs |
| | | | | % | | | | |
| AP604CL | | | 14.1 | 15.2 | 15.6 | 17.1 | 15.5 | 14.7 |
| Choteau | 15.4 | 11.8 | 14.3 | 15.1 | 16.5 | 16.4 | 14.9 | 14.3 |
| Corbin | 14.7 | 11.5 | 14.3 | 14.9 | 14.5 | 16.5 | 14.4 | 14.3 |
| Duclair | | | | 14.3 | 14.8 | 17.0 | 15.4 | 15.2 |
| Fortuna | 16.5 | 11.4 | 14.5 | 14.7 | 14.2 | 16.5 | 14.6 | 14.3 |
| Hank | 15.7 | 11.1 | 13.6 | 15.1 | 14.3 | 16.8 | 14.4 | 14.3 |
| IMICHT79 | | | | | 14.9 | 16.5 | 15.7 | 15.9 |
| Jedd | | 10.5 | 13.6 | 14.6 | 14.6 | 16.9 | 14.0 | 14.1 |
| Kuntz | | 11.3 | 13.4 | 14.0 | 13.6 | 16.4 | 13.7 | 14.1 |
| McNeal | 16.2 | 12.0 | 14.7 | 14.8 | 14.6 | 17.6 | 15.0 | 14.3 |
| Mott | | | | 15.4 | 14.2 | 17.2 | 15.6 | 15.2 |
| ONeal | | 10.8 | 13.6 | 14.5 | 14.9 | 16.7 | 14.1 | 14.1 |
| Outlook | 15.0 | 11.8 | 14.8 | 14.1 | 15.3 | 15.9 | 14.5 | 14.3 |
| Reeder | 15.3 | 11.7 | 14.0 | 15.2 | 14.4 | 16.4 | 14.5 | 14.3 |
| SY Tyra | | | | | 13.9 | 16.7 | 15.3 | 15.9 |
| Vida | 15.4 | 11.7 | 13.4 | 13.8 | 15.5 | 16.2 | 14.3 | 14.3 |
| Volt | | 11.9 | 13.5 | 13.5 | 13.8 | 17.5 | 14.0 | 14.1 |
| WB Gunnison | | | | | 14.6 | 16.7 | 15.7 | 15.9 |
| Mean | 15.42 | 11.56 | 14.25 | 14.67 | 14.77 | 16.71 | | |

Varieties with multi-year means > than **Vida** for the same years are in **bold**.