



Australian Government

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Boundless Plain

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**South Australian Research and Development Institute
ADELAIDE**

Launching the future fleet

It's a great pleasure to come to Adelaide to talk about our future fleet.

Yes, it's got submarines – but the fleet *I'm* talking about has also got great universities.

It's got the world's most technologically sophisticated mines.

It's got globally competitive, locally invested manufacturing firms.

It's got great hospitals, attached to centres of excellence in medical research.

It's got all-electric cars, connected to a zero-emissions grid.

And when the sun doesn't shine, and the wind doesn't blow, it has battery reserves to power not just the cars, but the factories, the cities and the homes.

That's our future fleet: bold startups, big scale-ups, and broad potential.

So it goes without saying that it's got some phenomenal farms.

And if the students competing for the National Student Award today are anything to go by, those future farms are well in hand.

I had a sneak preview of their work last night. With these young people at the helm – and people like you to back them – I'd say the future is very bright indeed.

So let's talk about how we get to tomorrow – as a nation.

Beyond boundless...

Let me start the way that traditionalists do: with the national anthem. There's a word in that song that bothers me.

It's 'boundless' – as in 'boundless plains'.

Maybe the plains *looked* boundless in the early days, when we were going at them with nothing but shovels and sweat. But people with satellite data ought to know better.

A lawyer will tell you that the international community has a very definite sense of where Australia begins and ends.

An economist will tell you that something with no limits has no market value, so we wouldn't want it anyway.

And a scientist will tell you that there are hard limits to the acreage we can farm.

When I was President of ATSE, the Australian Academy of Technology and Engineering, I asked a panel of experts to tell me just how hard those limits are.ⁱ

They reported that the land and water resources available for cultivation in southern Australia are almost fully developed, with some opportunities for further irrigation in Tasmania.

Looking north, it's unlikely that new developments can add more than 5 per cent to the current cropped and irrigated lands.

It's all looking pretty bounded to me.

So when I was asked a few months back to contribute an opinion piece to an agricultural publication called "Boundless Plains"... I grit my teeth.

But then I thought about it.

And I thought about the agricultural production at the time in the late nineteenth century when the national anthem was written.

In 1895 a hectare planted with wheat returned half a tonne in yield.ⁱⁱ

Today it returns three times as much.ⁱⁱⁱ

The size of a 'hectare' didn't change. But its potential has massively expanded.

And of course, that's because we had the knowledge and ideas to improve the way we farm.

So I'll concede there *is* a boundless Australian plain – it's just not the one we probably think we're referring to.

It's the boundless plain of science – and the boundless capacity of Australians to make progress through innovation.

So I wrote my 600 words, and Australia kept its anthem – with an asterisk.

But note that we shouldn't set out in the belief that the opportunities of the future are simply there for any of us to *take*.

They are only there for us to *make*.

The next plain

So where's the next boundless plain of opportunity for Australian agriculture? I've got three in sight.

FIRST: Boost the yield.

A world with more people, with more middle-class appetites, will need more food. It's a simple point, frequently made, with staggering implications.

I think of China.

In 2015 China consumed some 57 million tonnes of pork^{iv} representing about half a billion pigs.^v Pork consumption has grown sevenfold since the late 1970s.

Beijing now keeps a strategic national pork reserve, because fluctuations in the price for pork are so potent they show up in the national inflation rate!^{vi}

And it's not just pork. Total meat consumption per person has quadrupled in China since the early 1970s.^{vii}

Total *dairy* imports more than quadrupled in the *five* years from 2008 to 2013! ^{viii}

And China still trails Western diets in terms of protein consumption!

Today, globally, food production is a 5 trillion dollar industry – that's 5 trillion US dollars – representing ten per cent of global consumer spending.^{ix}

Just imagine the size of the global stomach tomorrow, and the sense of urgency attached.

So can we scale up the Australian contribution? I am confident we can.

And I think back to wheat.

Half a tonne in yield per hectare in 1895. 1.6 tonnes today. A trebling in one hundred years.

Impressive – but can we treble it again? Yes, we can!

And not by prohibitively expensive technologies, but relatively simple changes already demonstrated in the field by the CSIRO.

Through a combination of better weed control, crop rotation with canola, bio-fumigation and April sowing, the CSIRO is hitting wheat yields in the order of 4.5 tonnes per hectare.

I'm not saying that we need to put more wheat onto the global market tomorrow.

Of course the market prices and the commercial imperatives are going to change, and the problem for growers today is *over* supply.

My point is that we can achieve more, with less, and more reliably.

By applying science, we're less hostage to climate: the natural one, the economic one and the political one! We're in control – and that's right where we want to be.

So that's the first boundless plain for us to harvest.

Here's Number TWO: Boost the dollar returns.

As we know, we can do that in two ways: lower the cost of the inputs or raise the price of the outputs.

On both fronts, we have enormous potential.

Take one input: nitrogen.

More than 100 million tonnes of nitrogen fertiliser are applied to the world's croplands each year. About 3.5 million tonnes is used in Australia.^x

But only about 40 million tonnes is actually taken up by the plants. 60 million tonnes is at best wasted – and at worst, ends up swilling around in waterways, feeding algae and consequently killing fish and harming people.

But what if we could use sensor technology to direct the nutrient to the plants with pinpoint precision? What if we could deliver that nutrient through a self-directing sprayer, using satellite guidance to travel with maximum efficiency and minimal fuel?

What if we combined the sensors and robots with a detailed soil map and a better understanding of plant genetics?

What if we could use advanced analytics to think across *all* of these complicated datasets?

We would be using one input – science – to reduce all the other inputs we'd rather not have.

And we would *also* be raising the market price for our produce at the same time – by reinforcing our reputation for farming clean and green.

But that's not the only option we have for raising the price.

- We can lift the excellence of the produce.
- We can target the niche markets for luxury crops.
- We can give consumers in nervous markets the certainty on quality and safety that they crave.

I think of a father buying baby formula in Shanghai.

If he's anything like me, he wants to know the provenance of the product in his hand.

He would pay a premium if he could enter the lot code into his smart phone and track the milk in that baby formula back to the farm – even perhaps to the individual cows!

And all across Australia, I see farmers working with governments, universities and investors to create opportunities like these.

Which brings me to the THIRD boundless plain of opportunity: selling what we know, as well as what we grow.

Today Australian farms contribute about one per cent of the world's food and fibre output. It's a critical one per cent, no question. But it still leaves ninety-nine per cent of the output grown somewhere else.

So why not share in that ninety-nine per cent?

Ladies and gentlemen, the world wants to farm smarter. It has to farm smarter! And so it *will* farm smarter, with the push from determined governments, and the pull from hungry markets.

In 2014, the global venture capital investment in agricultural technologies topped US\$2.3 billion.^{xi}

In 2015, venture capital for agriculture doubled – to \$4.6 billion.

Total venture capital across all sectors combined grew by 44 per cent – but agtech venture capital grew more than twice as fast!

Where did that money go?

Some of it went to the technology developers – but you don't have to stand at the cutting edge of research to turn a quid.

The lion's share of the opportunity comes from making great ideas and good advice available at scale – customised to every farm, but cost-competitive for every farmer.

And when have farmers needed that assistance more than they do today?

It's not just the panoply of new technologies on the table – as complicated as they are.

- It's the reality of a changing climate.
- It's a fast-changing and increasingly fussy market.

- It's the webs of regulation that governments weave around the food supply chain.
- It's managing all of those pressures, whilst balancing the books, paying the workers and praying for rain.

Who does it harder than farmers in this country?

And who's learned to do it better than we have, in Australia?

We've cracked the challenge of farming in six different climatic zones, from temperate to equatorial to desert.

So why not profit from that expertise and win investment at the same time in local research, local skills and local firms?

From METS and BETS to FETS...

We know we can build new globally competitive service industries around existing sectors of strength.

The archetype is mining.

Whilst we were exporting the ore we were investing in R&D at the same time. Our mine sites are the testbeds for technology, and our companies operate all over the world.

And so our reputation spread.

Today the Mining Equipment and Technology Services sector is sufficiently well respected that we refer to it by its acronym, METS.

We built it on the back of our mining boom. It contributes \$10 billion every year to the economy, with exports of at least \$3 billion, and over 31,000 jobs.^{xii}

If we can build a METS, we can have a FETS – that's 'F' for farming.

What else do we do well in this country?

Bear with me for a moment: it's banks.

For a long time, the banks have been some of our biggest investors in research and development, particularly in ICT.

That investment built our research capability and skills. And on that foundation we have built a thriving financial technology sector, with every prospect of growing further in the decade ahead.

Of the world's Top 100 Financial Technology companies, 9 are Australian: Australian built and Australian based.

To keep competing, the banks have to keep investing in R&D. When they invest in R&D, they create the conditions for more FinTech competitors to grow.

It's the best of all cycles for the industry, the country and the consumer!

METS, FETS and now BETS. – that's B for banking.

Conclusion

My concluding remark is to think big.

If you think big then the boundless plains for agriculture don't have to end at our beaches.

They're as big as the planet.

Now is the time to be seizing the opportunities already well within our grasp.

Agricultural is a flagship of our future fleet.

So let's sail into the future *like we mean it*.

THANK YOU.

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- ⁱ ATSE, *Food and Fibre: Australia's Opportunities*, 2014.
<http://www.atse.org.au/atse/content/publications/reports/agriculture/food-and-fibre-australias-opportunities.aspx>.
- ⁱⁱ *Year Book Australia, 2000* (ABS)
<http://www.abs.gov.au/ausstats/abs@.nsf/94713ad445ff1425ca25682000192af2/3852d05cd2263db5ca2569de0026c588!OpenDocument>.
- ⁱⁱⁱ *Agricultural Commodities, Australia, 2001-11* (ABS).
- ^{iv} <http://www.ft.com/intl/cms/s/0/8777ec96-11cf-11e6-91da-096d89bd2173.html>.
- ^v <http://www.mla.com.au/Prices-markets/Market-news/Pork-China%E2%80%99s-most-popular-protein>
- ^{vi} <https://www.washingtonpost.com/news/worldviews/wp/2016/05/05/why-china-keeps-a-giant-stockpile-of-frozen-pork/>
- ^{vii} <http://www.globalmeatnews.com/Industry-Markets/China-meat-consumption-quadruples-since-early-1970s>.
- ^{viii} <http://www.ers.usda.gov/media/1784488/eib136.pdf>.
- ^{ix} McKinsey, *Global agriculture's many opportunities*, 2015.
<http://www.mckinsey.com/industries/private-equity-and-principal-investors/our-insights/global-agricultures-many-opportunities>.
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<http://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/4627.0Main%20Features72014-15?opendocument&tabname=Summary&prodno=4627.0&issue=2014-15&num=&view=>.
- ^{xi} Agfunder, *AgTech Investing Report: Year in Review 2015*, 16 February 2016.
<https://research01.agfunder.com/2015/AgFunder-AgTech-Investing-Report-2015.pdf>.
- ^{xii} AusTrade, "Mining Equipment, Technology and Services Sector".
<http://www.austrade.gov.au/australian/export/export-markets/industries/mining-equipment-technology-services>.