

# INCLUSION OF FARMLAND IN A DIVERSIFIED INVESTMENT PORTFOLIO – LITERATURE SUMMARY

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Laguna Bay Fund 1 Pty Ltd  
PO Box 1544  
Noosa Heads QLD 4567  
Australia  
+61 7 5334 1011



Brookvine Pty Limited  
2/60 Moncur Street  
Woollahra NSW 2026  
Australia  
+61 2 9328 6445

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# 1. SUMMARY

This document summarises the results of a review of academic and other literature regarding the inclusion of farmland in a diversified investment portfolio. It also includes an analysis of the investment policy statements of select United States pension and endowment funds that have made an allocation to farmland.

## 1.1. International Literature

International literature provides strong support for the following propositions:

1. Farmland should form a meaningful share of an investment portfolio.
2. Unlike infrastructure or real estate, the supply of farmland is fixed or shrinking despite growing demand for food. The studies note that with limited potential for new supply, premier farmland should become increasingly valuable.
3. Farmland returns have provided a more than adequate risk-adjusted return and have, depending on the time period and study, delivered long-term returns as good as or higher than those of stocks and bonds.
4. Farmland returns are negatively correlated with returns from stocks and bonds.
5. Farmland returns are positively correlated with inflation and so provide a good inflation hedge; stock and bond returns are negatively correlated with inflation.
6. Farmland investment returns have a very different set of drivers to those for stock and bond returns.
7. Farmland returns include a significant amount of annual cash flow that, across a well-diversified portfolio, has low volatility.
8. The addition of farmland to a traditional diversified portfolio of stocks, bonds and REITS has benefits in relation to both returns and risks.
9. Risks associated with investment in agriculture are best managed through diversified investment across regions where rainfall is not correlated and across sectors where commodity prices are uncorrelated.
10. The portfolio benefit of farmland relates more to the enhancement of annual cashflow and risk reduction than return enhancement.
11. The prospects for future returns in farmland are likely greatest in regions/ countries going through adoption of new technology (and systems of farming) whereby input values become capitalized in land from past technology and new technology increases the value of inputs (land).

## 1.2. Australian Literature

The Australian literature provides strong support for the diversification benefits of Australian agriculture, identifies out-sized operating returns for the top 20-25% of Australian farm producers, substantiates long term, broad based capital appreciation of at least 5% p.a. and makes the case that the market is fragmented and inefficient for the lack of institutional investment. The literature provides strong support for the following propositions:

1. Australian institutional investors are significantly under-invested in agriculture and foreign investment is marginal.
2. Yet foreign investors are more likely to purchase agricultural assets than domestic counterparts, and these local assets may be an unrealised opportunity for capital.

3. The lack of investable products and the lack of asset managers specialising in agriculture are amongst the most important obstacles to investment by Australian superannuation and pension funds in the sector. As well, the agriculture industry is not a focus of local asset consultants.
4. Not surprisingly, the Australian agriculture sector is a highly inefficient and fragmented market, and presents an excellent opportunity to extract value.
5. Australian agriculture is not correlated to equities and provides a strong inflation hedge.
6. The top 25% of Australian agriculture producers have produced returns significantly above 'median' and almost as good as Australian shares in the past, suggesting there is considerable 'alpha' potential in the asset class.
7. One study, over a 32 year period, noted an average total return of 10-12% p.a. for the top 25% Australian farmers. Another noted that the top 25% of Australian consistently produced a cash ROI of 10% or above for the decade-long period of the study, despite seasonal and commodity price volatility. Another noted that the top 20% of Australian farmers, in key sectors, are achieving average annual returns that are more than double the average farmer in the same location.
8. Returns from the top 25% of Australian agriculture producers are substantially less volatile than Australian shares, listed property and international shares.
9. Whilst the top 25% of performers produce higher returns, the capital growth is similar for the better and poorer performers, suggesting that cash returns do not of themselves drive land price growth – unless the particular farming systems employed become widely adopted or productivity gains can otherwise be capitalised into land prices.
10. Over the 20 year period to 2015 the average annual median price growth (capital appreciation only) of Australian farmland was 5.8%. Performance over the past 10 years (3.2% p.a.) lagged this average, however recent performance (2015: 5.3%) was again in line with longer term averages.

### **1.3. Investment Policy Statements**

The investment policy statements of US pension and endowment funds reviewed for this paper indicate that Farmland/ Agriculture is increasingly a well-accepted asset class which is often included in a 'Real Assets' or 'Natural Resources' allocation. There is an acknowledgement of the merits of farmland on the following basis and with the following presumptions:

1. Inflationary Hedge: Farmland provides an inflationary hedge as it tends to appreciate with inflation and reduce overall volatility.
2. Diversification Benefits: A diversified farmland portfolio is counter-cyclical with other asset classes. It typically has a low or negative correlation with other components of a typical endowment or pension portfolio based on long-term performance data, resulting in substantial diversification benefits.
3. Real Return Target: Farmland is expected to deliver a total real return in the order of 5-6% p.a.
4. High Income Component: Farmland investments have an income component (e.g. 40%-65% of total return) which many pension and endowment funds find very attractive to help defray benefits costs and operating expenses.
5. Current Underinvestment: The current market provides an attractive entry point (attractive valuations) following years of underinvestment by institutional investors.
6. Rising Global Demand for Raw Materials: The economic growth and rising income in China (China's boom) and other emerging nations (i.e. India) has increased demand for agricultural commodities.

7. Active Management: There is considerable opportunity for active management and merits in the use of 3<sup>rd</sup> party investment managers to capture the highest attainable investment return.
8. Diversification: Farmland investments can be diversified across geography, crop type (e.g., row crop vs. permanent crop), management style (e.g., lease vs. operate), and property size.
9. Use of Leverage: Farmland is suitable for the use of modest leverage.

## 2. REVIEW OF INTERNATIONAL LITERATURE

### 2.1. **Songjiao Chen, et al., 2013, “Investing in Agriculture as an Asset Class”, North Dakota State University Department of Agribusiness & Applied Economics. Available [here](#).**

This paper provides a comprehensive review of the literature on the inclusion of farmland in a portfolio. Its conclusions include:

- All of the studies point to the fact that farmland should form a meaningful share of an investment portfolio. They show that agriculture is attractive as it has favourable returns, low risk, and returns are negatively correlated (or, uncorrelated) with equities and bonds, providing diversification that is especially desirable when market volatility causes correlations between traditional assets to converge.
- Returns come from a different set of demand drivers, including increasing world population, changing consumption patterns in emerging markets, and the increasing scarcity of arable land. Unlike infrastructure or real estate, the supply of farmland is fixed or shrinking despite growing demand for food. The studies note that with limited potential for new supply, premier farmland should become increasingly valuable.
- Historical returns from farmland are driven by a significant amount of annual cash flow that, across a well-diversified portfolio, has low volatility/ variability.
- The prospects for future returns in farmland are likely greatest in regions/countries going through adoption of new technology (and systems of farming) whereby input values become capitalized in land from past technology and new technology increases value of inputs (land).

### 2.2. **Lins D.A, et al., 1992 “Institutional Portfolios: Diversification through Farmland Investment”, Journal of American Real Estate and Urban Economics Association. 1992 V.20.4 pp.549-571 Available [here](#).**

The paper concludes that for the period 1967-88, US farmland exhibited a higher return than stocks and bonds. It also found that farmland returns were negatively correlated with stocks and bonds but positively correlated with inflation. Stocks and bonds, on the other hand, had a negative correlation with inflation.

### 2.3. **Hennings E., et al., 2005 “Portfolio Diversification Using Farmland Investments” delivered at the American Agricultural Economics Association Annual Meeting. Available [here](#).**

The paper concludes that one of the main advantages of farmland is that it behaves differently from traditional stock indices and bond markets, providing a natural protection tool against market volatility. It also found that farmland returns are negatively correlated with stocks and bonds and positively correlated with inflation and therefore it may be used by investors to reduce risk in times of higher inflation. Farmland may also provide investors with considerable in-class diversification, for example, by including investments from different geographical regions.

Finally, the study showed that the contribution of farmland to portfolio diversification is consistent across different portfolio restrictions and strongly indicates, using three alternative measures for farmland real estate assets, that farmland significantly improves portfolio performance.

### 2.4. **Kaplan, H.M, 1985. “Farmland as a Portfolio Investment”, The Journal of Portfolio Management, Winter 1985. Available [here](#).**

The paper concludes that farmland is an excellent hedge against inflation and compares farmland index returns to other benchmarks and demonstrates the gains delivered by diversifying into farmland. The paper also concludes that investors in farmland could significantly and sufficiently reduce [farmland] portfolio volatility by diversifying across no more

than five farmland assets in different regions, on the proviso that this includes mix-farming operations.

- 2.5. Nartea, G.V. et al., 2005, “Role of Farm Real Estate in a Globally Diversified Asset Portfolio”. Available [here](#).**

The paper concludes that the predominantly negative correlation between financial assets and farmland means that an addition of farmland to a portfolio of financial assets can improve the risk-return trade-offs significantly. The portfolio benefit of farmland relates more to risk reduction than return enhancement.

- 2.6. Coleman, L. 2007, “Applying Modern Portfolio Techniques to Agriculture”, FINSIA Journal of Applied Finance, 2007, Issue 4. Available [here](#).**

The paper concludes that the risks associated with investment in agriculture are best managed through diversified investment across regions where rainfall is not correlated and across sectors where commodity prices are uncorrelated. The paper also concludes that about a third of investment returns are specific to projects, so these need to be chosen based on sound fundamentals and favourable valuations.

- 2.7. Johnson, M. et al., 2006, “The Role of Agribusiness Assets in Investment Portfolios”, Australasian Agribusiness Review, 2006, Vol. 14, Paper 11. Available [here](#).**

The paper investigates the diversification benefits of including agribusiness assets in two investment portfolios, a mixed asset portfolio and a diversified share portfolio. Using Markowitz's (1952) MPT mean-variance portfolio optimisation techniques, the study shows that agribusiness assets provided diversification benefits in both the mixed asset and diversified share portfolios. The study also shows that agribusiness assets enter the efficient portfolios at lower levels of risk, with allocations declining at higher risk levels.

- 2.8. Painter, M., 2015, “Assessing the Required Risk Premium for North American Farmland Investment”, ASFMRA. Available [here](#).**

This paper compares the investment risk of farmland with other investment options such as bonds, stocks, gold, oil and real estate using several methods of risk analysis, including overall yield variance, CAPM, Value at Risk (VAR), and Drawdown. The paper concludes that the North American Farmland REIT has less risk than gold, oil, REITs and stock markets.

- 2.9. Painter, M., 2013, “North American Farmland Investment Performance Assessment Using E-V Analysis, CAPM and Value at Risk”, delivered at the 19th International Farm Management Congress in Warsaw, Poland. Available [here](#).**

The paper finds, based on a study of the period 1972 to 2011, North American farmland investment yields have been very competitive with stocks, bonds and real estate. The paper also concludes that given its competitive yield, the inclusion of farmland can enhance investment performance of a diversified portfolio.

- 2.10. Painter, M. 2015, “Gold, Black Gold, and Farmland: should they all be part of your Investment Portfolio?”, International Journal of Agricultural Management, Volume 2 Issue 2A: 100-112. Available [here](#).**

This study shows that for the period 1972–2011, financial performance was significantly improved with the addition of farmland real estate investment trusts (F-REITs), gold and oil to a portfolio of traditional investments of T-bills, bonds, stocks and REITs. The main benefit of the inclusion of F-REITs for the non-farmer investor and institutional investors is another asset choice with excellent diversification and inflation hedge benefits offering a dividend yield.

### 3. REVIEW OF AUSTRALIAN LITERATURE

#### 3.1. **Australian Agribusiness Group, 2013 “Top 25% Agri – Secure Performance.” Available [here](#).**

This paper concludes that:

- Australian institutional investors have under-invested in agriculture because of perceptions of high risk and poor returns. This paper demonstrates that quite the reverse is true.
- The top 25% of Australian agriculture producers have produced returns significantly above ‘median’ and almost as good as Australian shares in the past, and probably have stronger tailwinds going forward given Asian demand for food production.
- Returns from the top 25% of Australian agriculture producers are substantially less volatile than Australian shares, listed property and international shares.
- Whilst the top 25% of performers produce higher returns the capital growth is similar for the better and worse performers, suggesting that cash returns do not of themselves drive land price growth – unless the particular farming systems employed become widely adopted or productivity gains can otherwise be capitalised into land prices.
- Given different drivers of return, Australian agriculture is not correlated to equities and provides a strong inflation hedge.
- The addition of an Australian agricultural investment to a portfolio can substantially reduce volatility for a limited (if any) reduction in overall returns.

#### 3.2. **Eves, C, 2011, “The Role of Institutional Rural Property in Diversified Investment Portfolios in NSW, AUSTRALIA”, Pacific Rim Property Research Journal, Vol 17, No. 2, 2011. Available [here](#).**

The paper analyses rural property sales in New South Wales for the period 1990-2008, and compares total return performance across a number of rural property sectors based on geographic location and land use type. The paper concludes that the inclusion of rural property in an investment portfolio has benefits in relation to both return and risk. It also summarises the findings of previous papers by Eves (2010, 2004, 1997) that have shown that rural property returns vary significantly from both a land use and geographic basis, providing the opportunity to reduce overall risk by diversification. Finally, the paper also acknowledges work by other parties (The Australian Farm Institute, 2009), that reported on the enormous variation in returns between the top 25% of Australian farmers and the rest, noting that the top 25% of Australian farmers have consistently shown a cash ROI of 10% or above for the past decade, despite seasonal and commodity price volatility.

#### 3.3. **Eves, C, 2015, “The Analysis of NSW Rural Property Investment Returns: 1990-2014”. Available [here](#).**

The paper notes that, although rural land in Australia represents over 50% of the total land area of Australia and still plays an important role in relation to trade and overall GDP, the focus of rural property from a property and investment perspective has not been as significant as other property sectors. Foreign investment is, as yet marginal (between 2 to 4%). The paper noted that, over the period 1990-2014, the average annual capital growth for rural property in NSW has been 4.5% (5.5% weighted average). However, the top 20% of NSW rural producers in key sectors are achieving average annual returns that are more than double the average farmer in the same locations. These high returns underpin the importance of these high performing rural properties as targets for both national and international investment institutions.



**3.4. BDO Accountants, 2015, “An Analysis: Australian Superannuation Fund Investment in Agriculture 2014/15. Available [here](#).**

The paper finds that the Australian agriculture sector is a highly inefficient, mostly fragmented market, with low liquidity and a need for active management. These conditions have historically presented an excellent opportunity to extract value. It is also underinvested by Australian superannuation and pension funds as agriculture has not traditionally been considered in the make-up of an investment portfolio. The lack of investable products and the lack of asset managers specialising in agriculture are identified as the most important obstacles to investment in the sector. As well, the agriculture industry is not a focus of asset consultants. The paper concluded that foreign investors are more likely to purchase agricultural assets than domestic counterparts, which means these local assets may be an unrealised opportunity for capital.

**3.5. Rural Bank, 2015, “Australian Farmland Values 2015”. Available [here](#).**

The report finds that over the prior 20 years the average annual median price growth (capital appreciation only) of Australian farmland was 5.8%. Performance over the past 10 years (3.2% p.a.) lagged this average, however recent performance (2015: 5.3%) was again in line with longer term averages.

## 4. REVIEW OF INVESTMENT POLICY STATEMENTS

The following is a sample of Investment Policy Statements that deal specifically with the implementation of an allocation to farmland from a select group of North American endowment and pension plan investors. These Investment Policy Statements are publically available via the websites of each institution.

### 4.1. Alaska Retirement Management Board, 2015

The Alaska Retirement Management Board (ARMB) will invest in Farmland with the goals of portfolio diversification and attaining the optimum return on the portfolio. It recognises the need to use active, 3<sup>rd</sup> party investment management in order to obtain the highest attainable total investment return (measured as income plus appreciation). Over rolling 5 year periods, the Farmland investment portfolio is expected to generate a minimum total real rate of return (net of investment management fees) of 5% and an income return of at least 4%. The Farmland portfolio will be diversified as to crop type, property type and geographical location. Allocations will be made within a broad set of constraints, for example, Farmland investments will be allocated 80% to row crops and 20% to permanent crops.

### 4.2. Illinois State Board of Investment, 2015.

Farmland is included in the Real Assets allocation along with Infrastructure, Timber, Gold and Other Commodities. A portfolio allocation of 5% is made to these investments in aggregate. Farmland investments shall be diversified across geography, crop type (e.g., row crop vs. permanent crop), management style (e.g., lease vs. operate), and property size.

### 4.3. New Mexico Educational Retirement Board, 2016.

The New Mexico Educational Retirement Board natural resources portfolio includes an allocation to timberland and Farmland. It is expected to generate returns, net of all fees and expenses, (i) in excess of the National Council of Real Estate Investment Fiduciaries Index for Timberland (50%) and Farmland (50%) ("NCREIF Index") over rolling five year investment time horizons. Farmland includes but is not limited to row and field crop land, irrigated and non-irrigated, permanent plantings such as fruit and nut trees and vines, multi-year crops such as sugar cane and alfalfa. The preference is to allocate to higher than average yielding properties generally and those that have lower than average costs-of-production per unit. Target unleveraged gross-of-fee total returns for Farmland investments are 6% real.

Target investments may include funds and/or companies involved in the acquisition of water associated lands and water rights for leasing, and/or obtaining higher value through entitlement and diversion to higher and better use (HBU) for municipal, commercial, industrial, and residential purposes. Target gross of fee total returns for Water investments are 10% or greater.

The exposure to natural resources shall include investments diversified across various locations globally and in economies with different economic concentrations. Farmland may comprise up to 50% of the Natural Resources allocation, with between 30-80% in the Northern Hemisphere and 20-70% in the Southern Hemisphere.

### 4.4. Regents of the University of California, 2007.

An allocation to Farmland is made from the Real Assets portfolio with up to 30% allocated to Farmland. The benchmark for evaluating the Program's investment performance will be the National Council of Real Estate Investment Fiduciaries (NCREIF) Property Index for Farmland. The program is intended to include both permanent and row crops.

### 4.5. Municipal Employees Retirement System of Michigan, 2013.

Farmland is included in the Real Estate allocation along with infrastructure, energy and real estate.

The objective of the allocation to Real Assets is to achieve capital growth/appreciation, high real returns (providing a hedge against inflation), and diversification from other asset classes in the portfolio. Additionally, the portfolio is expected to generate current cash dividends given the yielding nature of the investments.

The Real Assets allocation is targeted to be 10 – 15% of the Total Portfolio, and contain five sub-asset classes: Private Real Estate; Commodities; Private Infrastructure; Timber; and Agriculture/Farmland.

Each sub-asset class is expected to constitute 2 - 5% of the overall portfolio. The neutral allocation amongst the sub-asset classes is equal weight, however, based on legacy portfolio composition, investment performance, and current market opportunities, the sub-asset allocation will be somewhat fungible.

#### **4.6. Pennsylvania Public School Employees' Retirement System, 2013.**

The investment objective of the program is to invest in high quality properties with permanent plantings producing commodities with broad consumer acceptance and that emphasise income over appreciation returns. The farmland portfolio will be expected to achieve a minimum, long-term six percent (6%) real (inflation-adjusted) net (after fee) rate of return. The target real rate of return is for the total portfolio of each Manager, and acceptable levels of return for any individual investment will be determined within the context of the role of that investment in enabling PSERS' farmland portfolio to meet its overall diversification objective; the anticipated components of overall return (income and appreciation), as related to the cropland type, geographic location, lease structure and quality of the income stream (as defined herein); and the degree of risk associated with the investment in terms of the foregoing composition categories.

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