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# Land Value Trends

November, 2012 | Third Quarter 2012

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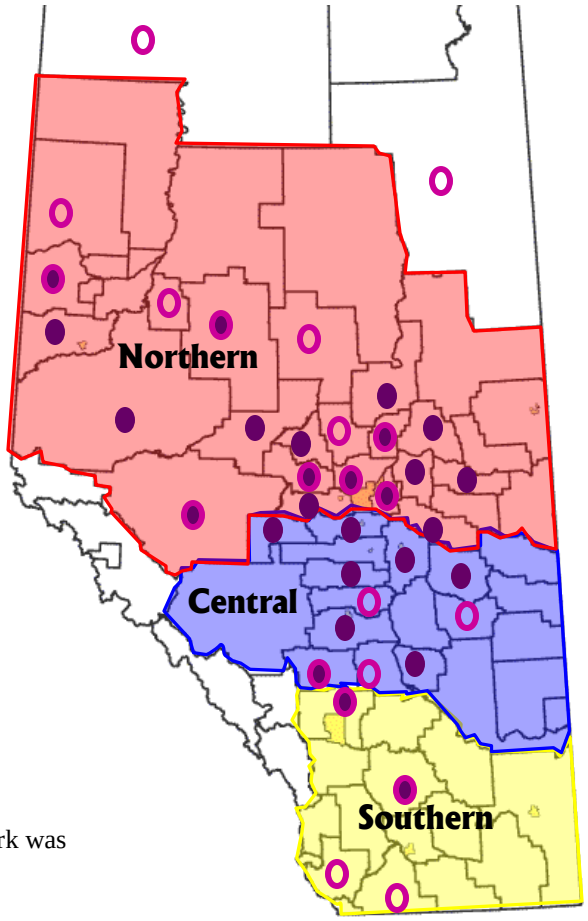
We have now prepared the sale information to complete our general market analysis for the Third Quarter of 2012 (July - September). The following map illustrates the locations where data has been obtained. The Q3, 2012 sales are summarized individually in the tables on the following page. Our Regional Analysis and Cultivation Comparison are also included on the following pages.

The results of this quarter's analysis are mixed. Some averages showed a minor decline, while others showed an increase. However, appraisal work that we have completed suggests that generally there is strength in the agricultural land market in all regions of Alberta. Therefore, for this newsletter, our article discusses the methodology behind some new analyses that we are incorporating into our newsletter. This includes an analysis of the sales distribution, and a more detailed trend analysis. It is hoped that these analyses will provide a better indication of the actual change in land values with less variation attributed to the random aspect of the sale data.

### Regional Analysis
**Map of Area Divisions**




O Indicates municipalities in which appraisal work was completed during Q3, 2012.

● Indicates municipalities in which we have obtained information on at least one sale that occurred during Q3, 2012.

# Sale Summary

## Third Quarter (July - September) 2012

### Bareland Sales

| Northern Alberta – Q3 | | | | |
|---|---|---|---|---|
| Municipality | Sale Price | Acres | $/acre | Primary Land Use |
| Athabasca | $85,000 | 89.00 | $955 | Bush |
| Barrhead | $287,500 | 150.00 | $1,917 | Bush |
| Beaver | $130,000 | 156.56 | $830 | Cultivated, Bush |
| Beaver | $286,200 | 159.00 | $1,800 | Pasture, Bush |
| Big Lakes | $110,000 | 160.00 | $688 | Hay, Bush |
| Grande Prairie | $160,000 | 159.00 | $1,006 | Bush |
| Grande Prairie | $1,000,000 | 161.00 | $6,211 | Urban Influence |
| Grande Prairie | $257,000 | 150.00 | $1,713 | Bush, Cultivated |
| Grande Prairie | $359,000 | 160.00 | $2,244 | Cultivated |
| Grande Prairie | $206,000 | 151.53 | $1,359 | Hay, Bush |
| Greenview | $75,000 | 137.04 | $547 | Pasture |
| Lac Ste. Anne | $199,900 | 79.41 | $2,517 | Pasture, Bush |
| Lamont | $138,500 | 160.00 | $866 | Bush |
| Lamont | $275,000 | 160.00 | $1,719 | Cultivated, Pasture, Hay |
| Lamont | $102,500 | 80.00 | $1,281 | Bush |
| Mackenzie | $31,000 | 159.00 | $195 | Bush |
| Northern Lights | $95,000 | 160.00 | $594 | Bush, Hay |
| Northern Lights | $100,000 | 160.00 | $625 | Bush, Cultivated |
| Northern Lights | $100,000 | 160.00 | $625 | Bush, Cultivated |
| Northern Lights | $145,000 | 130.00 | $1,115 | Cultivated |
| Parkland | $469,000 | 156.00 | $3,006 | Cultivated, Hay |
| Saddle Hills | $170,000 | 157.97 | $1,076 | Cultivated, Bush |
| Smoky Lake | $65,000 | 79.50 | $818 | Hay, Pasture |
| Smoky Lake | $45,000 | 70.00 | $643 | Bush |
| Smoky Lake | $222,600 | 84.11 | $2,647 | Water Frontage, Bush |
| Smoky Lake | $108,000 | 161.00 | $671 | Bush, Pasture |
| Starland | $350,000 | 480.00 | $729 | Pasture |
| Strathcona | $845,000 | 80.17 | $10,540 | Urban Influence |
| Strathcona | $415,000 | 78.00 | $5,321 | Pasture, Bush |
| Sturgeon | $265,000 | 77.83 | $3,405 | Bush |
| Sturgeon | $180,000 | 82.51 | $2,182 | Bush, Pasture |
| Sturgeon | $400,400 | 77.62 | $5,158 | Cultivated |
| Sturgeon | $525,000 | 80.00 | $6,563 | Bush |
| Thorhild | $200,000 | 77.60 | $2,577 | Cultivated, Bush |
| Thorhild | $135,000 | 148.95 | $906 | Pasture, Bush |
| Thorhild | $190,000 | 155.15 | $1,225 | Bush |
| Thorhild | $107,000 | 161.00 | $665 | Bush, Pasture |
| Thorhild | $247,000 | 143.00 | $1,727 | Cultivated |
| Two Hills | $90,000 | 79.44 | $1,133 | Pasture, Bush |
| Two Hills | $170,000 | 148.00 | $1,149 | Hay, Bush |
| Two Hills | $180,000 | 160.00 | $1,125 | Hay |
| Woodlands | $115,500 | 155.47 | $743 | Bush, Cultivated |
| Yellowhead | $182,000 | 160.00 | $1,138 | Bush |
| Yellowhead | $142,000 | 157.97 | $899 | Bush |

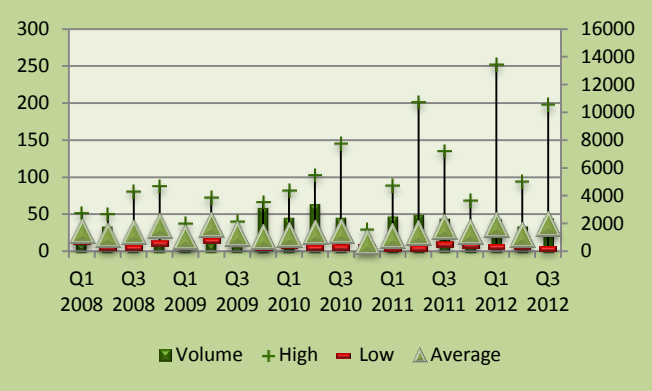
| Central Alberta – Q3 | | | | |
|---|---|---|---|---|
| Municipality | Sale Price | Acres | $/acre | Land Use |
| Brazeau | $235,000 | 158.02 | $1,487 | Bush |
| Brazeau | $235,000 | 144.90 | $1,622 | Hay |
| Brazeau | $235,000 | 158.02 | $1,487 | Bush |
| Brazeau | $235,000 | 144.90 | $1,622 | Hay |
| Camrose | $310,000 | 119.00 | $2,605 | Cultivated, Hay |
| Camrose | $330,000 | 107.00 | $3,084 | Cultivated, Hay |
| Clearwater | $196,505 | 121.00 | $1,624 | Bush, Pasture |
| Clearwater | $229,500 | 61.87 | $3,709 | Cultivated |
| Leduc | $210,000 | 80.00 | $2,625 | Bush |
| Leduc | $242,500 | 120.00 | $2,021 | Cultivated |
| Leduc | $255,000 | 131.00 | $1,947 | Pasture |
| Leduc | $315,000 | 149.50 | $2,107 | Hay |
| Leduc | $350,000 | 153.00 | $2,288 | Cultivated |
| Leduc | $5,000,000 | 137.61 | $36,335 | Urban Influence |
| Mountain View | $790,000 | 156.01 | $5,064 | Urban Influence |
| Mountain View | $317,500 | 75.86 | $4,185 | Cultivated |
| Mountain View | $427,500 | 159.00 | $2,689 | Pasture |
| Mountain View | $397,500 | 150.00 | $2,650 | Hay, Cultivated |
| Mountain View | $415,000 | 160.00 | $2,594 | Pasture |
| Mountain View | $475,000 | 160.00 | $2,969 | Hay |
| Mountain View | $430,000 | 122.00 | $3,525 | Pasture, Bush |
| Mountain View | $425,000 | 146.00 | $2,911 | Pasture, Bush |
| Mountain View | $425,000 | 139.00 | $3,058 | Hay, Pasture |
| Ponoka | $220,000 | 160.00 | $1,375 | Pasture, Bush |
| Ponoka | $220,000 | 160.00 | $1,375 | Pasture, Bush |
| Ponoka | $205,000 | 140.00 | $1,464 | Pasture |
| Ponoka | $230,000 | 150.00 | $1,533 | Pasture |
| Ponoka | $235,000 | 140.00 | $1,679 | Pasture |
| Ponoka | $240,000 | 160.00 | $1,500 | Hay, Bush |
| Ponoka | $330,000 | 159.98 | $2,063 | Water Frontage, Hay |
| Red Deer | $505,000 | 160.00 | $3,156 | Water Frontage, Bush |
| Red Deer | $200,000 | 136.75 | $1,463 | Pasture |
| Red Deer | $227,500 | 120.21 | $1,893 | Cultivated, Pasture |
| Stettler | $215,000 | 322.00 | $668 | Pasture, Hay |
| Wetaskiwin | $222,000 | 80.00 | $2,775 | Hay |

| Southern Alberta – Q3 | | | | |
|---|---|---|---|---|
| Municipality | Sale Price | Acres | $/acre | Land Use |
| Foothills | $3,000,000 | 320.32 | $9,366 | Recreation |
| Lethbridge | $300,000 | 160.00 | $1,875 | Cultivated |
| Newell | $150,000 | 160.00 | $938 | Cultivated |
| Newell | $1,125,000 | 279.50 | $3,846 | Irrigated; incl. house |
| Rockyview | $1,000,000 | 157.57 | $6,346 | Pasture |
| Rockyview | $700,000 | 160.00 | $4,375 | Pasture, Bush |
| Rockyview | $580,000 | 156.00 | $3,718 | Cultivated, Pasture |
| Rockyview | $815,000 | 158.97 | $5,127 | Hay, Pasture |
| Rockyview | $1,000,000 | 157.57 | $6,346 | Pasture |
| Vulcan | $2,341,077 | 946.50 | $2,473 | Cultivated |
| Vulcan | $137,375 | 157.03 | $875 | Hay, Pasture |
| Vulcan | $700,000 | 317.75 | $2,203 | Pasture, Cultivated |
| Wheatland | $480,000 | 79.30 | $6,053 | Cultivated |
| Willow Creek | $255,000 | 155.00 | $1,645 | Cultivated |

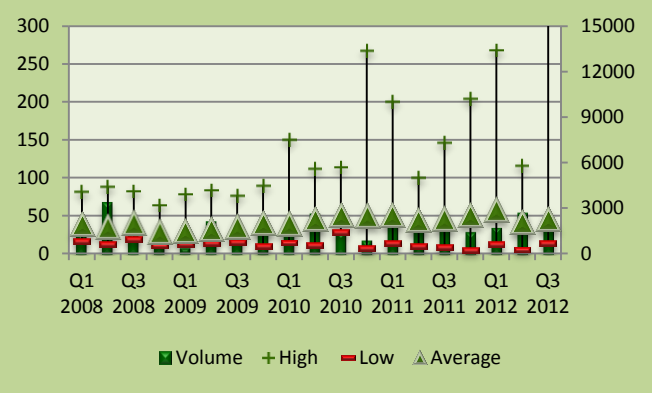
# Regional Analysis

In the following graphs we have excluded sales that we believe are expected to have significant urban influence.

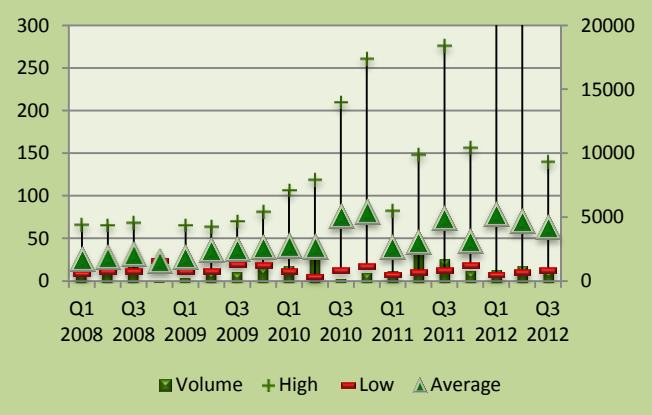
### Graph 1: Northern Alberta



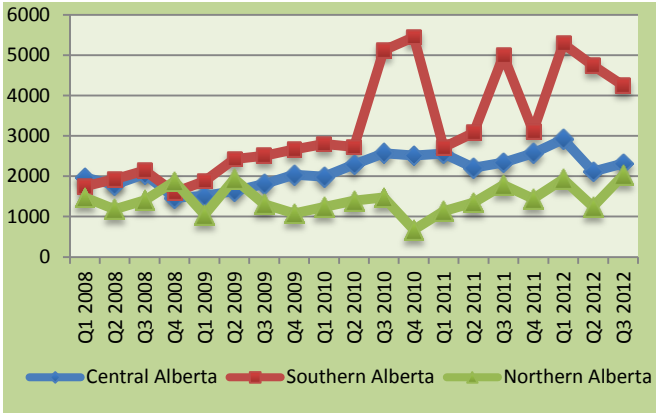

### Graph 2: Central Alberta




### Graph 3: Southern Alberta



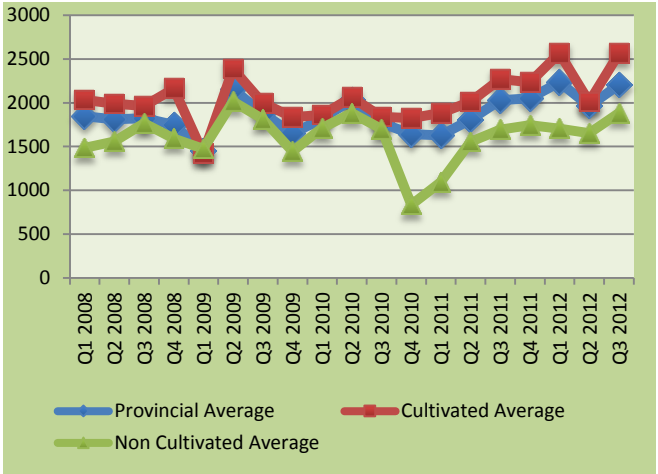

### Graph 4: Average Value of Each Region



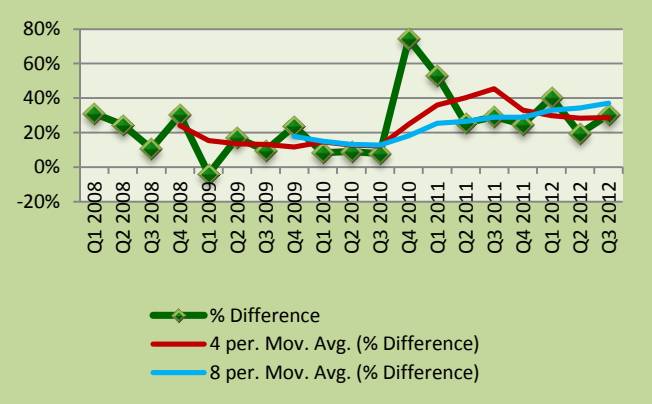

Within each of the above regions, there are areas with different agricultural productivity. There is also variation with respect to regional population, urban development, or demand for country residential properties. Therefore, there is frequently a wide difference between the range of high and low values per acre.

# Cultivated vs Uncultivated Comparison

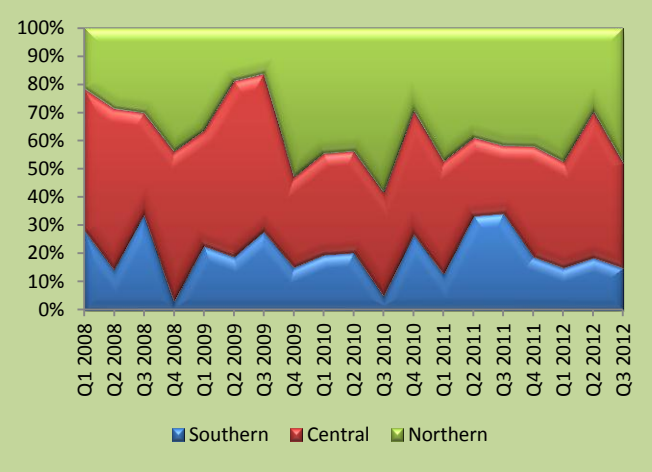
### Graph 5: Provincial Cultivated vs Uncultivated



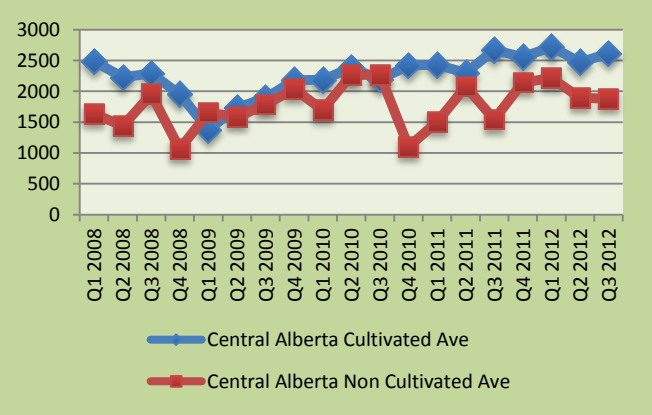
**Graph 6: Percent Difference : Cultivated vs Uncultivated Land**



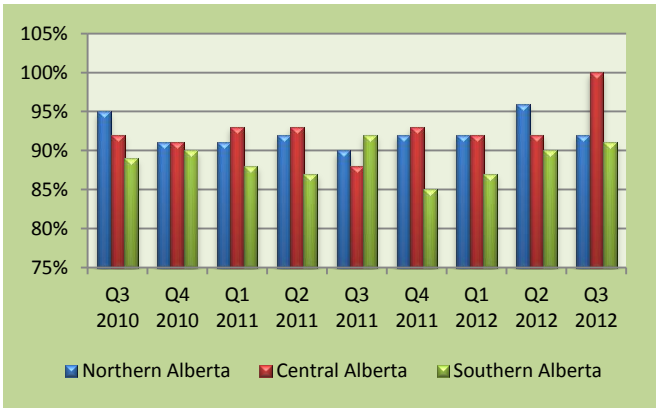

**Graph 7: Proportion of Sales by Region**




**Graph 8: Central Alberta - Cultivated vs Uncultivated**




**Graph 9: Sale Price : List Price**




Given the limited arm's-length sales data and variable information available in the rural real estate market, it is often difficult to determine trends and quantify time adjustments in the market for agricultural properties. Therefore, the information contained in this newsletter should not be relied upon solely for purchasing or financing decisions. It is prepared with the intent of providing a general indication of the activity in the rural real estate market. If an estimate of value is required for specific properties, it is recommended that an appraisal be obtained. Benchmark studies can also be completed if approximate land values are required for a specific area.

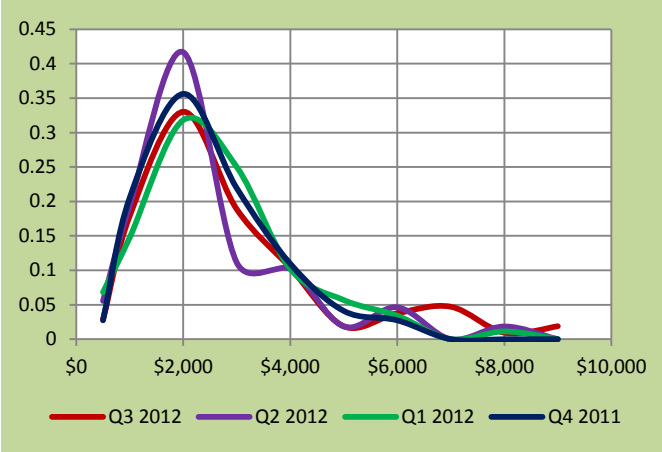
# Additional Sale And Trend Analysis

Through previous newsletters we have used current sales data to estimate average values. However, as illustrated in the newsletter graphs there can be significant variability in average values between individual quarters. As part of the analysis we have occasionally been able to identify factors that contributed to the variability, including outlying sales that may not be typical for the area, or variation in the usual distribution of sales (including location or land use). As part of this newsletter we have attempted to introduce a more comprehensive analysis of sales data. This includes an analysis of the sale distribution and trend analysis. The following is an explanation of the methodology we will attempt to incorporate into future newsletters.

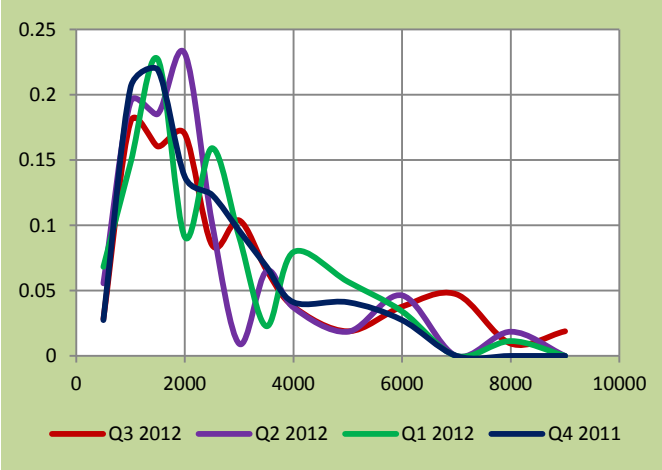
# Sale Distribution

The following graph shows the frequency of distribution of the quarterly sales data.

**Graph 10: Frequency Distribution by $1,000**



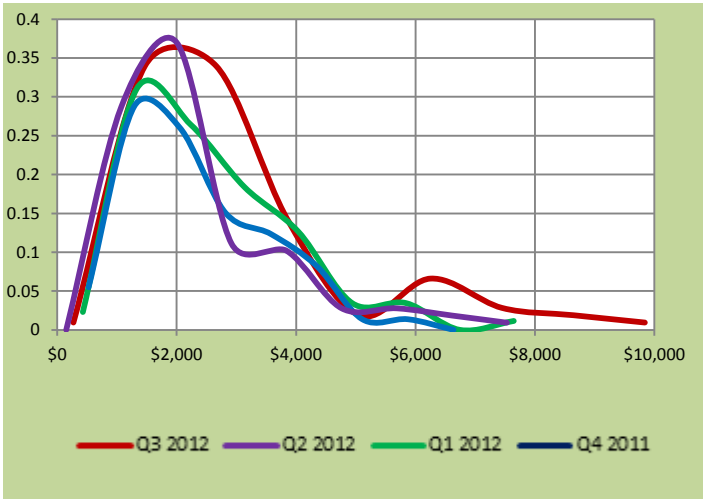

**Graph 11: Frequency Distribution by $500**




The above graphs shows that over the past four quarters there has been a relatively similar pattern to the frequency of sales data. Most of the sales have been within the range of $1,500 - $2,000 per acre, with the widest variation in the frequency occurring in the sales around ±2,500 - $3,000 per acre

Although the following graph is generally similar to the preceding one, the sales frequency has been centred about the mean average and distributed using the standard deviation rather than using the same distinct grouping.

**Graph 12: Distribution of Sales using Standard Deviation**




The above graph shows that in the last two quarters the mean average has been higher than in preceding quarters. However, for Q3, 2012, there was a much wider deviation than in preceding quarters, possibly due to more sales towards the upper end of the range of values.

# Time Series Analysis

The second analysis considers that there are three components to a time series:

Seasonal Variation, Random Variation, and the Trend
To estimate a change in land values over time, it is desired to isolate the trend in the time series of average land values.

Therefore, the following analysis considers if it may be possible to identify the trend separately from the remaining components of the time series.

### Seasonal Variation

To identify possible variation in average land values due to seasonal patterns, a four period moving average is centred on each quarter. This is achieved by averaging two

consecutive moving averages. The following table shows the values used in this estimate.

### Table 1: Calculation of Centred Moving Average

| Year | Quarter | Individual Quarter Actual Average | 4 Period Moving Average | Centred Moving Average |
|---|---|---|---|---|
| 2008 | Q1 | $1,846 | | |
| | Q2 | $1,809 | | |
| | | | $1,808 | |
| | Q3 | $1,825 | | $1,758 |
| | | | $1,709 | |
| | Q4 | $1,750 | | $1,752 |
| | | | $1,796 | |
| 2009 | Q1 | $1,452 | | $1,802 |
| | | | $1,809 | |
| | Q2 | $2,155 | | $1,796 |
| | | | $1,784 | |
| | Q3 | $1,879 | | $1,829 |
| | | | $1,875 | |
| | Q4 | $1,648 | | $1,859 |
| | | | $1,844 | |
| 2010 | Q1 | $1,816 | | $1,830 |
| | | | $1,817 | |
| | Q2 | $2,032 | | $1,816 |
| | | | $1,815 | |
| | Q3 | $1,770 | | $1,792 |
| | | | $1,768 | |
| | Q4 | $1,642 | | $1,740 |
| | | | $1,712 | |
| 2011 | Q1 | $1,629 | | $1,745 |
| | | | $1,777 | |
| | Q2 | $1,808 | | $1,828 |
| | | | $1,880 | |
| | Q3 | $2,028 | | $1,955 |
| | | | $2,031 | |
| | Q4 | $2,053 | | $2,050 |
| | | | $2,070 | |
| 2012 | Q1 | $2,233 | | $2,106 |
| | | | $2,142 | |
| | Q2 | $1,965 | | n/a |
| | | | n/a | |
| | Q3 | $2,318 | | n/a |

The deviation of individual quarterly values from the centred moving average is then calculated.

### Table 2: Deviation of Actual Data from Moving Average

| Year | Quarter | Individual Quarter Actual Average (QAA) | Centred Moving Average (CMA) | Deviation (QAA/CMA) (% of CMA) |
|---|---|---|---|---|
| 2008 | Q1 | $1,846 | | |
| | Q2 | $1,809 | | |
| | Q3 | $1,825 | $1,758 | 104% |
| | Q4 | $1,750 | $1,752 | 100% |
| 2009 | Q1 | $1,452 | $1,802 | 81% |
| | Q2 | $2,155 | $1,796 | 120% |
| | Q3 | $1,879 | $1,829 | 103% |
| | Q4 | $1,648 | $1,859 | 89% |
| 2010 | Q1 | $1,816 | $1,830 | 99% |
| | Q2 | $2,032 | $1,816 | 112% |
| | Q3 | $1,770 | $1,792 | 99% |
| | Q4 | $1,642 | $1,740 | 94% |
| 2011 | Q1 | $1,629 | $1,745 | 93% |
| | Q2 | $1,808 | $1,828 | 99% |
| | Q3 | $2,028 | $1,955 | 104% |
| | Q4 | $2,053 | $2,050 | 100% |
| 2012 | Q1 | $2,233 | $2,106 | 106% |
| | Q2 | $1,965 | n/a | n/a |
| | Q3 | $2,318 | n/a | n/a |

The following table summarizes the deviation for each quarter.

### Table 3: Summary of Deviation

| | Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|---|
| 2008 | | | 104% | 100% |
| 2009 | 81% | 120% | 103% | 89% |
| 2010 | 99% | 112% | 99% | 94% |
| 2011 | 93% | 99% | 104% | 100% |
| 2012 | 106% | | | |
| Average | 95% | 110% | 102% | 94% |

Although the above table shows variation in the average deviation quarter to quarter, there is not a consistent pattern year to year for each quarter. Therefore, it is expected that there is not a seasonal pattern to agricultural land values. However, the table above is based on a relatively limited time period. Therefore, we have referred to additional historic information within our database of sales. This database is updated as new sales are available. Therefore, the deviation for individual quarters in recent years may be different than in the table above.

**Table 4: Deviation of Actual Data from Moving Average (2002 – Present)**

| | Deviation of Data Point from Quarterly Average | | | | Sample Size | | | |
|---|---|---|---|---|---|---|---|---|
| | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 2002 | | | 130% | 86% | 81 | 102 | 61 | 55 |
| 2003 | 97% | 113% | 92% | 90% | 78 | 117 | 60 | 59 |
| 2004 | 109% | 82% | 125% | 104% | 60 | 129 | 58 | 115 |
| 2005 | 96% | 76% | 98% | 125% | 105 | 175 | 106 | 156 |
| 2006 | 87% | 95% | 112% | 116% | 284 | 333 | 231 | 176 |
| 2007 | 82% | 77% | 137% | 99% | 216 | 262 | 154 | 117 |
| 2008 | 86% | 111% | 114% | 64% | 174 | 162 | 107 | 97 |
| 2009 | 105% | 97% | 101% | 118% | 106 | 189 | 123 | 122 |
| 2010 | 95% | 99% | 81% | 119% | 176 | 214 | 111 | 116 |
| 2011 | 100% | 78% | 132% | 94% | 127 | 139 | 68 | 76 |
| Average | **95%** | **92%** | **110%** | **103%** | **141** | **182** | **108** | **109** |

The variation within each distinct quarter of the above table supports our initial ascertain that there is not expected to be seasonal variation in agricultural land values. Therefore, the variation of actual data for individual quarters is expected to be attributed to the random component of the time series.

### Random Variation

Based on the data in Table 3, there is an average quarterly variance of up to 10% per quarter. However, the variance of individual data points is much greater (up to 37%). Because there is not considered to be any seasonal pattern to land value trends, this variance is expected to be attributed to random variation.

From the individual data points for each quarter, the mean deviation is approximately 0.58%, but the standard deviation is approximately 17%. This indicates that despite a relatively large sample size, there is still substantial variation attributed to the random aspect of the data series. Therefore, to achieve 95% confidence that the average land value is within a specified range of values, individual data points would need to indicate a range of approximately ±33%, to account for the potential random variance. However, this is much larger than the actual expected change in value due to the trend. Therefore, any possible trend would be masked by the potentially large range of values.

# Trend Analysis

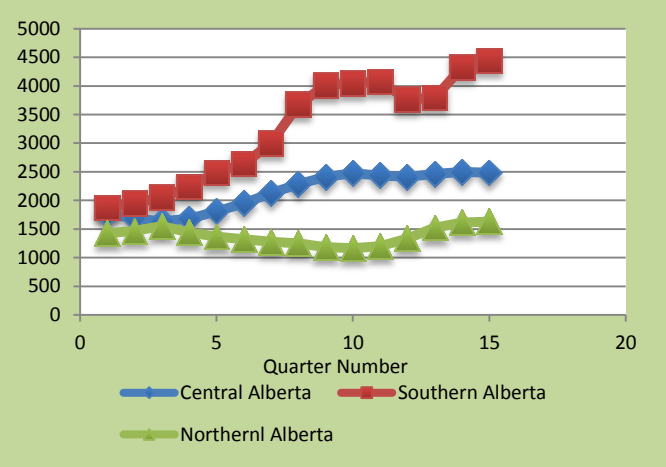
Because it is not considered feasible to apply a range of values to individual data points to account for random variation, the most effective way to estimate the trend is considered to be using the centred moving average, that was previously calculated.

By using this average the potential for the data to become skewed due to random variation is reduced. However, this method is less effective at identifying changes to an existing trend, because more historic data is included in the average. In other words, the individual data points are less responsive to changes in the trend, because of the influence that more dated sales have on the average value. Therefore, this method is expected to be more effective at identifying long term or historic trends.

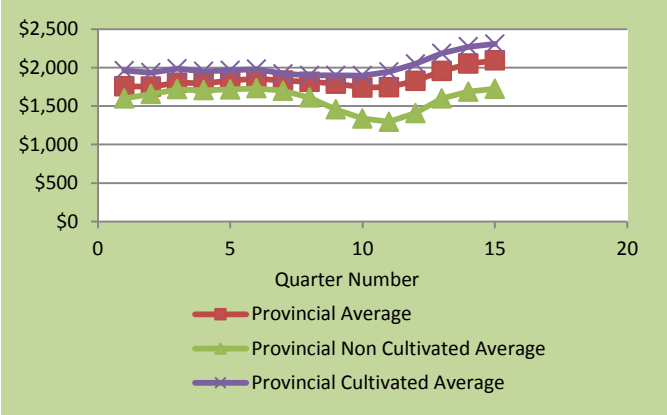
Although a weighted moving average may be used to increase the reliance on more recent data, it also exposes the estimate to more potential variation due to the random variation of the most recent quarter.

Graphs 13 and 14 show the centred moving average values included in the front part of the newsletter.

**Graph 13: Centred Moving Average of Regional Analyses**



**Graph 14: Centred Moving Average of Cultivation Comparison**



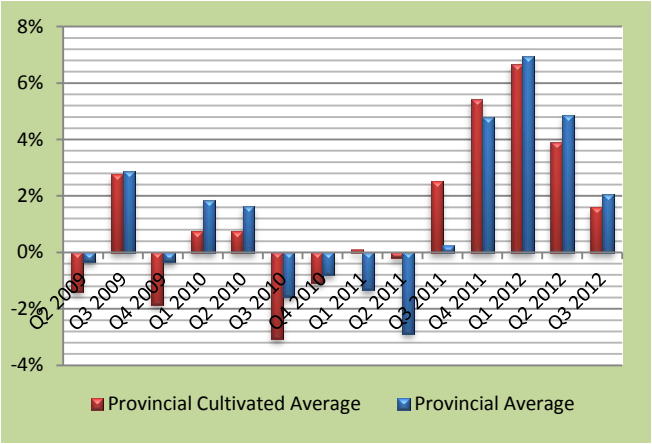

Based on the graphs above, a possible trend in land values may be more identifiable.

Graph 13 suggests that the strongest increases in value have occurred in Southern Alberta. However, Central Alberta has maintained a relatively consistent upward trend in values.

The analysis of sales of cultivated land shows that despite a time of relatively flat values, over recent periods a strong increase has been evident. Non-cultivated land values appear to have experienced a period of noticeable decline, with a strong movement upwards during recent quarters.

The following graph shows the quarterly percent differences between the moving averages indicated in the graph above.

**Graph 15: Percent Difference in Land Values**




Therefore, the most recent sales data suggests that provincial average land values have increased by approximately 2% in the last quarter, 6% to 7% during the last six months, and possibly 17% to 18% over the past year. However, the reliability of these results is subject to the limitations that were previously identified.