global megatrends – challenges and opportunities for cotton producers

78th International Cotton Advisory Committee Plenary Meeting
Global Leadership: Pushing Cotton’s Boundaries

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Global cotton outlook and market conditions

Cotton trade is highly concentrated ...

Volume of raw cotton exports, average three years 2016-17 to 2018-19

Source: USDA, Australian Bureau of Statistics (ABS)
Global cotton outlook and market conditions

Cotton production is shaped by government policies and support

Estimated assistance provided by governments to the cotton sector
(not including credit assistance)

Source: International Cotton Advisory Committee 2019, chart excludes countries with less than 20kt production (Senegal and Columbia)

*producer assistance is often worth 20% or more of global prices*
Global cotton outlook and market conditions

Cotton prices have returned to around 2014-15 levels

Ratio of cotton price to wool improving but polyester is becoming more competitive

Notes: September 2014 = 1.00. 21 micron average price (Wool), Acrylic Staple (North Asian acrylic staple fibre, 1.5 denier) and Polyester Staple (China polyester staple fibre, 1.4 denier, 38mm). Source: Calculated from Australian Wool Exchange, Cotton Outlook, Fibre2Fashion
Global cotton outlook and market conditions
ABARES projects global prices fall 9% and then recover

ABARES cotton prices and projections, 2011-2023
Notes: a Australian cotton price derived from average Gross Value of Production for each 500lb bale.
f ABARES forecast. z ABARES projection. Source: ABARES
Australian cotton production and regions

10 year averages to 2018-19

Source: Cotton Australia, ABARES
Australian cotton production

Production volumes vary with water availability – which is highly variable

Australian cotton production, 2009-10 to 2019-20
Source: Cotton Australia, ABARES
Megatrends shaping agriculture, and cotton’s operating environment

- GROWTH JUGGERNAUT
- EMPOWERED CONSUMERS
- DISRUPTIVE TECHNOLOGIES
- MORE FROM LESS
- FRACIAL GEOPOLITICS
- CASCADING PLANETARY RISKS
- TOUGH CHOICES

GROWTH JUGGERNAUT
and three billion EMPOWERED CONSUMERS

Rapid growth in emerging economies, particularly in Asia, will lift incomes, capability and expectations.

An expanded and empowered middle class will demand higher volumes and quality of food and fibre, including more diverse diets and more protein – with rising expectations for health, provenance, sustainability, and ethics.
Increasing income outweighs population growth
An expanded and empowered middle class will demand higher quality food and fibre

Asia re-emerges, driving a three-fold increase in people in high income nations by 2050
Distribution of real global GDP per capita by countries and regions, 2015 and 2050

Notes: High income threshold US $12,000 GDP per capita (World Bank (2014); a Includes Asian nations Japan and South Korea, and non OECD countries Bulgaria, Croatia, Lithuania and Romania; b Emerging and developing Asia; c Brazil, Russia and South Africa. Source: Data from Hatfield-Dodds, Schandl et al. 2017
Empowered consumers will shape markets
Attitudes are complex and will continue to evolve

Dominant concerns today

... mapped to GDP in 2050

Source: Edelman Trust Barometer 2015

Source: Dominant concerns from Edelman (2015) applied to projected GDP in 2050 from Hatfield-Dodds, Schandl et al. (2015)
MORE FROM LESS
The permanent race for advantage

Relentless innovation drives improved productivity, and more efficient use of materials, energy, water, land and labour.

Maintaining profitable and competitive food and fibre enterprises will require constant change.

MORE FROM LESS
Maintaining profitable and competitive food and fibre enterprises will require constant change

Australian productivity growth is keeping pace with advanced economies, but emerging producers are catching up

Change in productivity from base year, selected countries
Notes: Index of total factor productivity at constant real prices. Average of 1962 to 1967 = 100.
Source: US Department of Agriculture Economic Research Service 2017
DISRUPTIVE TECHNOLOGIES
Opportunities for the brave

Exponential advances in digital technology, automation, genetics, and synthetics will disrupt and change how food and fibre products are made, marketed, and delivered.

Production systems, supply chains, and customer engagement will become more agile and interconnected, requiring new skills and partnerships, and creating risks and opportunities for agricultural producers and regional communities.
Disruptive Technologies
Offer new ways to engage suppliers and customers, creating new markets, opportunities, and risks.

- Effective outcomes require new actions by diverse players.
- Current roles and actions work well.
- Systems and values well understood.
- Contested values, and complex systems.

FRACTAL GEOPOLITICS

Beware the dance of global giants

Deep shifts in economic, military and cultural power continue to reshape the world, as the rise of multiple global powers erodes previous certainties, notwithstanding increasing global integration.

International trade and relations will become more complex as nations assert their sovereignty, often in pursuit of populist national approval rather than mutual economic gains.
Great expectations ... will also impact on policy
Producer support is trending up in key emerging markets

Nominal Producer Support estimate ratio, selected countries
Notes: PSE is calculated as the difference between the value of gross farm receipts at the farm gate relative to farm output valued at border prices. Percentages at right indicate change from 1996 to 2016. Source: OECD 2018
CASCADING PLANETARY RISKS

Coming ready or not

Accelerating changes in climate and environmental systems are creating multiple risks – and some opportunities.

Agriculture is already impacted, and adapting.

Climate and commodity prices will become more volatile, while emerging markets for carbon and ecosystem services could transform landscapes and business models.
Global surface temperature anomalies of the Earth (land and ocean) for 1950–2015. Anomalies are with respect to the 1961–1990 base period. Major tropical volcanic eruptions are associated with cooler global temperatures. El Niño and La Niña events typically develop in winter to spring and decline the following autumn. For strong events, the response in global temperature is greatest in the latter part of an event and thus the year following the start of the event is highlighted. For example, the warming associated with the 1997–98 El Niño led to high mean global temperatures in 1998 (the warmest year for the 20th century). Neutral years are those years with no moderate or strong El Niño or La Niña events occurring. Data from World Meteorological Organization. Source: http://www.bom.gov.au/state-of-the-climate/

CASCADING PLANETARY RISKS

Accelerating changes in climate and environmental systems are creating multiple risks – and some opportunities

Climate effect on farm cash income, 2000-2019 relative to 1950-2019

Source: ABARES
CASCADING PLANETARY RISKS
Accelerating changes in climate and environmental systems are creating multiple risks – and some opportunities

climate change and increased variability makes productivity growth more challenging and amplifies producer risks

Climate adjusted and total factor productivity for Australian cropping farms
Note: Index of cumulative change in output value from base period, calculated as average for 1977 to 1982 = 100. Source: ABARES
CASCADING PLANETARY RISKS + EMPOWERED CONSUMERS = CHALLENGES
CASCADING PLANETARY RISKS + EMPOWERED CONSUMERS = CHALLENGES

Cotton represents nearly half the fibre used to make clothes and other textiles worldwide. (…)

Our use of cotton comes at huge and unnecessary cost: growing cotton unsustainably, with massive inputs of water and pesticides, has already been responsible for the destruction of large-scale ecosystems such as the Aral Sea in central Asia and the deteriorating health and livelihoods of people living there.

WWF (2013) *Thirsty crops* report

cotton accounts for
2.4% of arable land
24% of the global insecticides
11% of pesticides

Image: Aral Sea, 2014
Rising expectations for sustainability, fair trade and ethics

- income for smaller holder farmers
- pesticides, fertiliser and chemicals
- water use and scarcity
- labour and workforce conditions
- traceability and accreditation

... including supply chain issues where cotton producers may have little direct control
Rising expectations ...

*Industry reputation is a common property resource*

Fire crews respond to BP’s Deepwater Horizon fire and oil spill, 2010

Image: Shutterstock 2018
TOUGH CHOICES

Will nations choose to surf or sink?

Evidence based policy making appears more difficult and less common, as internet echo chambers become more influential.

This complicates the already challenging task of building consensus for worthwhile policy action, as most reforms involve short term pain for long term gains – which is rarely popular.

Yet evidence and analysis will remain crucial to addressing emerging challenges. Reform is most likely when analysis and arguments connect strongly to the hopes, fears and values of everyday people.
Tough choices (and big opportunities)

Good policy can deliver good outcomes for producers and consumers

Value of Australian farm production
(real 2016-17 dollars) Source: ABARES, ABS
Tough choices (and big opportunities)
Everything contributes to relative performance

- **INSTITUTIONS AND CULTURE**
- **PHYSICAL INFRASTRUCTURE**
- **ON FARM PRODUCTIVITY**
Tough choices (and big opportunities) ...

but change is rarely easy

Farm business profit by farm size, Australian sugarcane
(Sugarcane farms 2013-14) Source: ABARES, ABS
Increasing resource scarcity
... makes it crucial to support efficient resource allocation

Historical water use in southern Murray-Darling Basin
Water use by irrigation activity
Source: ABARES; Australian Bureau of Statistics

Modelled underlying water demand by use
Southern MDB. Assumes allocation price of $100MI (real).
Source: ABARES
Increasing resource scarcity
... will create new sources of competitive advantage

Increased value of living resources could create win-win economic and environmental outcomes, with integrated policy settings
Megatrends
shaping agriculture, and cotton’s operating environment

Draws on CSIRO Megatrends
Hajkowicz (2015) and Hajkowicz and Eady (2015)
MEGATRENDS and key implications for Australian agriculture and Basin communities

GROWTH JUGGERNAUT: Three billion empowered consumers
Rapid growth in emerging economies, particularly in Asia, will lift incomes, capability and expectations. An expanded and empowered middle class will demand higher volumes and quality of food and fibre, more diverse diets, and more protein – with rising expectations for health, provenance, sustainability, and ethics.

FRAC TAL GEOPOLITICS: Beware the dance of global giants
Deep shifts in economic, military and cultural power continue to reshape the world, as the rise of multiple global powers erodes previous certainties, notwithstanding increasing global integration. International trade and relations will become more complex as nations assert their sovereignty, often in pursuit of populist national approval rather than mutual economic gains.

CASCADING PLANETARY RISKS: Coming ready or not
Accelerating changes in climate and environmental systems are creating multiple risks – and some opportunities. Agriculture is already impacted, and adapting. Climate and commodity prices will become more volatile, while emerging markets for carbon and ecosystem services could transform landscapes and business models.

MORE FROM LESS: The permanent race for advantage
Relentless innovation drives improved productivity, and more efficient use of materials, energy, water, land and labour. Maintaining profitable and competitive food and fibre enterprises will require constant change. Population continues to drift from smaller towns to larger regional centres and capital cities.

THE LUCKY COUNTRY: Will we choose to surf or sink?
Australia is indeed lucky: a ‘lifestyle superpower’ with competitive industries, vibrant communities, and unique landscapes and environmental assets. But unearned advantage risks complacency, and each generation needs to create the luck – and advantages – we will pass on to the next generation.

DISRUPTIVE TECHNOLOGIES: Opportunities for the brave
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Adapted by Hatfield-Dodds from Hajkowicz (2015) and Hajkowicz and Eady (2015) by Hatfield-Dodds (2019)