

# Global Farmland Primer

## Investment Opportunities in Farmland

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## Long-Term Appreciation of Farmland; The Emergence of a New Asset Class

- Farm values rising with high farmer income, arable land scarcity.**  
 We believe we are in the 3<sup>rd</sup> or 4<sup>th</sup> inning of a farmland price appreciation cycle driven by high farmer income and arable land scarcity.
- Farmland as an investment is a great hedge against inflation.**  
 Past two periods of high inflation have seen farm values dramatically beat financial assets; believe this could be another multi-year period of same.
- Water availability, soil quality can positively impact farm value.**  
 High quality land can result in lower cost of inputs (fertilizer) and higher quantity of outputs (yield) driving farmer income and in turn, land prices.
- Favorite areas: select parts of South America, East Europe, Canada.**  
 We seek farmland in stable & open regimes w/ easy access to water and labour at reasonable prices; not many options, believe more will emerge.

## WWCM Global Farmland Comparables

In US\$ unless otherwise noted Company Name	Bloomberg Ticker	Share Price	Shares o/s (mm)	Mkt Cap. (\$mm)	EV (\$mm)	Primary Country	IPO			% Of Raised Proceeds invested	Price/NAV	EV/EBITDA		
							Date	Price	Return Since IPO			F08E	F09E	
<b>South America</b>														
NZ Farming Systems	NZS NZ	\$1.14	244	\$278	\$245	Uruguay	12/18/2007	\$1.13	1%	75%	1.2x	n/a	18.9x	
SLC Agricola SA	SLCE3 BZ	\$15.14	103	\$1,558	\$1,393	Brazil	6/14/2007	\$7.26	109%	60%	4.5x	16.2x	15.1x	
BrasilAgro	AGRO3 BZ	\$6.23	58	\$364	\$210	Brazil	2/15/2006	\$4.83	29%	41%	1.0x	n/a	68.7x	
Cresud Inc	CRES AR	\$1.15	501	\$574	\$404	Argentina	30/08/2002*	\$0.50	129%	n/a	1.0x	32.9x	33.7x	
Union Agriculture	n/a	\$1.40	54	\$75	\$75	Uruguay	n/a	n/a	n/a	0%	1.1x	n/a	n/a	
<b>South America Average**</b>										<b>59%</b>	<b>1.1x</b>	<b>24.5x</b>	<b>22.6x</b>	
<b>Eastern Europe/Russia</b>														
Agrowill Group AB	AVG1L LH	\$2.77	26	\$72	\$110	Lithuania	4/2/2008	\$2.26	22%	n/a	3.4x	n/a	n/a	
Black Earth Farming Ltd.	BEFSDB SS	\$4.68	124	\$583	\$358	Russia	12/25/2007	\$7.92	-41%	37%	1.3x	14.8x	4.5x	
Landkom International	LKI LN	\$1.17	200	\$234	\$150	Ukraine	11/22/2007	\$1.07	9%	11%	1.7x	n/a	11.6x	
KTG Agrar	7KT GR	\$23.43	4	\$101	\$137	Germany	11/15/2007	\$25.62	-9%	n/a	2.4x	7.0x	6.1x	
Trigon Agri	TAGR SS	\$1.59	130	\$206	\$105	Russia	5/17/2007	\$1.68	-6%	14%	2.0x	6.0x	1.5x	
OAO Razgulay Group	GRAZ RU	\$6.79	120	\$815	\$1,274	Russia	11/21/2005	\$3.59	89%	52%	1.2x	6.9x	5.6x	
<b>Eastern Europe/Russia Average**</b>										<b>28%</b>	<b>1.7x</b>	<b>8.7x</b>	<b>6.9x</b>	
<b>North America</b>														
Wild Horse Group	n/a	\$0.85	30	\$26	\$21	Canada	n/a	n/a	n/a	0%	1.4x	n/a	n/a	
<b>North America Average</b>										<b>n/a</b>	<b>1.4x</b>	<b>n/a</b>	<b>n/a</b>	
<b>Entire Universe Average**</b>										<b>41%</b>	<b>1.4x</b>	<b>15.5x</b>	<b>13.6x</b>	

\*\* Excluding boxed outliers

Source: WWCM, Company reports, Consensus Estimates

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## Investment Summary and Outlook

**We believe we are in the third or fourth inning of a significant farmland price appreciation cycle resulting from high farmer income combined with scarce arable land.** In the last farmland appreciation cycle, higher farmer income for a multi-year period resulted in a longer-term rise in farmland values. Higher farm income has raised the demand for farmland, pulling the farmland prices up by 31% in the U.S. since 2005. This steadily rising demand for land has now been coupled with rapidly shrinking arable land per person on a global scale, creating what we view as conditions for a potentially decade-long period of farmland price outperformance.

**In addition to value appreciation, farmland can provide investors with an excellent hedge against inflation.** In the past two periods of high inflation, farmland price appreciation significantly outperformed financial assets. The only two times since 1913 that CPI inflation has averaged ~10% for three years (or longer) were times when financial assets performed poorly, and farmland values showed significant gains. As shown in Exhibit 1, farmland prices appreciated 15.8% y/y in the late 1970's versus the Dow Jones Industrial Average, which was essentially flat at 0.4% y/y growth. For investors who believe governments are having to reflate their economies, thereby leading to a period of higher inflation, farmland does appear to have several historic precedents of outperformance.

### Exhibit 1: Farmland Price Appreciation Outperforming Financial Assets in Inflationary Periods

	CAGR	
	1944-1947	1975-1981
CPI	11.0%	9.2%
Dow Jones	-3.1%	0.4%
Farmland	13.0%	15.8%

Source: USDA, DJIndexes.com, Bloomberg, Wellington West Capital Markets Inc.

**Large scale farming provides opportunities for more efficient operations, driving farm consolidation and the emergence of public corporate farms.** The average size of farms is rising on a global level, bringing with it economies of scale in operations such as a wider base for capital asset amortization, specialized positions such as agronomists, diversity in crops and operations, opportunities for vertical integration, scale purchases of inputs, and increased negotiating power. We have seen six public corporate farms emerge in the past fourteen months, and a total of eight since November 2005 with a combined enterprise value of over US\$4.4 Billion. Operations span the globe from Uruguay and Brazil to Russia, Germany and the Ukraine, producing a wide variety of foodstuffs, from blueberries to camilina to wheat. We believe this trend will continue, and that additional investment opportunities in corporate farming will emerge as smaller land holdings are consolidated and an ageing farming generation monetizes their assets. There are many factors to consider when evaluating corporate farmland; in this report we aim to highlight what we view as the most important ones.

**We believe an investment decision in farmland should be driven by factors that are more important than just price, specifically soil, water, politics, and ownership regulations.** We look at five components when evaluating productive farmland: (1) good quality soil, (2) access to abundant sources of water, (3) access to labour and infrastructure, (4) a clear understanding of land ownership regulations, and (5) the associated geopolitical risk of the region. Price does play a factor, but it is highly dependent on the above qualities, which affect the productive yield of the land.

**Farm price appreciation probably has a long way to go as farmland ownership costs are a relatively small factor in farming economics.** Land as an input cost can be one of the smallest factors in the profit equation, below fuel, chemicals, fertilizers, seeds and marketing. As a result, a large appreciation in farm land prices has a muted effect on farm profitability. For some of the higher value crops with larger labour and marketing components, land costs are clearly the smallest component on the expense side. As a result of this, there is significant margin available for land prices to drastically appreciate with only a minor impact on farm profitability. Even a 50% increase in land prices would only reduce cash margins by an estimated 1%-6%.

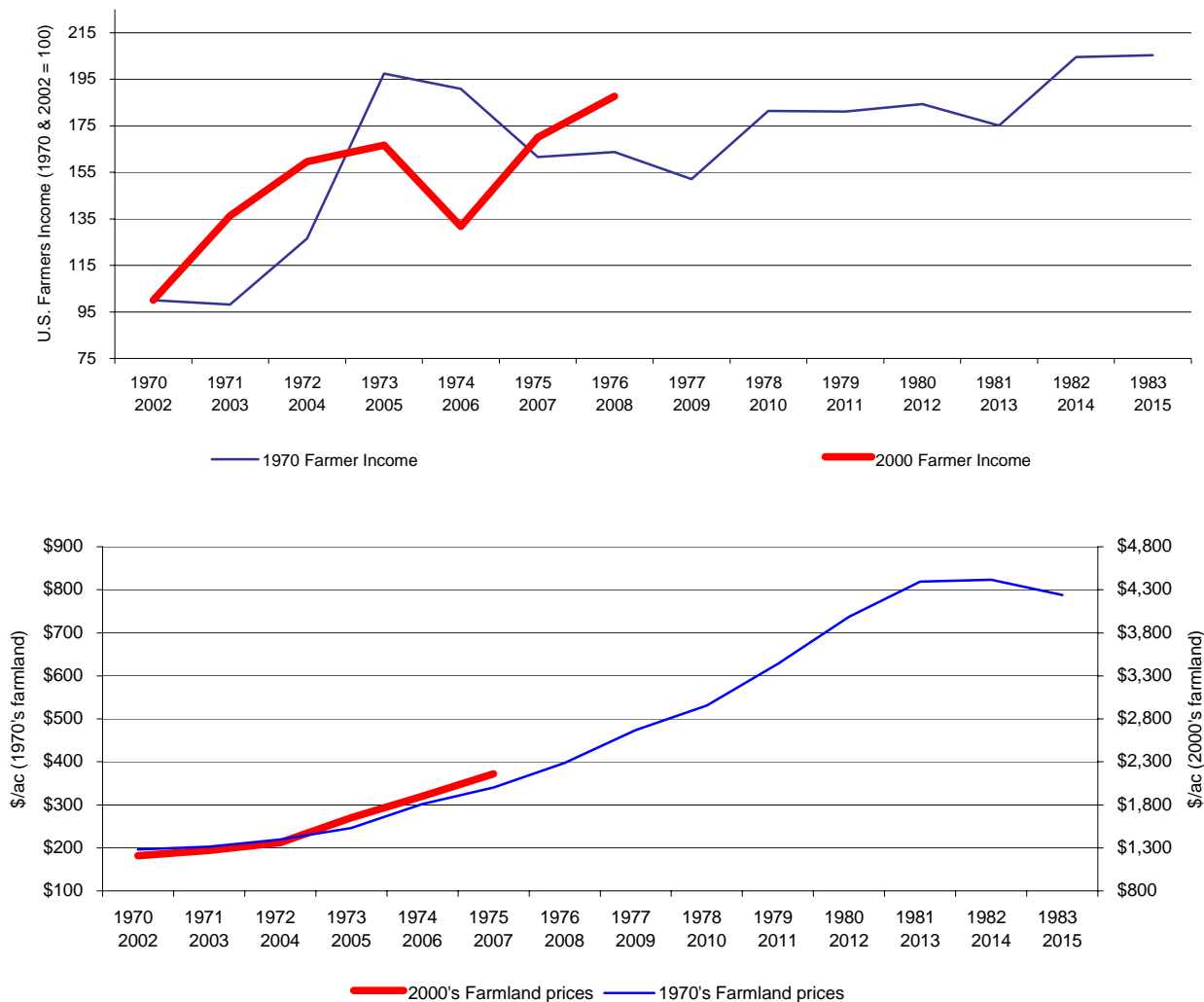
**Based on access to water and high quality soil, combined with an available labour force, existing infrastructure and political stability, our current favourite locations to invest are parts of South America (Uruguay, Paraguay, Brazil), Eastern Europe (Romania, Bulgaria, Poland, Czech Republic), and Canada.**

## A Long-Term Appreciation in Farmland

### *High Farm Income: Main Force behind Farmland Price Appreciation*

We believe it is **high** – and not necessarily rising – farm income that supports a period of rising farmland values. Although agriculture input costs with fast turnover (potash, seeds, machinery, etc.) can appreciate in value relatively quickly with higher farmer income, slower turnover productive capital (i.e.: land) has historically taken longer to “catch up” to farmer income levels. In 1972 and 1973, farm income rose 28% and 58% respectively, only to pull back slightly over the four years following. Even with the pullback, farmer income levels remained significantly elevated relative to the 1960’s, and farm values rose steadily for the next nine years through to 1981 as shown in Exhibit 2. Currently, farmer income has risen steadily since 2006, and is likely to continue rising given the tight soft commodity supply/demand dynamics. We believe this sets the stage for sustained farmland price appreciation.

**Exhibit 2: High Farm Income Supports Longer-term Rising Farmland Prices**

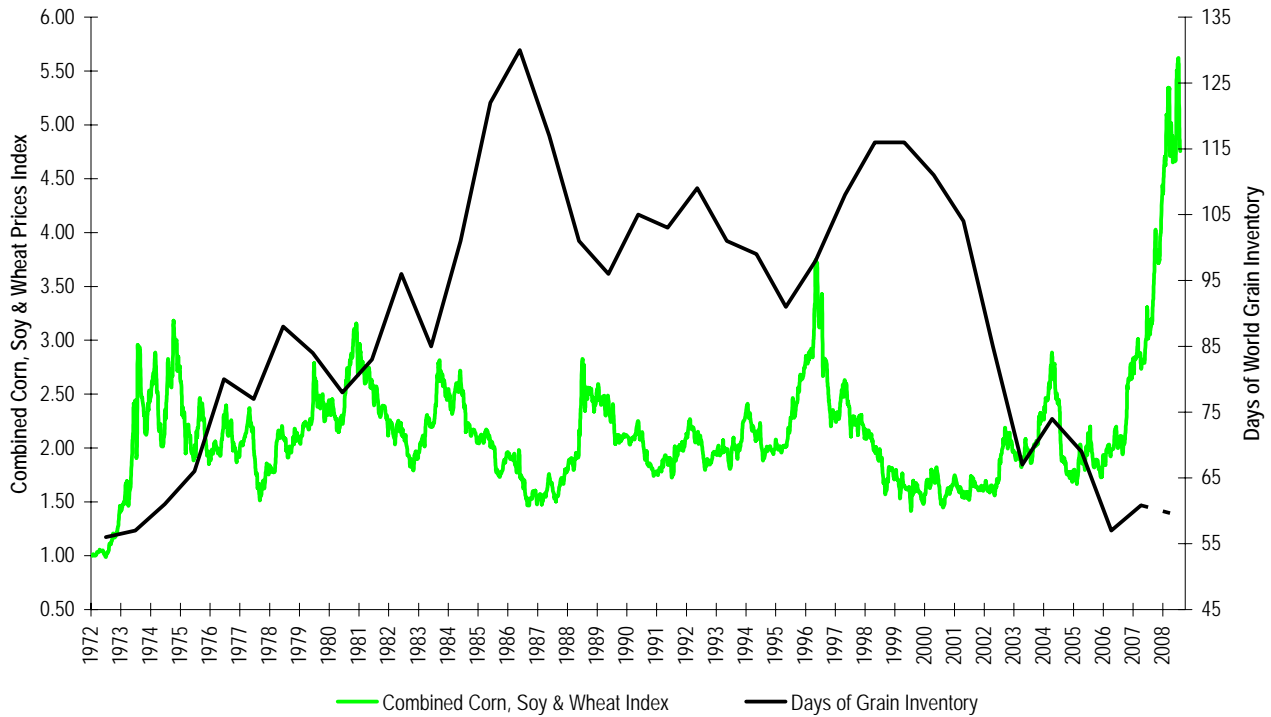


Source: USDA, Bureau of Economic Analysis (U.S. Department of Commerce), WWCM.

**Farmer income has been propelled upward by the rise in soft commodity prices, driven by a rising global population and increasing Asian GDP leading to higher protein diets.** The main driver behind agricultural consumption is rising income levels, which lead to protein-rich diets and grain-intensive economies (Exhibit 4). The two most populous nations of the world – China and India – are expected to experience annual GDP growth at a rate of 8.4% and 7.0% respectively from 2007 – 2016. This will likely lead to significantly higher quality meat production (beef), which takes 3.5x more grain per kilogram produced than lower intensity livestock (chicken).

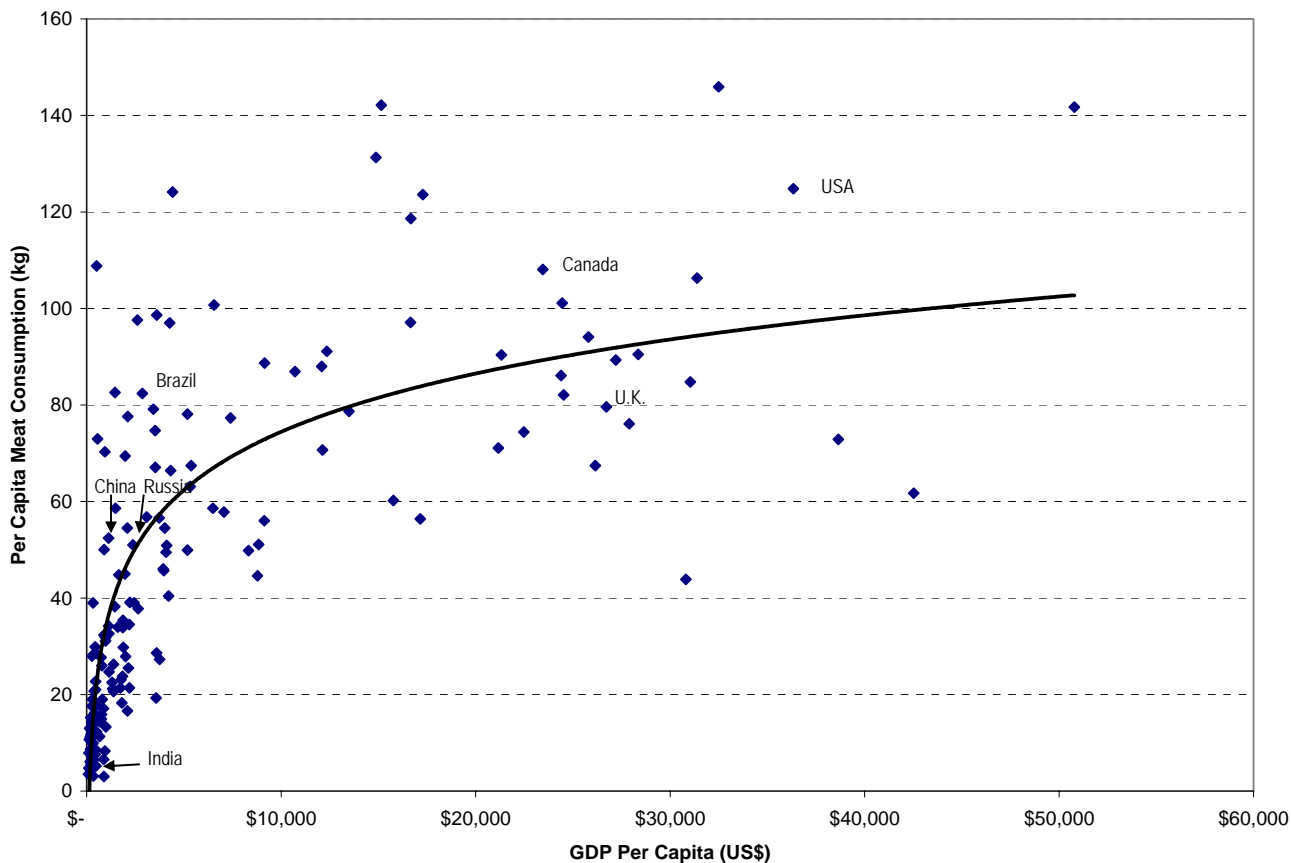
**Exhibit 3: Combined (Corn, Soy & Wheat) Index Versus Days of World Grain Inventory 1972-2008**

Corn, Soy & Wheat Index Vs. Days of World Grain Inventory 1972- 2008



Source: Corn, Wheat, Soy Index – Bloomberg; Days of Inventory Forecast (2007 & 2008) – USDA, World Agricultural Supply and Demand Estimates, October 12, 2007; and Days of Grain Inventory (1972-2006) – Earth Policy Institute, Grain Indicator Data.

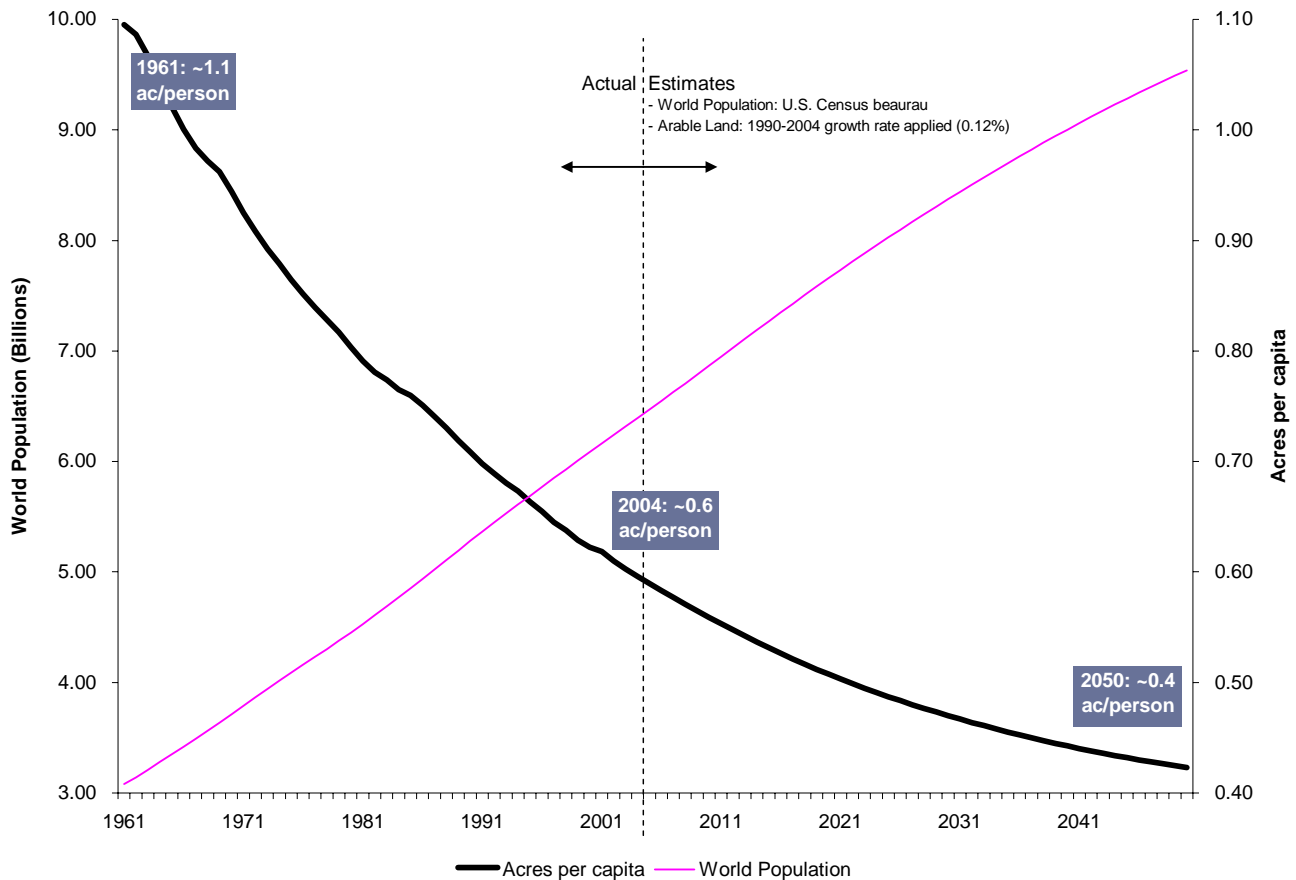
**Exhibit 4: Per Capita Meat Consumption Versus Per Capita Income**



Source: Per Capita Meat Consumption – Food and Agriculture Organization of the United Nations, Statistical Services, 2004; and GDP Per Capita Income – International Monetary Fund, World Economic Outlook Database, April 2007

*Secondary Driver: Less Arable Land with Lower Yields*

**Compounding the rise in farmland prices is the drastically shrinking supply of arable land per person.** Globally, arable land per person has almost been cut in half since 1960 – and is now estimated to be less than 0.6 acres/person, down from 1.1 acres/person less than 50 years ago. Although arable land itself has increased slightly over the same time period, largely at the expense of woodland, the rate at which it has increased has slowed in the period where data is most readily available (up to 2002). As a result, with the growing world population and almost flatlining land available for agriculture, we believe a scarcity premium will be applied to farmland, raising the bar for productive land overall.

**Exhibit 5: Arable Land Per Person – A Formula for Rising Land Prices**


Source: U.S. Census bureau, CIA World Factbook, U.N. Food and Agriculture Organization

**Although some areas of the world have the potential to increase their arable land, some regions – most notably, the United States and Russia – are experiencing significant declines.** There are some regions where expansion opportunities exist, either in land available for conversion, or farmland that has laid fallow for decades, and is now being revisited. As an example, the cerrado (frontier) land in Brazil may contain an additional 75mm ha of potentially cultivatable land, which is almost as much as the U.S. grain and soybean plantations. Furthermore, certain areas of eastern Europe contain large stretches of formerly arable farmland that was reclaimed by the former Soviet Union, and has lain fallow through the long stretch of low soft commodity prices, and political unrest as the USSR dissolved.

**Arable land has shrunk by 6% in the U.S. and 7% in Russia since 1992, resulting in a loss of an astonishing 20mm ha of arable land, or an area roughly the size of Nebraska.** Falling water tables and retreating surface water sources are causing an increasing occurrence of arid tracts of desert land, which is infringing on previously fertile farmland. Furthermore, growth of urban centers has pushed back the neighbouring farm plots, adding to the reduction of land available for cultivation.

**Adding to the supply constraints is plateauing farmland yield, which is driving the demand for farmland up as producers seek to secure more productive assets as opposed to being able to derive higher production from existing assets.** From 1980 through the early 1990s, expanding yields, which were driven by advancements in seed and harvest technology, fertilizer and pesticide were largely responsible for global grain output increases as the growth in grain production was almost identical to the expansion in yields at 2.56% annually (as shown in Exhibit 6). Since the early 1990's, yield expansion has slowed to 1.19% per annum according to the USDA and is forecast to decline further to 0.79% per annum over the next eight years. This trend towards plateauing yields, combined with shrinking arable land, is leading to concerns about the ability to drive rapid supply increases in response to tight inventories and rising prices.

#### **Exhibit 6: Historical & Projected Global Wheat and Course Grain Yields**

Period	Average yield/ha	Yield CAGR
1980-1993	2.24	2.56%
1994-2007	2.67	1.19%
2008-2016E	3.01	0.79%

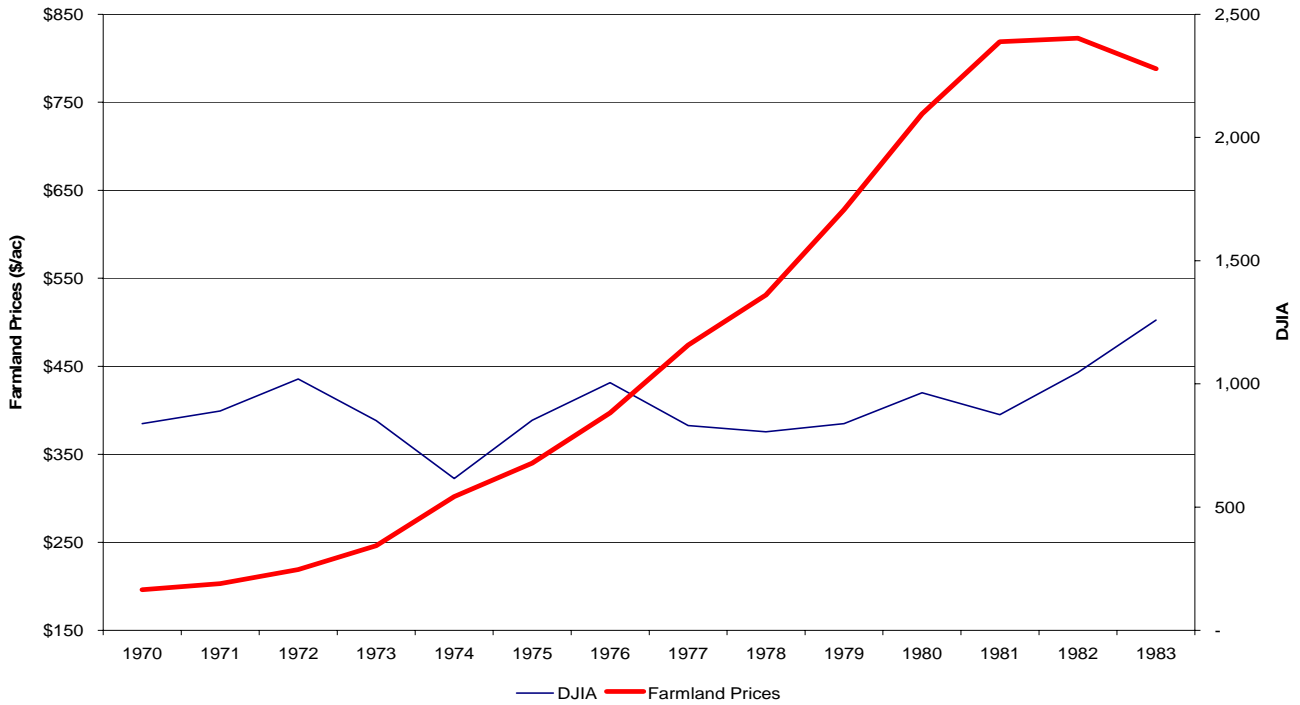
Source: Historical Global Wheat Yields – USDA, Grain: World markets and Trade, August 2007; and Projected Global Wheat Yields – Food and Agricultural Research Policy Institute (FAPRI), U.S. and World Agricultural Outlook January 2007

#### ***Outperformance of Financial Assets by Farmland in High Inflation Times***

**In the 1970's U.S. farm prices appreciated by 14% per annum while the DJIA was virtually flat – we believe similar conditions are in place now for a 10 year or longer bull market in farmland.** Multiple factors contributed to the outperformance of farmland vs. financial assets, including a stagflating U.S. economy coupled with rising farmer income, factors we believe are at work again today. Today's rising costs of inputs – namely, energy and food – do appear to have parallels to the 1970s. With inflation rising as the cost of these inputs goes up, there is the potential for equity markets to suffer significantly. As shown in Exhibits 7 and 8, farmland drastically outperformed financial assets (represented by the Dow Jones Industrial Average) on both a real and a nominal basis during this time. After adjusting for inflation, the total return for the DJIA was -40% while farmland had posted a 76% gain (Exhibit 8) over the 12 year period.

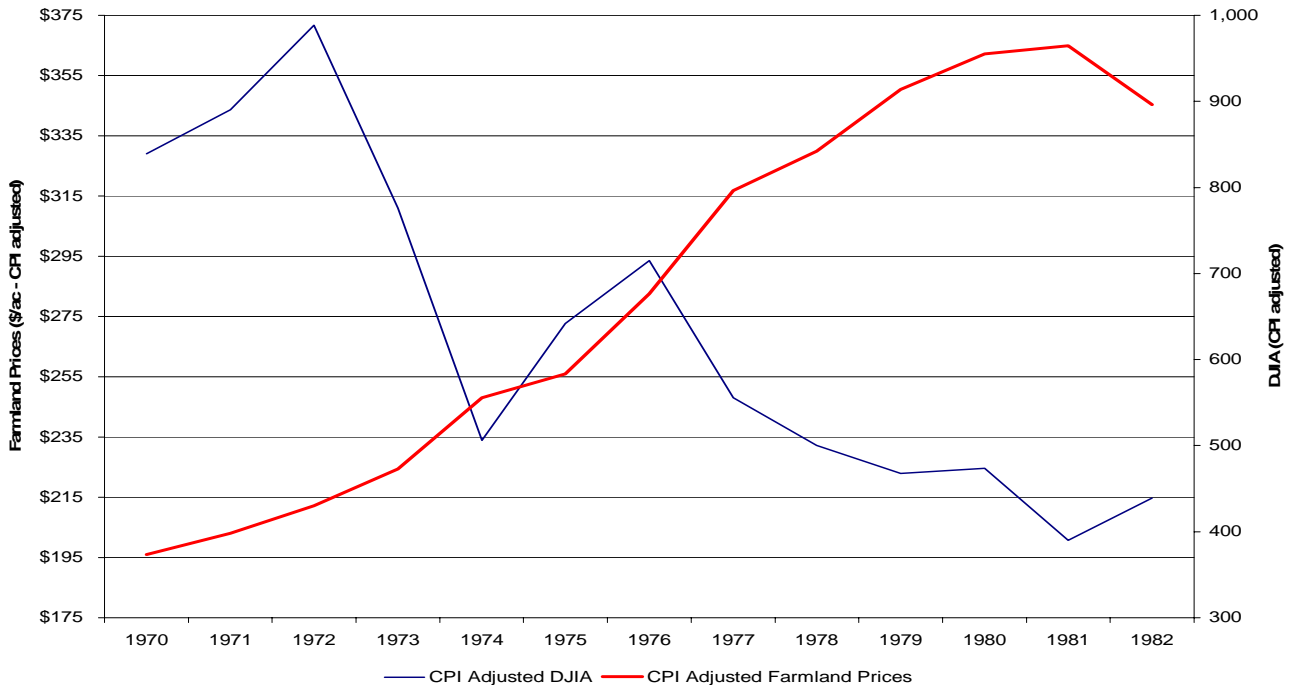


**Exhibit 7: Nominal: Significant Farmland Outperformance of Financial Assets in High Inflation Periods**



Source: USDA, [www.djindexes.com](http://www.djindexes.com), Wellington West Capital Markets Inc.

**Exhibit 8: Real: Significant Farmland Outperformance of Financial Assets in High Inflation Periods**



Source: USDA, [www.djindexes.com](http://www.djindexes.com), Wellington West Capital Markets Inc.

**Adding to this outperformance is the yield generated from the farmland over that period – the DJIA with an average yield of 4.8% vs. farmland at approximately 7%.** Overall, this suggests that farmland would have provided investors with a 21% total return (capital appreciation plus cash yield) each year for the 11 year period from 1970 to 1981 vs. the DJIA at 6.7%.

### *Farmland Values Today: Similar Economic Backdrop, Better Fundamentals*

**Overall, we believe we are only a few years into a potentially decade-long period of rising farmland values.** Supported by rising farmer income based on heightened demand for soft commodities outstripping available supply, our view is that the next five to seven years could see double-digit percentage growth year over year in farmland values. Macro themes we have discussed in detail such as rising Asian and Indian GDP spurring higher protein diets and historically unprecedented petroleum prices causing a shift towards biofuels are providing the lift in demand. Longer term, the global arbitrage in land prices will likely disappear, as low-priced (and low-yielding) farmland is improved via modern farming methodology, itself increasing the global food supply and bringing farmland price growth back down to the long-term (107 year) CAGR of 4.9%.

**The economic comparisons between the 1970's and today are numerous, which we believe has created a macro environment that fosters farmland value outperformance vs. financial assets.** Heightened North American inflation is effectively undisputed with the June 2008 CPI rising 1.1%, the second largest one-month rise in 26 years, having been beaten over that period only in September of 2005 by the Hurricane Katrina impact. Concurrently, payroll numbers are falling, causing the unemployment rate to creep higher, now at 5.5% up from a recent low of 4.6% in January of 2007. This compares to the 1970's steady inflation upticks, which included two notable spikes of July 1973 with a 1.8% consecutive increase, and February 1980 at 1.5%, while unemployment moved from a low of 4% to spike at 9% in 1975. Overall, the current period of supply constraints driving up the cost of living does appear to be a common bond between the 1970's and today.

**We believe we are in a secular uptrend in the soft commodity cycle, with high farmer income forecast to drive farmland prices higher in the foreseeable future.** Three key growth drivers for soft commodities in recent years have been the growth in Asian GDP, continued rising global population and increase biofuel usage. Although recent rhetoric from the OECD and U.N. suggest the possibility near-term pressures on biofuel mandates, we believe the broader trend of a tightening global food supply is intact.

## Qualities of an Attractive Farmland Investment

**When evaluating the potential for quality farmland investments we believe investors should assess multiple aspects, one of which is the underlying price of the land.** We look at the investment to contain a corporate farm of substantial size, which ideally is both the owner and operator of the farmland. Beyond that, a determination of the soil quality combined with access to an abundant water source will likely be a determining factor in the productive capability of the land and the cost of that production. Finally, an assessment of both the geopolitical risk and the land ownership structure of the country will provide guidance as to the risk level the investment entails. Finally, comparing the premium paid for the investment versus companies operating in similar environments can guide the appropriate price.

### *Larger Farm Size: Provides Opportunities for Higher Efficiency*

**We believe that an increasing economy of scale applies to farming, and that the cash productivity per acre rises for large corporate farms versus smaller plots.** A large portion of the economies of scale for farming come from the distribution of capital inputs across a much broader acreage. Machinery such as combines and tractors can (a) have higher utilization and (b) have lower costs-per-acre – research by the University of Illinois suggests a per-acre saving of up to 18% for larger plots versus small plots. Additionally, large bulk purchases of variable input costs such as fertilizer, herbicides, insecticides and seeds can likely be made at discounts to the spot price. Finally, with scale operations comes the ability to employ specialized labour inputs such as agronomists, combined with potentially superior seed varieties, which could result in slightly higher yields per acre. **Even a 5% increase in yield combined with a slight 2% reduction in per-acre fixed costs has significant leverage for corporate grain farming, raising the profit margin from 28% to 32% as shown in our generic farm model, Exhibit 9.**

**Exhibit 9: Increasing Yield with Size**

	Grain Average <sup>1</sup>		Vegetable Average <sup>2</sup>	
	Small Farm	Large Farm	Small Farm	Large Farm
<b>Revenue</b>				
Yield (units/acre)	87	91	1,043	1,064
Price/unit	\$ 8.91	\$ 8.91	\$ 9.00	\$ 9.00
Unit	Bushels		-Various-	
Revenue/Acre	<b>\$ 772</b>	<b>\$ 811</b>	<b>\$ 9,390</b>	<b>\$ 9,578</b>
	100%	100%	100%	100%
<b>Expenses</b>				
	As a percent of revenue generated per acre			
Fuel (Direct and Indirect)	20.0%	18.7%	4.1%	4.0%
Direct: Tractor <sup>3</sup>	4.5%	4.3%	1.0%	1.0%
Indirect: Fertilizer and Lime	15.4%	14.4%	3.1%	3.0%
Herbicides, Insecticides, Fungicides	5.5%	5.1%	5.7%	5.6%
Harvesting, Marketing, Transportation <sup>4</sup>	4.5%	4.3%	62.2%	61.0%
Seed	3.9%	3.7%	3.9%	3.8%
<b>Land Rent</b>	<b>13.0%</b>	<b>12.3%</b>	<b>2.7%</b>	<b>2.6%</b>
Labour	2.4%	2.3%	1.6%	1.5%
Irrigation	2.1%	1.9%	1.1%	1.1%
Other <sup>5</sup>	18.0%	16.6%	14.8%	14.4%
<b>Cash Return/Acre</b>				
	<b>\$ 214</b>	<b>\$ 261</b>	<b>\$ 333</b>	<b>\$ 547</b>
	28%	32%	4%	6%
<b>Unlevered ROI</b>				
	<b>9.1%</b>	<b>11.1%</b>	<b>7.1%</b>	<b>11.6%</b>
<b>ROE @ 30% Leverage, i = 6%</b>				
	<b>10.4%</b>	<b>13.3%</b>	<b>8.8%</b>	<b>15.3%</b>
<b>Assumed cost/acre</b>				
	\$ 2,350	\$ 2,350	\$ 4,700	\$ 4,700

1 Simple grain average consists of corn, wheat and soybean

2 Simple vegetable average consists of green onions, sweet potato and tomato

3 Tractor expense includes variable cost of repair, fuel and lubricant

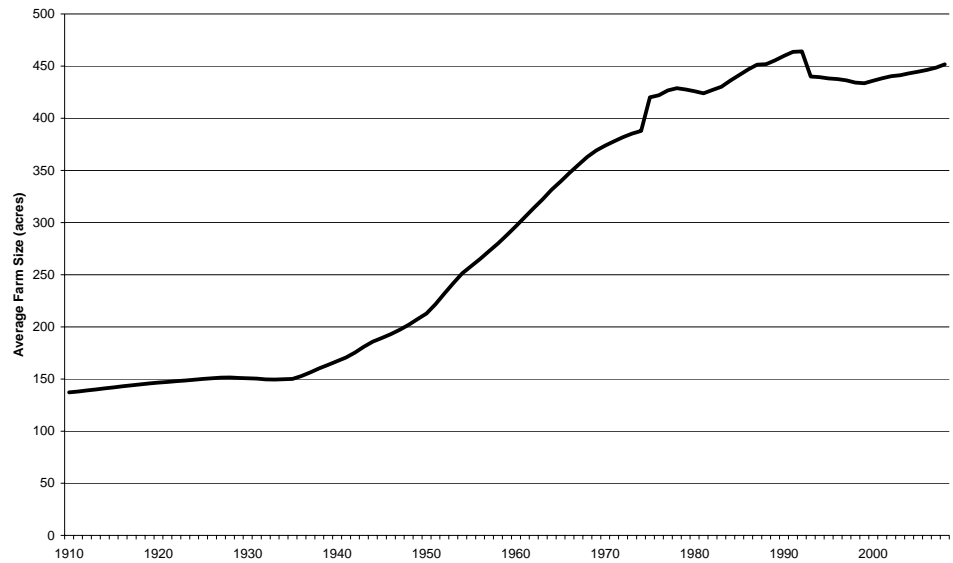
4 Harvesting cost significantly higher for vegetables as they are hand-picked and custom packaged

5 Includes: Interest on operating capital, maintenance capital and general overhead

Source: Clemson University, CBOT, Wellington West Capital Markets Inc.

**In-line with what would be expected from an industry with increasing returns from scale, the average size of the farm in the U.S. has been steadily increasing since 1936.** Consolidation of farming and rising average farm size in the U.S. has been a function of the mechanization of farming processes and increasing returns to scale promoting larger plots of land. Additionally, economies of scope are likely present with corporate farming operations, allowing these corporations to have more stable exposure to a variety of soft commodities as well as geographic diversification.

### Exhibit 10: Increasing average U.S. farm size



Source: USDA, Wellington West Capital Markets Inc.

#### *Owner/Operator Model: Lower Risk, Benefits of Scale*

**We believe that the owner/operator model is the preferred method of gaining exposure to a farmland investment versus the owner/landlord model.** In this report we have focused on the owner/operator model, where the corporation owns (or leases) the land and also undertakes agricultural activities to generate yield from the land. There also exists a model whereby a pool of capital enters into a sale and leaseback-style agreement with the individual farmer, who continues to operate the farm itself. Our preference for the owner/operator model stems from two key reasons:

- 1) **Higher returns from scale:** By leasing back the land to the individual farmers, the landlord model does not consolidate operations, suggesting that there is little or no lift in productive yield, and little to no cost efficiencies.
- 2) **Lower risk of repatriation:** If a foreign concern owns (or leases) the land and is generating yield for a country, we believe there is likely less risk of the state attempting to nationalize the land holdings as the company is providing employment and increasing the security of food supply for that country. If the foreign concern merely owns the land and funnels utility (cash) away from the country in the form of rent, while the yield is generated by domestic labour and capital, we believe there is more incentive to return the land to domestic interests.

#### *Water Availability and Soil Quality: Positive Influence on Yield, Margins*

**The quality of the soil and availability of water are both directly related to the value of the land as higher quality regions both increase the cash yield**

**per acre and reduce the year-over-year variability of the yield.** High quality soil can significantly reduce the amount of fertilizer a farmer is required to use on their land in order to gain the same crop yield vs. low quality soil. This impact can be impressive, with lower quality soils such as those present in Illinois requiring on average 2.25x more nitrogen, phosphate and potash as an average high quality soil Nebraska farm<sup>1</sup>. A doubling of fertilizer usage can significantly impact the profitability of a farm.

**Exhibit 11: High Quality Soils Can Significantly Reduce Fertilizer Usage**

	Average lbs/ac <sup>1</sup>	Premium to Nebraska Usage	Grain Crop Cash Margin <sup>2</sup>
Illinois	187	2.25x	23%
Idaho	157	1.89x	29%
Minnesota	146	1.75x	31%
Ohio	140	1.68x	32%
Montana	121	1.45x	35%
Kansas	114	1.37x	37%
North Dakota	114	1.37x	37%
South Dakota	111	1.33x	37%
Washington	110	1.32x	37%
Nebraska	83	1.00x	42%

1: Fertilizer lbs/ac taken from a simple average of Wheat, Corn and Soy average application of Nitrogen, Phosphate and Potash from USDA data. Only states with uninterrupted data series were used in this sensitivity.  
 2: Grain Crop Cash Margin determined by applying premium to our WWCM Average Grain Crop Model which includes average inputs for Wheat, Soy and Corn.

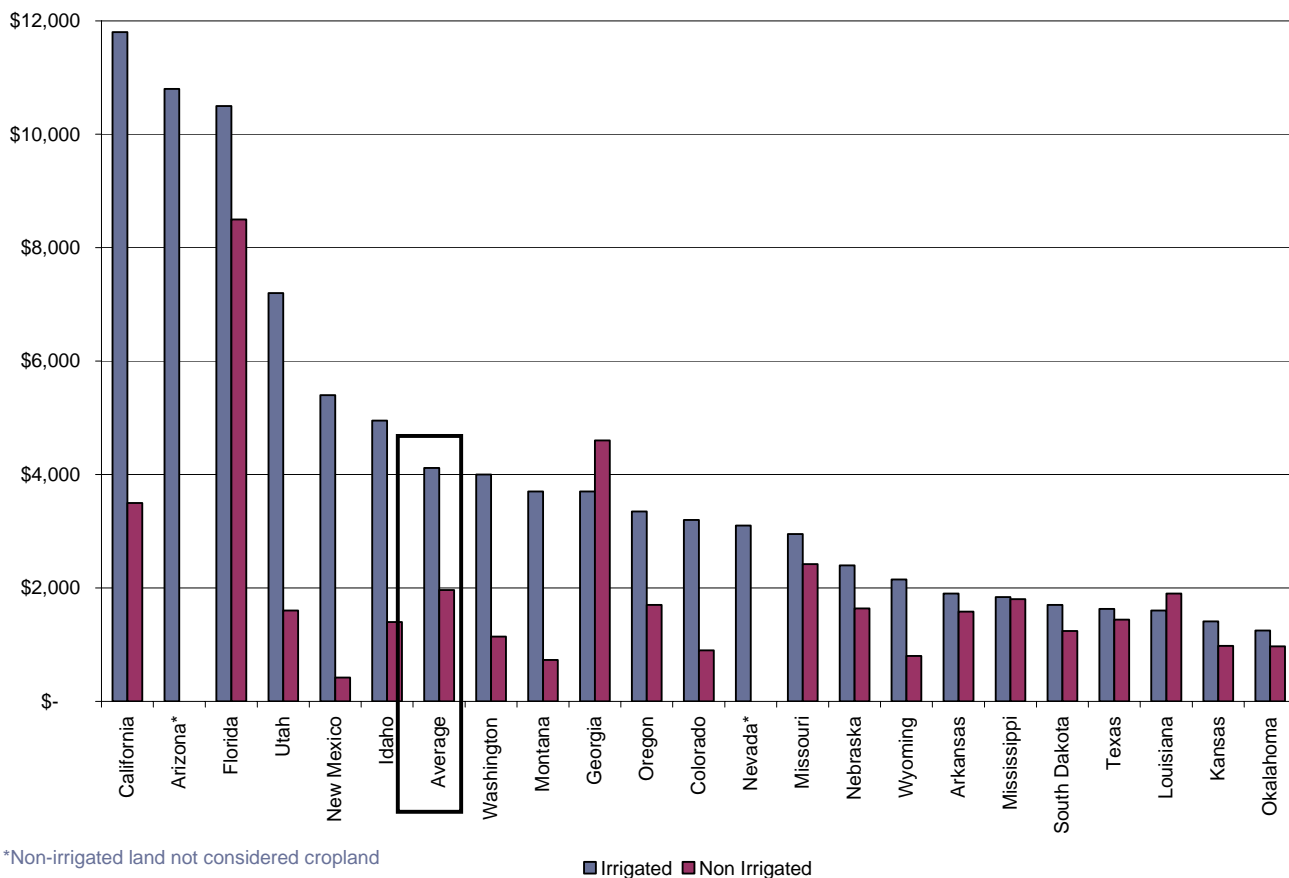
Source: USDA, Clemson University (SC), Wellington West Capital Markets Inc.

**Well irrigated land can increase the crop yield by 50% to 80% for some grains, lifting the cash yield of the acreage by a corresponding 60% to 80%, even when accounting for higher costs associated with the irrigation.** Irrigated farmland provides the crops with an appropriate supply of water, which high-grades the growing conditions, while also dramatically reducing the risk of crop losses from drought. This higher level of confidence in crop revenue typically results in a willingness to put greater levels of upfront capital in the crop, further strengthening the yield. For example, spending \$16,000-\$20,000 on fertilizer for a 640 acre plot (one section) could be seen as a high risk investment without irrigation to essentially guarantee the crop will grow. As a result, dryland farmers may use lower levels of fertilizer, with corresponding lower crop yields, in order to have reduce capital at risk.

**Irrigated land does command a premium value as a result of the drastic improvement in cash yields; in the United States the average premium is a 110% increase over non-irrigated land.** Exhibit 12 shows the 2007 land values by state in the U.S.; on average irrigated land cost \$3,700/ac vs. non-irrigated at \$730/ac. Also important to note are the states of Arizona and Nevada, which have no average price for non-irrigated cropland. Land without water in those states is not considered cropland by the USDA.

<sup>1</sup> We use readily available statistics on variation within the United States as an example of the potential global variability in fertility of soil vs. farm fertilizer usage.

**Exhibit 12: U.S. Farmland Prices – Premium for Irrigated land**



Source: USDA, Wellington West Capital Markets Inc.

**In the subsequent section, we address the availability of water and the quality of the land on a global scale.** This goal of this global review is to highlight certain regions which exhibit qualities that would positively impact farmer economics.

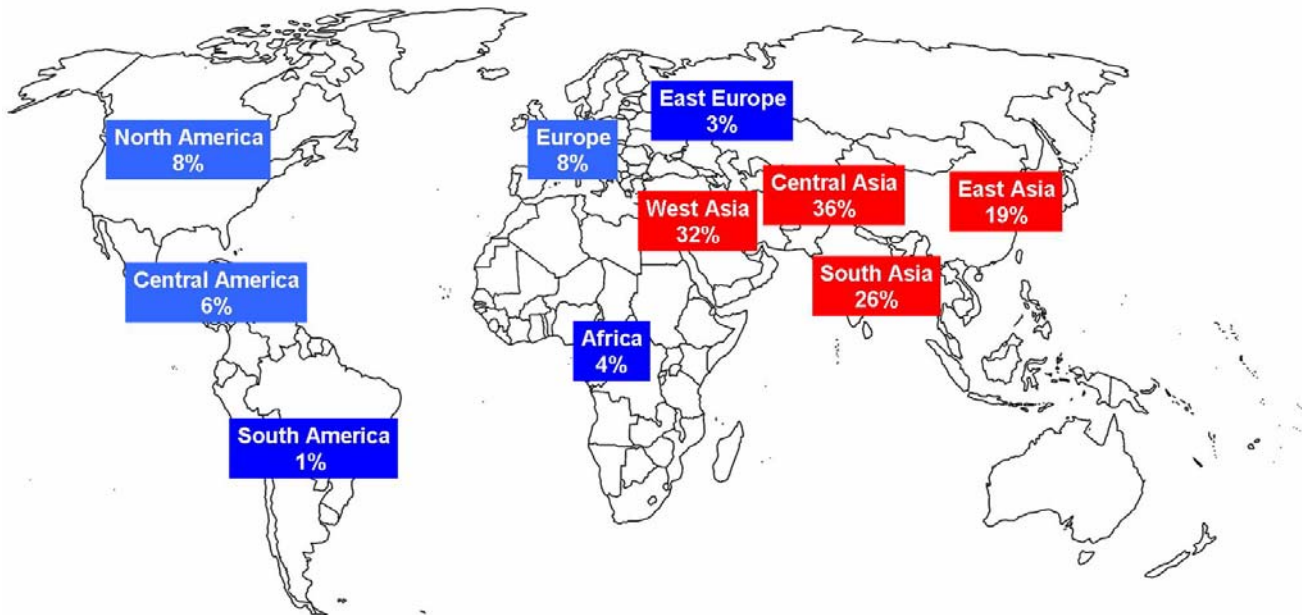
**Water Supply: Global review**

**Availability of renewable water resources is an important component for determining the ultimate productive capacity of farmland.** With water scarcity comes increased costs of irrigation, heightened exposure to weather patterns drastically altering crop yields, and droughts causing significant tensions between water users. In regions of reduced renewable water resources, farmland opportunities can exist – we cite an example the high level of water technology present in Israeli greenhouse-style farming – but at a significantly heightened capital investment.

**Water supply is the availability of renewable water resources, which comes from three sources, namely; precipitation, recharge of groundwater resources and surface inflows from neighbouring countries.** This inflow is then matched against water usage for domestic, industrial and agricultural

purposes, giving rise to the “water payout ratio.” There is a vast disparity of percentage usage across the world, with ‘water poor’ nations such as Kuwait or the UAE using 2200% and 1150% respectively of their renewable water resources on an annual basis. This scales to ‘water rich’ nations such as Russia, Canada and Peru who have 4.5mm, 3.3mm and 1.9mm cubic kilometers of annual renewable water resources, and each use just 1.05% to 1.7% per year for the total national requirements.

### Exhibit 13: Annual Withdrawal of Renewable Water Sources



Source: CIA World Factbook, WWCM

**Especially for nations with larger physical area – such as the United States, China and Russia – there can be significant regional disparities, creating areas of surplus or shortfall.** North Africa<sup>2</sup> represents 29% of the land area in Africa, yet contains only 5.4% of the continent’s renewable water resources. The Democratic Republic of the Congo alone contains 24% of Africa’s water, over 1,280 km<sup>2</sup> per year of renewable water resources, within its geopolitically unstable borders. Broadly speaking, we see that countries that use below 15% of their renewable water resource typically not have urgent water scarcity issues, while countries that use above 25% of their water resources may have slight to severe water supply concerns.

**In Europe, Eastern and Northern Europe<sup>3</sup> the use of renewable water resources is relatively low at 3.4% and 2.3% respectively vs. Western and**

<sup>2</sup> Defined as Algeria, Egypt, Libya, Morocco, Sudan, Tunisia and the Western Sahara as per the U.N. continental subclassification

<sup>3</sup> Defined as: Eastern: Belarus, Bulgaria, Czech Republic, Hungary, Moldova, Poland, Romania, Russian Federation, Slovakia, Ukraine; Northern: Channel Islands, Denmark, Estonia, Faeroe Islands, Finland, Guernsey, Iceland, Ireland, Isle of Man, Jersey, Latvia, Lithuania, Norway, Svalbard, Sweden, United Kingdom as per the U.N. continental subclassification



**Southern<sup>4</sup> Europe at 15% and 11.9%.** As a result, our preference for irrigable land in Europe does trend to the north and east. Within that subclassification there are some notable exceptions such as Latvia which actually suffers from an excess of water resulting in arable land requiring sufficient drainage infrastructure in order to obtain adequate yields. Current estimates are that 16,000 km<sup>2</sup> or ~86% of the arable land has had improved drainage.

### Soil Quality and Quantity: Global Review

**The productive capability of a nation can be linked to both the quantity of arable land present and the quality of that land.** Some of the highest agricultural output areas are associated with high quality soil, rich in organic matter. Globally, the best soils are located in the North American plains and across Europe, stretching into the south of Russia. The FAO has classified soils which do not have any of the eight major soil constraints (outlined in Appendix I). Exhibit 14 provides a list of the top 20 countries by (a) absolute soil area and (b) soil without major constraints as a % of total land available.

### Exhibit 14: Soil without Major Constraints

Soil Without Major Constraints		
	Area mm ha	% of total land
Russia	767	Moldova 78%
United States	304	Ukraine 75%
Canada	207	Azerbaijan 62%
China	189	Gambia, The 60%
Australia	143	Armenia 60%
India	129	Korea, North 58%
Argentina	92	Philippines 57%
Brazil	74	Japan 56%
Kazakhstan	61	Lesotho 56%
Mexico	54	Jamaica 55%
Indonesia	51	France 54%
Ukraine	46	Belgium 53%
Turkey	38	Denmark 52%
Iran	37	Belarus 51%
Ethiopia	37	Bulgaria 50%
Mongolia	34	Bosnia and Herzegovina 49%
Mozambique	34	Turkey 49%
Sudan	33	El Salvador 48%
Congo, DR	33	Czech Republic 48%
Colombia	30	Dominican Republic 48%

Source: FAO, WWCM, CIA

**A few trends do emerge, with countries known as high producers of grain and foodstuffs appearing on the list including Russia, the U.S., Canada and**

<sup>4</sup> Defined as: Western: Austria, Belgium, France, Germany, Liechtenstein, Luxembourg, Monaco, Netherlands, Switzerland; Southern: Albania, Andorra, Bosnia and Herzegovina, Croatia, Gibraltar, Greece, Holy See, Italy, Malta, Montenegro, Portugal, San Marino, Serbia, Slovenia, Spain, Former Yugoslav Republic of Macedonia

**Australia.** Also notably, nine of the top 20 by % of total land are European nations. Most of the above countries would likely be able to sustain commercial agricultural operations based on the quality of soil present.

**Beyond the major constraints to soil composition there are several other criteria that could impact the productive capacity of land (and whether it is classified as arable).** The Land and Water Development Division of the FAO uses the following criteria to derive a physical resource potential rank on a global scale.

### **Exhibit 15: Physical Resource Potential**

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#### *Equivalent potential arable land*

The land available that is not used for non-food crops, as a percentage of total land area

#### *Desert and drylands*

Areas that have no growing period (deserts) or fewer than 179 days (drylands) as a percent of total land area

#### *Steeplands*

Areas where the dominant slope of the land is greater than 8% as a percentage of total land area.

#### *Land degradation severity*

A weighted average of land degradation based on severity. Land degradation is simply when human interference results in the productive capacity of land being significantly reduced.

#### *Actual arable land*

Productive land on a per capita basis.

#### *Land balance*

Arable land as a percentage of potential arable land. With higher values necessarily comes a lower 'reserve' of additional potential land.

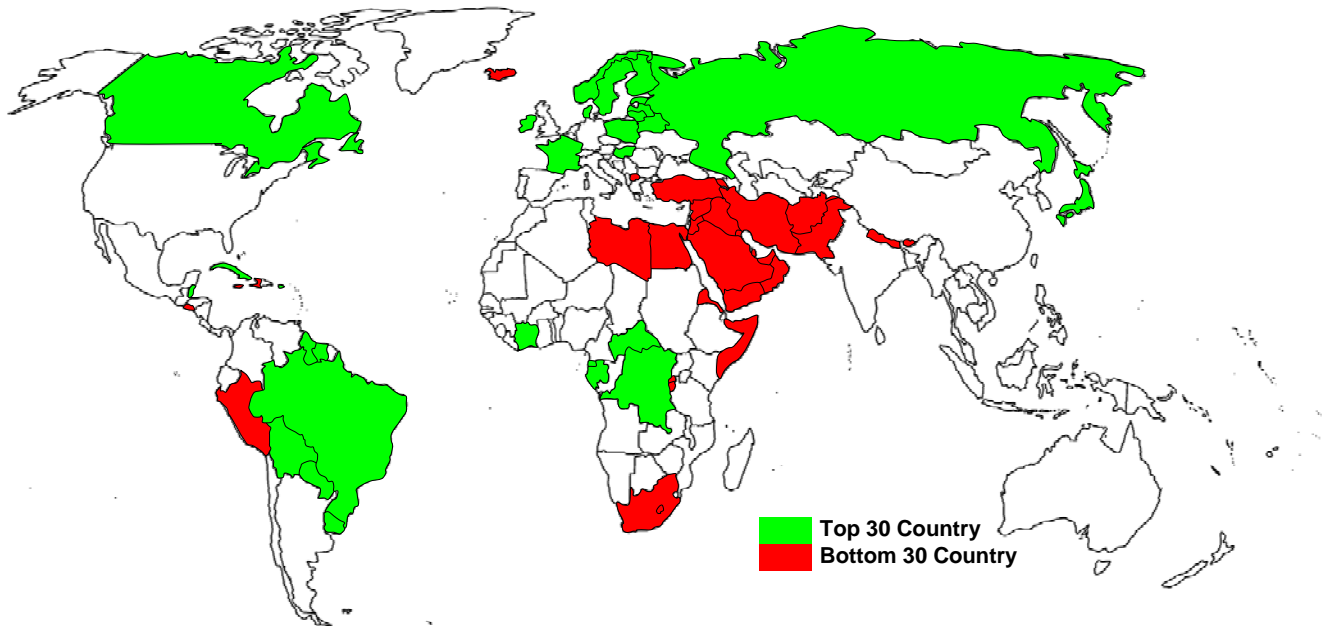
#### *Population increase*

Countries with higher population increase year over year will likely have increased pressure on producing foodstuff, thereby reducing total arable land per person.

Source: FAO, Wellington West Capital Markets Inc.

The net result of these seven criteria is a global ranking of the land available for agricultural production, with the top and bottom performers highlighted in Exhibits 16 and 17.

**Exhibit 16: Top 30 and Bottom 30 Countries Based on Soil Quality - Map**



Source: FAO, Wellington West Capital Markets Inc.

**Exhibit 17: Top 30 and Bottom 30 Countries Based on Soil Quality - List**

Top		Bottom	
1 Uruguay	16 Japan	131 Libya	146 Lesotho
2 Guyana	17 Paraguay	132 El Salvador	147 Rwanda
3 Ireland	18 Belize	133 Macedonia	148 Puerto Rico
4 Lithuania	19 Malta	134 Turkey	149 Qatar
5 Belarus	20 Cote d'Ivoire	135 Jamaica	150 Afghanistan
6 Central African Republic	21 Hungary	136 Burundi	151 United Arab Emirates
7 Latvia	22 Sweden	137 Armenia	152 Pakistan
8 Denmark	23 Finland	138 Nepal	153 Iran
9 Gabon	24 Bolivia	139 Iceland	154 Saudi Arabia
10 Equatorial Guinea	25 Canada	140 Syria	155 Iraq
11 Estonia	26 Poland	141 Somalia	156 Eritrea
12 Suriname	27 Cuba	142 Egypt	157 Kuwait
13 Peru	28 Congo	143 South Africa	158 Jordan
14 Brazil	29 Russia	144 Haiti	159 Yemen
15 France	30 Norway	145 Bhutan	160 Oman

Source: FAO, Wellington West Capital Markets Inc.

**Clear patterns begin to emerge with the arid Arabian peninsula and middle east as well as the majority of North Africa representing areas with poor soil quality and/or other prohibitive characteristics.** Furthermore, vast stretches of arable tracts appear in eastern Europe and throughout South America, coinciding with high quality chernozems and kastanozems (thick, dark topsoil – we define in detail in Appendix II). Conspicuously absent from the top-30 are Australia, Argentina, New Zealand and the Ukraine, which are ranked 35, 34, 33

and 40 respectively, and therefore missing in our somewhat arbitrary cutoff of “top 30” by only a few spots.

### *Land Ownership Regulations: Clarity a Bonus*

**Ownership of agricultural land throughout the world generally takes on the form of either direct ownership or some variation of long term lease agreements.** While ownership laws for every country are not readily available and burdensome to collect, our focused global analysis suggests direct ownership of agricultural land is predominately a Western hemisphere concept whereas many European and African countries rely more on long term lease agreements. The caveat is that the addition of some Eastern European countries into the European Union could represent a significant opportunity as government-held land is privatized and active land markets are allowed to thrive.

### *Lease vs. Own – A Global Grey Scale*

**Ownership of land can be an ambiguous term depending on the country, so we have used *own*, *lease*, and *hybrid* classification that we feel portrays who has actual ownership of the land and who has access to the yield, but not direct ownership.** We reserve the “own” condition for countries where we believe foreign individuals and companies can purchase agricultural land and reap the benefits from working the land with relatively little or no resistance. In some countries, land ownership by foreigners is restricted but still accessible via long term leases or similar arrangements, so we give these countries a “lease” classification. The Ukraine is an example of a country that prohibits ownership of agricultural land, but companies such as Landkom have been successful in signing long term lease agreements with local land owners. The ambiguous “hybrid” classification is primarily given to countries currently undergoing a significant transition of land ownership. Countries that have recently achieved European Union Accession and are beginning to open their land markets to investing are examples of countries we attached a hybrid classification to. These countries have been granted a transition period, during which time each country will have to develop an efficient market for land that facilitates indiscriminate buying and selling of land by EU members. Once the transition period ends, agriculture land in these countries can be bought by companies and persons in other EU countries.

## Exhibit 18: Snapshot of Land Ownership Availability

	Own	Variable	Lease	Comment
<b>AFRICA</b>				
Angola				All land vested to the president but foreigners can lease
Benin				Private land ownership encouraged, unclear if foreigners can purchase
Cambodia				Foreigners can get long term leases
Cameroon				
Chad				
Cote d'Ivoire				Emphyteutic lease agreement
Eritrea				All land owned by government but can be leased by foreigners
Ethiopia				Lease from government
Ghana				Foreigners can lease for 50 years
Kenya				Foreigners can lease for 99 years
Liberia				Long term land concessions
Malawi				Leasehold for medium commercial farm, freehold for large commercial farm; foreign ownership unclear
Mozambique				Land owned by government; foreigners can get 50 year lease
Namibia				Land can be owned, but foreign purchases are regulated by government
Nigeria				Foreigner can lease up to 99 years
Rwanda				Obtain "Land Use Title" for 50-99 Years
Senegal				Land state owned and can be leased or used through concession; unclear if foreigners can participate
Tanzania				Legal system slow and subject to corruption
Uganda				Requires JV majority owned by Ugandians
Zambia				Foreigners can lease for 100 years
<b>ASIA</b>				
Mongolia				Private property protection is weak
Thailand				Farming, owning land and land trading strictly prohibited by foreigners
Vietnam				Foreigners can lease for 50 years
<b>EUROPE</b>				
Albania				Land is privatized, but foreigners can only lease for 99 years
Armenia				70% of agricultural land is privately held, land prices fixed by government
Azerbaijan				Land is privately held, foreigners are prohibited from buying
Belarus				Private ownership restricted, foreigners can lease for 99 years
Bosnia				94% of farm land privately held, unclear of foreign ownership
Bulgaria				Government beginning to lift ban on foreign ownership of land
Croatia				83% of agricultural land privately held, difficult for foreigners to obtain land
Czech Republic				
Estonia				Governor Approval Required
Finland				Property rights well protected
France				Ag land for investment discouraged, family use encouraged
Georgia				Privatization of Ag land in progress, foreigners may only lease Ag land.
Hungary				EU accession requires EU members to be allowed to own land by 2011
Kosovo				91% of agricultural land privately held, foreign ownership unclear
Latvia				EU accession requires EU members to be allowed to own land by 2011
Lithuania				EU accession requires EU members to be allowed to own land by 2011
Macedonia				70% of agricultural land privately held, but restrictions on sale and use limit owners rights
Moldova				Communists return to power in 2001, attempting to undo land privatization
Norway				Government concessions required to own or use titled land
Poland				Foreigner can get "right of perpetual usufruct"
Portugal				Foreigners granted same rights as Portuguese nationals
Romania				Foreigners can register a Romanian joint stock company
Russia				Foreigners can lease 49 years
Serbia				85% of agricultural land privately held, but ownership rights are insecure
Slovakia				Foreigners may own land, but not farmland. Leasing is on a case-by-case basis
Turkey				EU accession requires EU members to be allowed to own land by 2011
Ukraine				Foreigners may lease with the lease having a renewal pre-emption right
<b>OCEANIA</b>				
Malaysia				Property is protected, but judiciary system subject to political influence
Papua New Guinea				Foreigner can lease up to 99 years
Philippines				Foreigner can lease for 50 years
<b>SOUTH AMERICA AND MEXICO</b>				
Argentina				Open to foreign investment, but government can restrict capital flow, profit remittance
Bolivia				Foreigners cannot own land with 50km of borders
Brazil				Requires Government approval, problematic record system has created conflict
Chile				Private property is well protected
Costa Rica				Investments are secure, but contracts disputes are slow to resolve
El Salvador				Limit of 245 hectares
Guatemala				Land invasion by squatters are increasingly common in rural areas
Guyana				Foreigners can lease for 25 years
Paraguay				Except land within 50 km of borders, land title records not sufficient
Mexico				Very time consuming and complex process
Peru				Land can be owned but lack tenure security; unclear of foreigners can own,

Source: NAFU SA, Cambodia Investment, OECD, Eritrean Embassy, nazret.com, Ghana Investment Promotion Center, Nairobi Chronicle, African Business, U.S. Department of State, Bernard Krief Consultants, Mongolia Ministry of Industry and Trade, Board of Investment in Thailand, U.S. Commercial Service in Vietnam, FAO, Trigon Agri, Savills, Slovakia Business, Dr. Istvan Feher (Szent Istvan University), Overseas Property Mall, The Heritage Foundation, Office of the United States Trade Representative, choices.co.uk, Ricardo Barraza and Associates, Philippine European Solidarity Centre, Embassy of Papua New Guinea to the Americas, Davao City Information Portal, Global Property Guide (Latin America), Landinbrazilonline.com, Guyana Information Portal, Nigeria Consulate

### European Union Driving Land Ownership Access

**The formation of the European Union has resulted in the privatization of agricultural land in all member countries and an active market for land that is open to investment by any person or company in a European Union member country.** While the market for agricultural land is open within European Union members, openness to investment by non-member countries depends on individual countries and often specific treaties they have with non-member countries. Countries like Romania allow non-EU ownership of land based on reciprocity treaties. A careful analysis on a country by country basis should be conducted if an investor is considering purchasing agriculture land.

**Gaining EU Accession requires countries to adopt the EU standards for land tenure and as a result significant land appreciation may occur.** Privatization of government owned agricultural land is a cornerstone to gaining EU Accession. As such, countries like Albania converted *land use rights* for state owned land into full ownership, while in Bulgaria, restitution was used to restore land to the rightful owners. Lithuania, Latvia, and Slovakia joined the EU in 2004 and were granted a seven-year transition period that would limit foreign investment in agricultural farmland while these countries complete the privatization process and develop an efficient market for agriculture land. This transition period was granted due to years of underinvestment in agricultural land and limited sales activity has contributed to excessively low land values. The transition period is designed to prevent wealthier EU nations from scooping up cheap land while the new EU nations are still developing their land market. **We view the continued expansion of the EU positively as more countries privatize government owned land and capital is allowed to flow freely, helping to eliminate the land value differential between countries.**

### Lease Africa but Buy South America

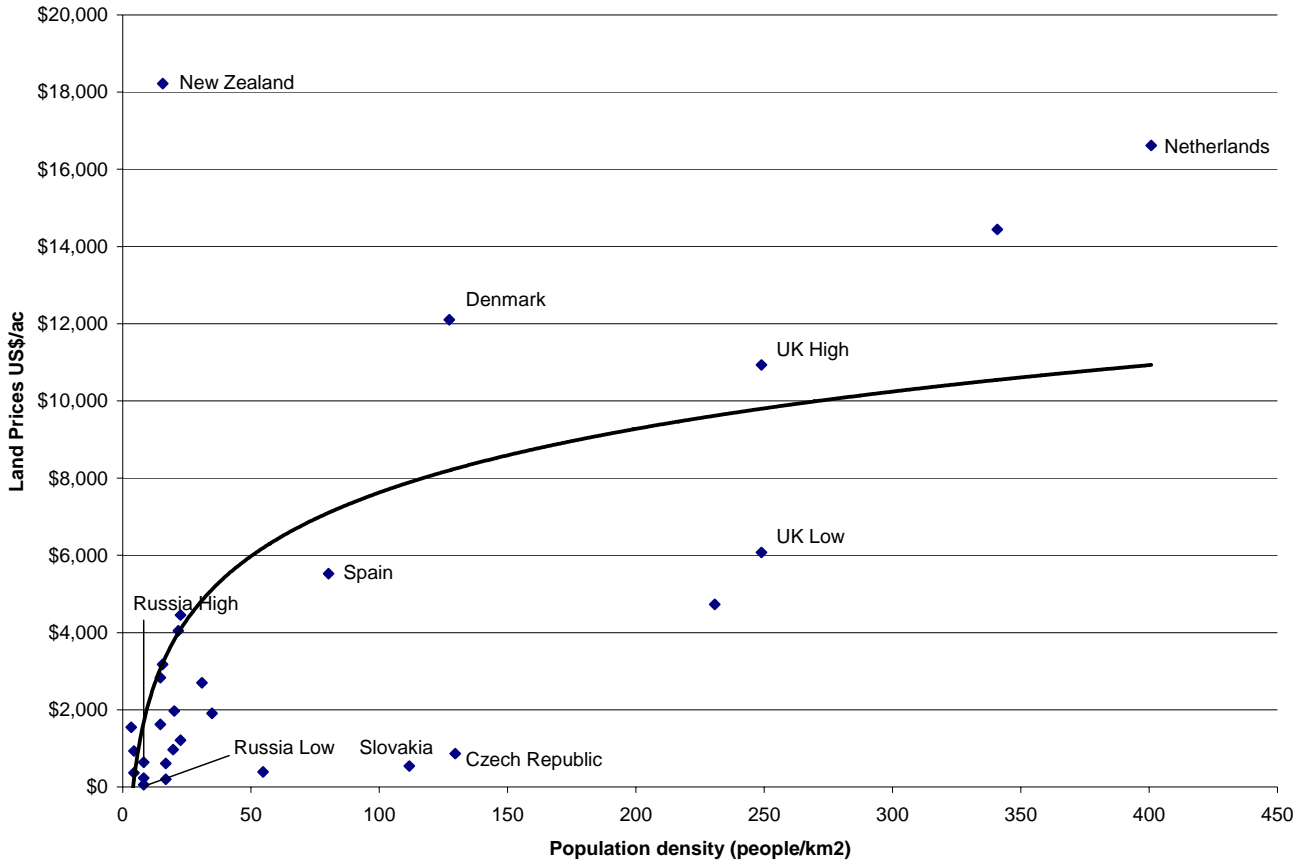
**The ownership structures of Africa and South America are stark contrast to each other with Africa mainly allowing leases, while in South America ownership is the dominant trend.** Africa's history of colonization has resulted in a large amount of agricultural land held by the governments. In most African countries, foreigners can only gain access to the land through long term lease agreements. Current news headlines indicate that farmland in Africa is a hotly contested subject as local unrest brews in countries like Zimbabwe and South Africa where locals are protesting foreign ownership of farmland. This is in sharp contrast to South America where foreign investment is promoted by government and most countries encourage direct ownership in agricultural land. While there are currently strikes in Argentina regarding government imposed export tariffs, South America is, for the most part, a stable farming region.

### *Price of Land: A Function of Population Density, Productive Capacity*

**There is a large disparity in the price of land on a global scale, which is largely a function of the productive capacity of the land, in conjunction with population density (which has ties to access to markets).** Agricultural land is typically the lowest value land on a per acre basis when compared to commercial and residential real estate. As a result, in areas of high density where real estate values in general are inflated, there is upward pressure on agricultural land as

acreage could be converted to a more high-value usage. As can be seen in Exhibit 19, there is a clear correlation between population density and the value of agricultural land.

**Exhibit 19: Land Values Positively Correlated with Population Density**



Source: CIA World Factbook, Savills Research, Eurostat, Union Ag, NZ Farmland Systems Uruguay, Wildhorse Group, USDA, PGG Wrightson

**Beyond population density, the type of productive yield generated from the farmland is the next largest component to determine the market-clearing price of land.** Land rental costs, as a proxy measure for the cost of land, are a relatively small cost of production for farmers regardless of the product of the farmland. The fact that a significant (doubling) move in land prices would have a relatively insignificant (1%-15%) reduction impact on farmer net margins reinforces the ability of land prices to drastically appreciate while still generating attractive returns on investment for the purchaser. Within farming however, there are significant spreads in the cash yield per acre for different crops. In Exhibit 9 we present an example of a low cash yield income statement (grains) versus a high cash yield income statement (vegetables).

**Higher cash yielding crops are associated with higher per acre land value.** In the above example we assume a flat per acre land rent, which highlights the difference in impact between a vegetable crop – the land cost component is 12%

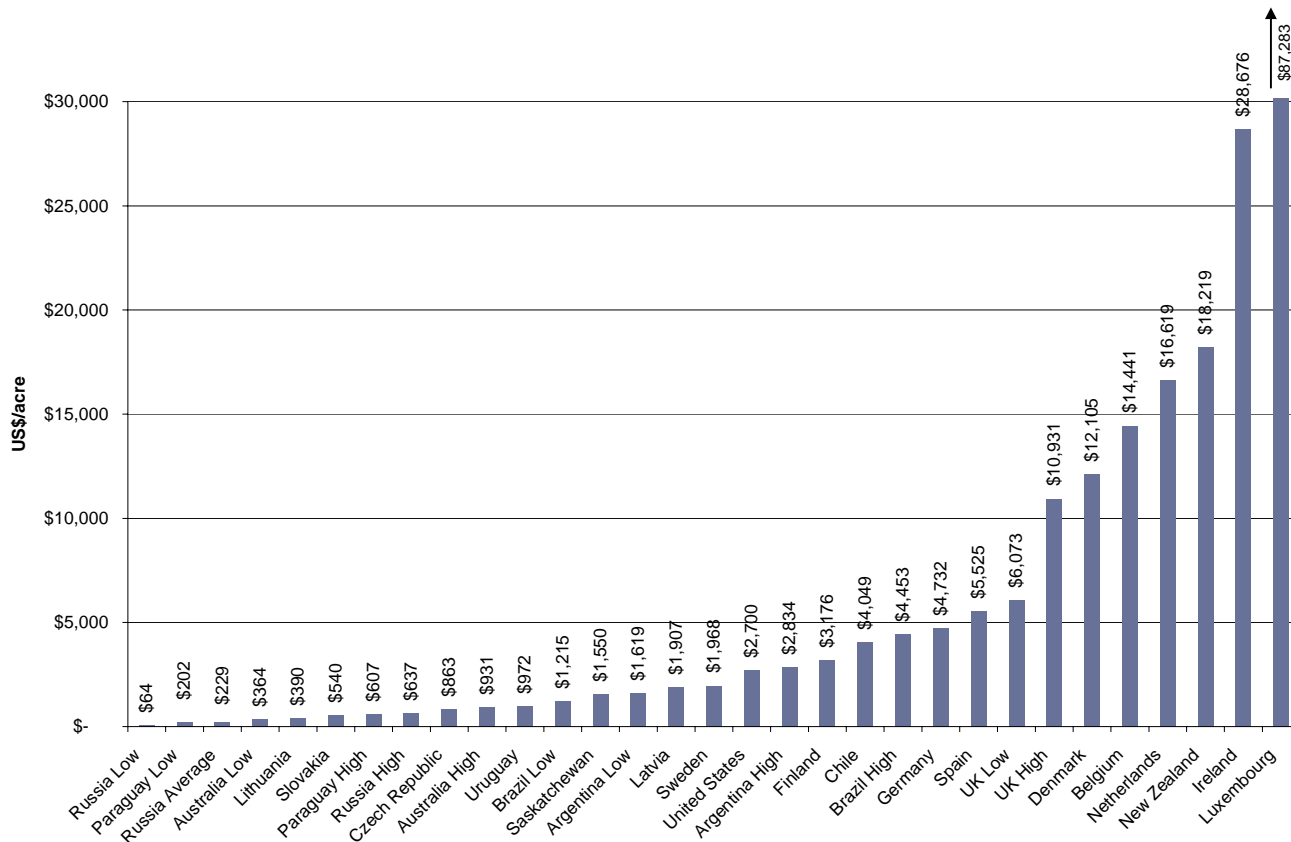
of the revenue per acre for grains as opposed to only 0.8% for the vegetable crop. A sample basket of vegetables, assuming flat labour and land input costs, have cash yields about 11x higher than a representative basket of grain products. As a result, in order to be the same percentage component of revenue - in this example, approximately 15% - land values can be 18x higher for a vegetable crop than a grain crop.

**The caveat for higher cash yielding crops is they often have a significant labour component, or require specialized shipping or storage, suggesting proximity to areas of higher population density.** Far and away the largest cost component for some higher value crops such as vegetables is the harvesting (manual picking), marketing and transportation of the vegetables to market. As a result, the proximity to infrastructure and labour often results in higher inherent land costs, due to competing values of land.

**Overall, we stress that a high cost per acre may not necessarily coincide with a poor investment, and concurrently, cheap farmland does not necessarily mean a buying opportunity.** We believe there are select pockets of farmland that are undervalued relative to comparable countries; however, each case should be evaluated in regards to risks as well as the productive capacity.



**Exhibit 20: Global Farmland Prices – A Wide Range**



Source: USDA, EuroStat, Savills Research PGG Wrightston, NZ Farming Systems, Agra FNP, Union Agriculture Group, Wild Horse Group

***Corruption and Geopolitical Environment: Affects Risk Profile***

Each investment will demand a unique appraisal of the geopolitical risk involved, however we begin to approach the risks associated with Transparency International’s corruption perception index and the Heritage Organization’s index of economic freedom. On a case-by case basis, we evaluate countries in more detail surrounding political stability, strength of the economy, membership in international trade and judicial organizations, etc. As a brief overview, we have presented the Transparency International and Heritage Foundation rankings of the top and bottom countries for corruption and economic freedom, respectively. We have found this to be a good starting point for evaluating the stability of a region.

**Exhibit 21: CPI and Heritage Foundation Top and Bottom Ranked Countries**

Transparency International				Heritage Foundation				Commonly Occurring Countries			
Top 30		Bottom 30		Top 30		Bottom 30		Top		Bottom	
Rank	Country	Rank	Country	Rank	Country	Rank	Country	Rank	Country	Rank	Country
1	Denmark	150	Zimbabwe	1	Hong Kong	128	Niger	1	Australia	1	Bangladesh
1	Finland	150	Kenya	2	Singapore	129	Equatorial Guinea	2	Austria	2	Belarus
1	New Zealand	150	Cote d'Ivoire	3	Ireland	130	Uzbekistan	3	Barbados	3	Central African Republic
4	Singapore	150	Liberia	4	Australia	131	Djibouti	4	Belgium	4	Chad
4	Sweden	150	Sierra Leone	5	United States	132	Lesotho	5	Canada	5	Congo, DR
6	Iceland	150	Ecuador	6	New Zealand	133	Ukraine	6	Chile	6	Equatorial Guinea
7	Switzerland	150	Azerbaijan	7	Canada	134	Russia	7	Denmark	7	Haiti
7	Netherlands	150	Tajikistan	8	Chile	135	Vietnam	8	Estonia	8	Laos
9	Canada	150	Kyrgyzstan	9	Switzerland	136	Guyana	9	Finland	9	Myanmar
9	Norway	150	Kazakhstan	10	United Kingdom	137	Laos	10	Germany	10	Sierra Leone
11	Australia	150	Belarus	11	Denmark	138	Haiti	11	Iceland	11	Tonga
12	United Kingdom	162	Central African Republic	12	Estonia	139	Sierra Leone	12	Ireland	12	Turkmenistan
12	Luxembourg	162	Venezuela	13	Netherlands, The	140	Togo	13	Japan	13	Uzbekistan
15	Austria	162	Bangladesh	14	Iceland	141	Central African Republic	14	Luxembourg	14	Venezuela
16	Germany	162	Cambodia	15	Luxembourg	142	Chad	15	Netherlands	15	Zimbabwe
17	Japan	162	Turkmenistan	16	Finland	143	Angola	16	New Zealand		
17	Ireland	162	Papua New Guinea	17	Japan	144	Syria	17	Singapore		
19	France	168	Guinea	18	Mauritius	145	Burundi	18	Sweden		
20	United States	168	Congo, DR	19	Bahrain	146	Congo, Republic of	19	Switzerland		
21	Belgium	168	Equatorial Guinea	20	Belgium	147	Guinea Bissau	20	United Kingdom		
22	Chile	168	Laos	21	Barbados	148	Venezuela	21	United States		
23	Barbados	172	Chad	22	Cyprus	149	Bangladesh				
25	Uruguay	172	Sudan	23	Germany	150	Belarus				
25	Spain	172	Afghanistan	24	Bahamas, The	151	Iran				
27	Slovenia	175	Uzbekistan	25	Taiwan	152	Turkmenistan				
28	Estonia	175	Tonga	26	Lithuania	153	Burma (Myanmar)				
28	Portugal	177	Haiti	27	Sweden	154	Libya				
30	Israel	178	Iraq	28	Armenia	155	Zimbabwe				
32	Qatar	179	Somalia	29	Trinidad and Tobago	156	Cuba				
33	Malta	179	Myanmar	30	Austria	157	Korea, North				

Source: Transparency International, Heritage Foundation, Wellington West Capital markets Inc.

## Capital Pools Seeking Farmland

**Supporting our thesis of long-term tightness in the soft commodity markets are large pools of capital – both institutional and national – which are looking to secure raw agriculture supply.** In Exhibit 22 we highlight some of the more notable pools of capital currently investing in agriculture land. In broad terms, we can group the funds in three categories:

- 1) **Institutional funds** – seeking investments
- 2) **Sovereign funds** – seeking security of supply
- 3) **Food companies** – seeking security of supply

**We note that the Sovereign funds and Food Companies who are purchasing for the production offtake rather than as a pure investment suggest that the current shortage in food inputs is viewed as a longer term trend by industry experts.** We view it as both telling and promising (for farmland values) that organizations such as San Miguel and countries such as Saudi Arabia and the UAE are investing >US\$2B to merely develop the farmland and have the rights to the production generated.

**Exhibit 22: Large Pools of Capital Seeking Farmland Investments**

Fund	Size (US\$m)	Focus	Year of Inception
Climate Change Capital Land Fund	\$750	Not Specified	2009
<b>Total Invested: 2009</b>		<b>\$750</b>	
Insight Global Farmland Fund (i.e.: "The Merrill Fund" - market)	\$1,000	Cereals/Row Crops (Latin America, Eastern Europe, North America), Livestock (Australia), Dairy (NZ, Latin America), Sugar (Latin America, Africa), Alternatives (Jatropha - Africa, Vineyards - Chile, NZL)	Nov. 2008
The State Trading Corporation of India, Ltd.	Not Specified	Canada, Australia, Paraguay	2008?
Abu Dhabi	Not Specified	Sudan, Vietnam, Cambodia, Africa and South America	2008
San Miguel Corp & Private Investor	\$1,000	Philippines	2008
Schroders Agricultural Land Vehicle	\$500	32% EU, 15% South America, 13% Australia, 9% Ukraine, 7% Russia, 6% Canada and commodities	2008
Emergent Asset Management	\$4,300	Sub-Saharan Africa	2008
Dexion Capital PLC	\$270	South America, Australia and Russia	2008
Galtere	\$250	US, Brazil, Argentina	2008
Alaska Retirement Management Board	\$240	U.S. Farmland	2008
Agroenergy AG	\$157	Germany	2008
George Washington University	\$100	Not Specified	2008
Calyx Agro	\$65	Brazil	2008
Braemar UK Agricultural Land plc	\$40	Britain	2008
Agriculture Development Corp.	\$32	Saskatchewan	2008
<b>Total Invested: 2008</b>		<b>\$7,954</b>	
Abraaj Capital	Not Specified	Pakistan	2007
TIAA-CREF	\$340	U.S. Farmland	2007
Blackrock Inc	\$200	70% equity, 15% commodities 15% invested in farmland	2007
GlobalAgriCap Fund	\$33	33% U.S., 23% Europe, 30% Asia, 14% rest of world	2007
<b>Total Invested: 2007</b>		<b>\$573</b>	
Campos Orientales	Not Specified	Uruguay	2006
Elana Agricultural Land Fund Opportunity Fund	\$75	Bulgaria	2005
Advance TerraFund	\$67	Bulgaria	2005
Brascan Asset Management	Not Specified	365,000 acres in Brazil	1995
UBS AgriVest LLC	\$180	66,000 Acres of U.S. Farmland	1991
Westchester Group	\$400	70,000 Acres of U.S. Farmland	1986
Hancock Agricultural Investment Group	\$940	140,000 Acres in U.S., 7,600 Acres in Australia	1981
Pergam Finance	\$1,000		
<b>Total Invested: Pre-2007</b>		<b>\$2,662</b>	

NB: *Italics* indicate when fund began focusing on farmland investments - fund inception in these cases is much earlier than the date listed.

Source: Company Reports, Press Releases, Wellington West Capital Markets Inc.

**Exhibit 23: San Miguel; \$1B to Upgrade Land, Expecting Long-Term High Prices**

San Miguel, the largest food and drink maker in the Philippines, has partnered with the Malaysian Kouk Group to deploy US\$1B in order to develop 1,000,000 hectares and thereby raise the yield of rice and corn among other crops in the Philippines. The stated goal is to ensure security of food supply for both the company and the nation itself. Chairman and CEO Eduardo Cojuangco has stated that "[t]here's no more important issue today that food security. We're prepared to help. We understand that guaranteeing food supply is an important strategic goal for everyone." The company believes that "[f]ood crop prices are expected to remain **at extraordinary levels through 2010 and remain high for at least a decade**," according to the Chairman.

The investment will be made via a 70/30 debt/equity split, and will be used to upgrade existing facilities in order to generate improved yields but not purchase the land which will continue to be owned by the government. San Miguel will then have the right to purchase the raw yield from the upgraded farmland.

Source: AP, WSJ, Philippine Daily Inquirer, Wellington West Capital Markets Inc

**There has been a recent emergence of multiple publicly-listed corporate farms.** We currently include in our corporate farm universe 10 companies with operations spanning the globe, from Uruguay to Russia, and involved in operations from dairy to blueberries to grains. Of note, 2/3rds of the companies have IPOed in the past 18 months, with all but one having gone public since the beginning of 2005. The exception is Cresud, a Brazilian concern that has been in operations since 1974. Although a public offering is sometimes correlated with opportunistic management taking cues in the commodity cycle to maximize valuation, these companies also seem to be aggressively expanding their land holdings – reinforces our thesis of land as an emerging asset class.

### Exhibit 24: Emerging Public Corporate Farms

In US\$ unless otherwise noted Company Name	Bloomberg Ticker	Share Price	Shares o/s (mm)	Mkt Cap. (\$mm)	EV (\$mm)	Primary Country	IPO			% Of Raised Proceeds invested	Price/NAV	EV/EBITDA	
							Date	Price	Return Since IPO			F08E	F09E
<b>South America</b>													
NZ Farming Systems	NZS NZ	\$1.14	244	\$278	\$245	Uruguay	12/18/2007	\$1.13	1%	75%	1.2x	n/a	18.9x
SLC Agricola SA	SLCE3 BZ	\$15.14	103	\$1,558	\$1,393	Brazil	6/14/2007	\$7.26	109%	60%	4.5x	16.2x	15.1x
BrasilAgro	AGRO3 BZ	\$6.23	58	\$364	\$210	Brazil	2/15/2006	\$4.83	29%	41%	1.0x	n/a	68.7x
Cresud Inc	CRES AR	\$1.15	501	\$574	\$404	Argentina	30/08/2002*	\$0.50	129%	n/a	1.0x	32.9x	33.7x
Union Agriculture	n/a	\$1.40	54	\$75	\$75	Uruguay	n/a	n/a	n/a	0%	1.1x	n/a	n/a
<b>South America Average**</b>										<b>59%</b>	<b>1.1x</b>	<b>24.5x</b>	<b>22.6x</b>
<b>Eastern Europe/Russia</b>													
Agrowill Group AB	AVG1L LH	\$2.77	26	\$72	\$110	Lithuania	4/2/2008	\$2.26	22%	n/a	3.4x	n/a	n/a
Black Earth Farming Ltd.	BEFSDB SS	\$4.68	124	\$583	\$358	Russia	12/25/2007	\$7.92	-41%	37%	1.3x	14.8x	4.5x
Landkom International	LKI LN	\$1.17	200	\$234	\$150	Ukraine	11/22/2007	\$1.07	9%	11%	1.7x	n/a	11.6x
KTG Agrar	7KT GR	\$23.43	4	\$101	\$137	Germany	11/15/2007	\$25.62	-9%	n/a	2.4x	7.0x	6.1x
Trigon Agri	TAGR SS	\$1.59	130	\$206	\$105	Russia	5/17/2007	\$1.68	-6%	14%	2.0x	6.0x	1.5x
OAO Razgulay Group	GRAZ RU	\$6.79	120	\$815	\$1,274	Russia	11/21/2005	\$3.59	89%	52%	1.2x	6.9x	5.6x
<b>Eastern Europe/Russia Average**</b>										<b>28%</b>	<b>1.7x</b>	<b>8.7x</b>	<b>6.9x</b>
<b>North America</b>													
Wild Horse Group	n/a	\$0.85	30	\$26	\$21	Canada	n/a	n/a	n/a	0%	1.4x	n/a	n/a
<b>North America Average</b>										<b>n/a</b>	<b>1.4x</b>	<b>n/a</b>	<b>n/a</b>
<b>Entire Universe Average**</b>										<b>41%</b>	<b>1.4x</b>	<b>15.5x</b>	<b>13.6x</b>

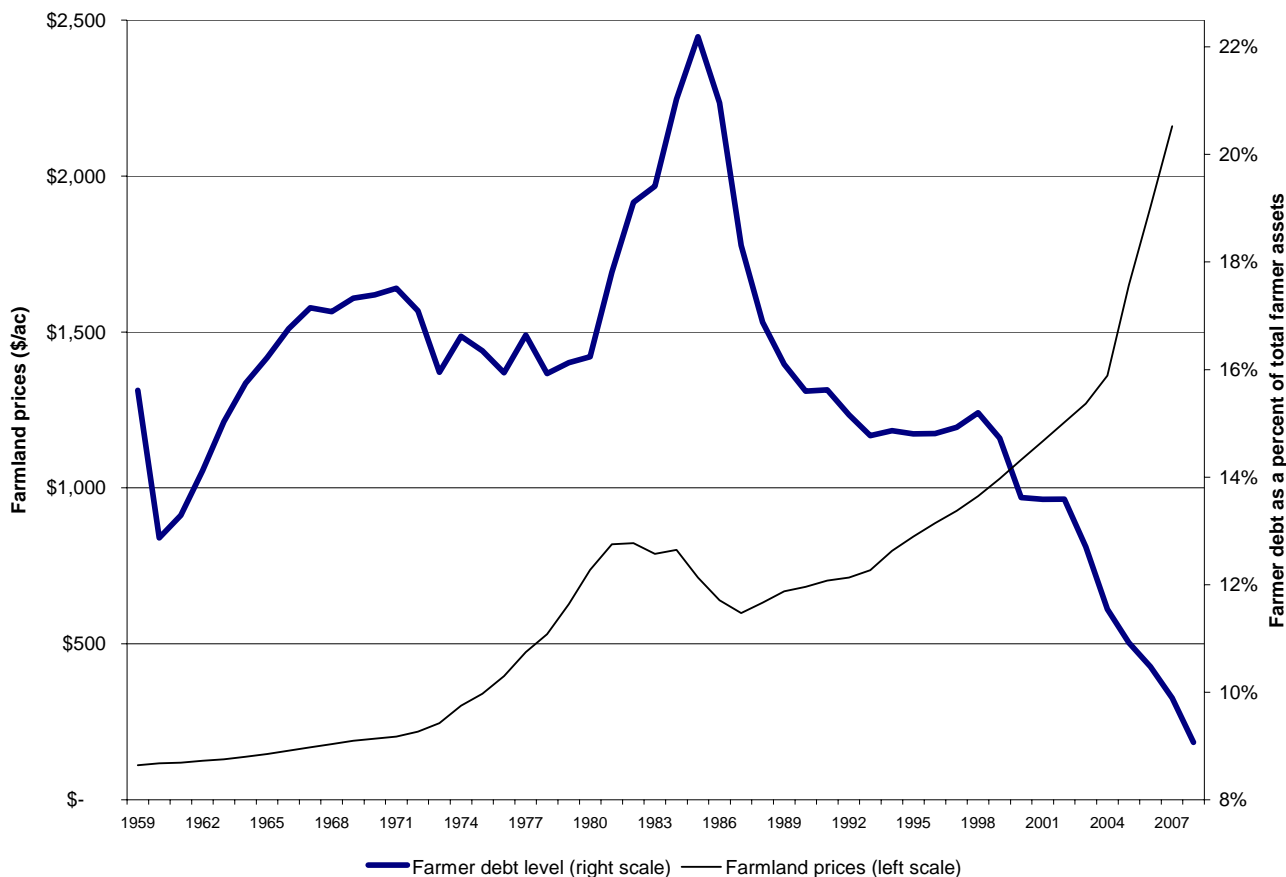
Source: Company Reports, Bloomberg, Wellington West Capital Markets Inc.

## Key Risk to Farmland Appreciation Thesis

### *High Leverage with a Commodity Correction*

**Land prices, after a period of excessive growth, retracted in the early 1980s during a time that coincided with not only falling commodity prices, but was also compounded by drastically elevated farmer leverage.** After a decade of sustained high farmer income and elevated farmland values, the U.S. farmer began to tack on leverage, resulting in debt levels hitting a record peak of 22.2% of assets in 1985. As the debt levels began the approach 20% of assets, farmland values leveled off, and then retracted over a period of five years (Exhibit 25). The run in debt levels to greater than 22% of assets came after a 12 year period of 14% y/y farmland price appreciation, when farmers began to believe farmer income, and farm values, would rise indefinitely.

**Exhibit 25: Low Debt Levels Suggest Plenty of Room for Further Price Appreciation in Land**



Source: USDA, Bureau of Economic Analysis (U.S. Dept. of Commerce), WWCM Inc.

**Farmer leverage is currently at a 49 year low, suggesting that farmland prices have not been buoyed by excess debt, and setting the stage for a period of continued high value appreciation.** From the 1985 peak debt of 22.2% of assets, farmers have steadily reduced their debt exposure with 23 years of almost uninterrupted reductions in debt-to-assets. As shown in Exhibit 25,

there has been a year over year reduction in debt-to-assets every year since 2002, resulting in a 48 year low in leverage estimated at a debt-to-asset ratio of 9.1% in 2008. We believe that higher debt levels may occur at a later point in the cycle, potentially indicative of an emerging land bubble, as investors and farmers borrow heavily against potential future land price appreciation.

**A period of higher leverage in the early 1980s coincided with retracting soft commodity price, which occurred when inventory skyrocketed from ~75 days to over 125.** Coinciding with the rising farmer debt levels from 1980 to 1985, was the price destruction of the soft commodities as wheat pulled back from a ten year peak of \$5.38/bu (unadjusted) to \$2.46/bu in June of 1986. As shown in the WASDE (World Agricultural Supply and Demand Estimate) report, inventories had been on the rise, and spiked during this five year period, which was likely the main driver behind the soft commodity price destruction. Currently, we are in a period where soft commodity stocks-to-use ratios are near 35 year lows, implying a period of continued high prices and supporting farmer income levels at rates above the recent past.

## Appendix I: Major Soil Constraints

Adapted from *Land Resource Potential and Constraints at Regional and Country Levels*, FAO; Land and Water Development Division (2000)

The FAO uses eight soil characteristics to determine the fertility of the soil in a given region, based largely on the fertility capability classification.

### ***Hydromorphy – poor soil drainage***

Usually flat and low-lying relative to surrounding lands, this is soil which is wet for all or most of the year. Areas with high (>50%) of Hydromorphy include the Falklands, the deltaic zone of the Ganges in Bangladesh and the combination of peat moors, fenlands and clay vales in the United Kingdom. Less intense but still globally high countries include Luxembourg, Ireland, Cambodia and Belarus. Tropical regions with moderate hydromorphy and tropical or sub-tropical climates can be used for rice production with temperate regions yielding grass or pasture land.

### ***Low cation exchange capacity – low capacity to retain nutrients***

These are topsoils with low organic matter or low clay content resulting in a low inherent fertility and reduced/low capacity to retain added fertilization. Globally, of the 12 countries with >15% of their land hindered by low cation exchange capacity, 11 are in Africa (the other being Kuwait) highlighting the challenging conditions of the region. Although artificially stimulating the soil with nutrients may temporarily increase the yield, the practice will likely be uneconomic as a result of the low retention of fertilizers – an abnormally large amount must be added year over year to achieve satisfactory yields.

### ***Aluminium toxicity – strong acidity***

This constraint is present in soil which has high alumina content, resulting in a pH of less than 5.0-5.5, typically from high leaching due to excessive rainfall. As a result, it mostly occurs in the tropics. Some crops do have a higher level of tolerance such as tea and pineapple, but the acidity can hinder or prohibit yields of some cereal products. We do note that as a result of the widespread nature of aluminium toxicity there is research which is pursuing plant variations which can thrive in high aluminium. In particular, research at Cornell University has resulted in a sorghum crop which may survive in pH 5 soil.

### ***High phosphorus fixation – high level of ferric oxides in the clay fraction***

This constraint is highly linked to aluminium toxicity as the significant presence of ferric oxides ( $\text{Fe}_2\text{O}_3$ ) also reduces the pH. We note that although our 'preferred country' map highlights Brazil as well as Guyana and Suriname, regions in these three South American countries do have a propensity to suffer from high phosphorus fixation.

***Vertic properties – cracking clays***

These soils, although high in organic content and chemically fertile, have complex physical properties which cause the soil to puff out when wet, and then shrink when dry – resulting in large cracking. Distribution within any given country is highly localized with the largest contiguous tracts in India, Australia and the Sudan. Countries with high proportion of vertic properties vs. total arable land include Uruguay, India and Puerto Rico.

***Salinity and sodicity – presence of free soluble salts***

Salinity (sodicity) is simply the high level of salt (sodium ions) in the soil resulting in difficult or impossible growing conditions, largely as a result of improper irrigation or drainage. Areas especially prone to salinity are typically in a somewhat contiguous belt from the Sahara through the Middle East and onward into south/central Asia.

***Shallowness – rock or a rock-like horizon close to the soil surface***

The FCC classification requires soil (non rock or rock-like) for the first 50cm of depth. Excepting areas which have insufficient growing seasons for our purposes (polar), shallow soil typically is present in areas of high slope. We note Slovenia, Armenia and Kyrgyzstan as the three main culprits.

***Erosion hazard – high risk of soil erosion***

Although somewhat self explanatory, the FAO defines areas of erosion hazard as either very steep (>30%) or steep (8-30%) combined with soil composition which changes rapidly – leaving it prone to erode rapidly. Switzerland, Macedonia and Georgia would be examples of countries which have greater than 30% average inclination.



## Appendix II: High Quality Soils of the World

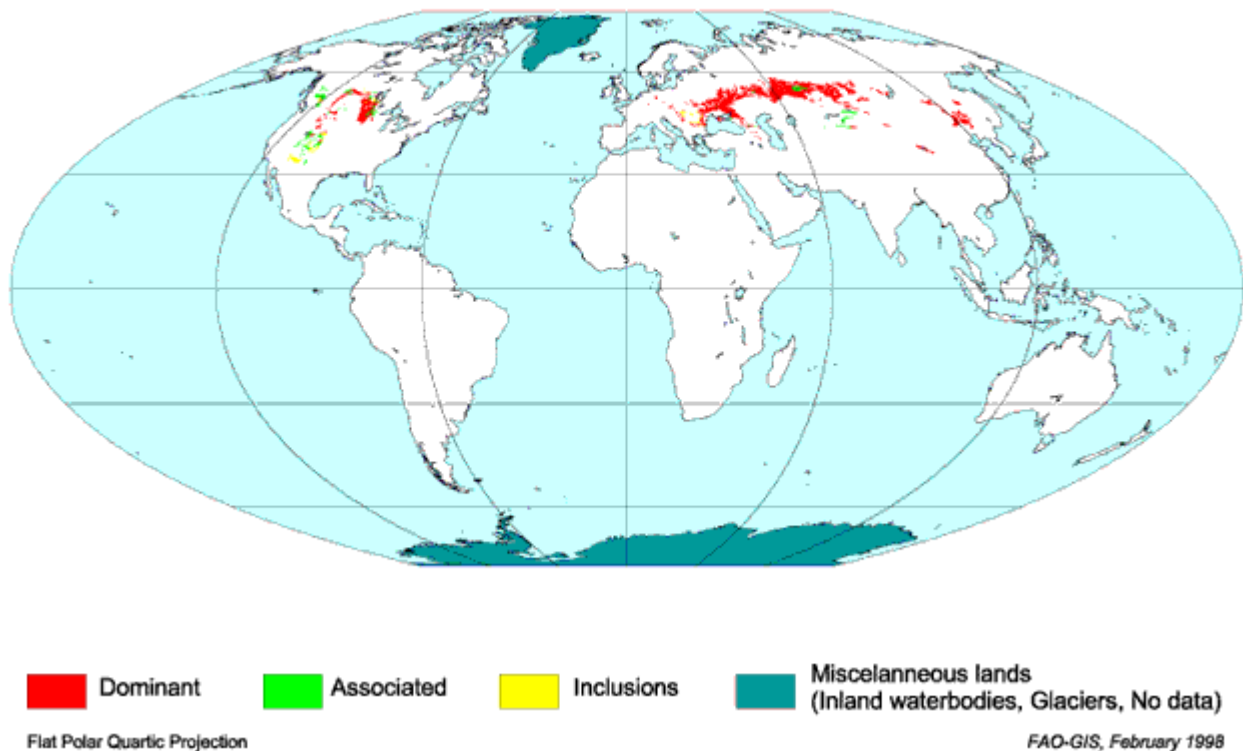
The two soil types with arguably the highest productive output for agriculture are chernozems and kastanozems – in layman’s terms, these classifications would be ‘thick, dark topsoil.’

### Chernozems:

Chernozems are widely considered to be the best quality agriculture soil, consisting of thick, black topsoil, high in organic (humus) matter, and lacking saltic properties. Chernozem is derived from the Russian *chernyl* meaning “black” and *zemlya* meaning “earth.” Indeed, as can be seen in the map below, the largest contiguous region of chernozems stretches across eastern Europe and through the south of Russia, not coincidentally referred to as the “Black Earth region.” Outside of the Black Earth region, the most prolific accumulation of chernozems is the Canadian prairies (Saskatchewan), stretching somewhat down into the U.S. Midwest.

### Exhibit 26: Global distribution of Chernozems

**Distribution of CHERNOZEMS**  
 Based on WRB and the FAO/Unesco Soil Map of the World



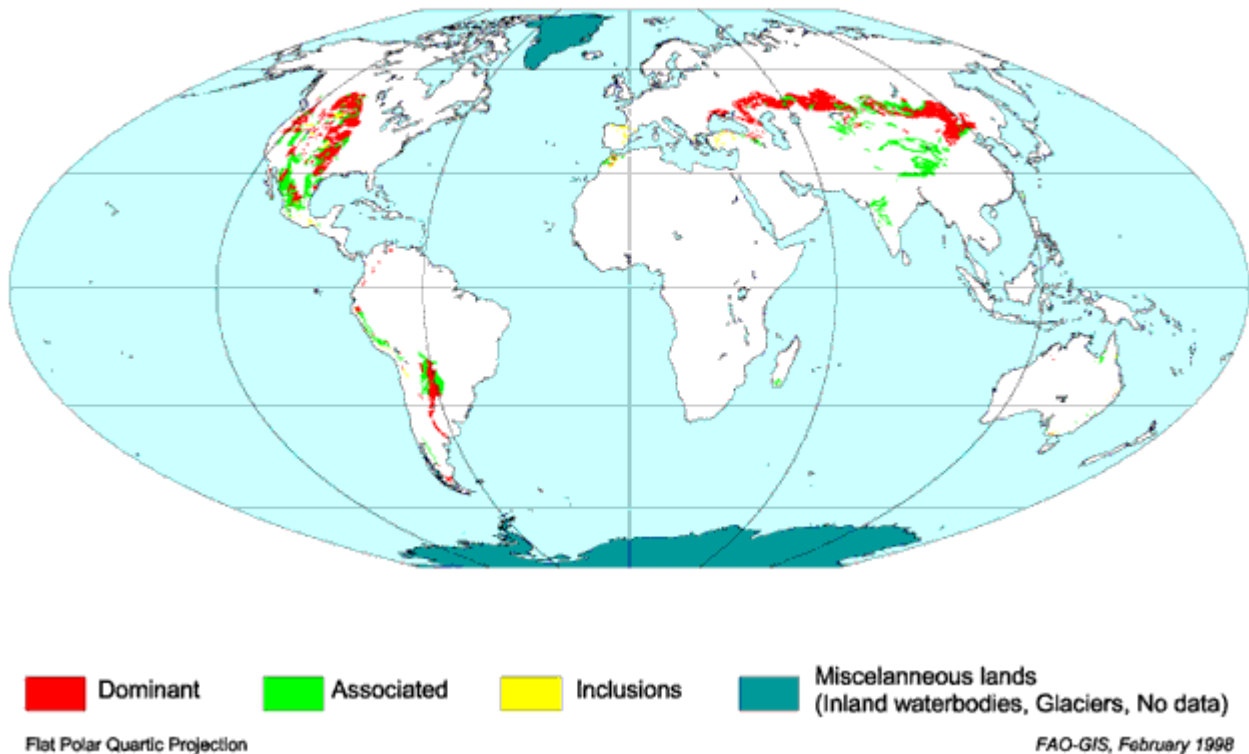
Source: FAO

### Kastanozems:

Kastanozems are closely related to chernozems, having similar high levels of organic compounds, but are typically coloured dark brown as opposed to black. This is partially due to the presence of one or more calcic or gypsic horizons or powdered lime. The color gives rise to the etymology of the name, from the Greek word for chestnut, roughly “kastano” and Russian for earth; “zemlya.” The main yield-limiting characteristic for kastanozems is a lack of soil moisture. As a result, irrigation is critical for all applicable crops giving rise to potential risk of hypersalinization from leaching if not properly applied. The most prominent location for kastanozems is similar to the chernozem region, across southern Russia, and down the central plains of North America.

### Exhibit 27: Global distribution of Kastanozems

**Distribution of KASTANOZEMS**  
 Based on WRB and the FAO/Unesco Soil Map of the World



Source: FAO

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