TICKETS PLEASE!
TRAIN LEAVES IN 30MIN...

IFMA 22
3RD - 8TH MARCH 2019, LAUNCESTON, TASMANIA

JESSE READER - AG. SECTOR SPECIALIST
AGENDA

- Bosch Overview
- Industry overview
- Micro Climate Sensing
- Robotics
- Image Analytics
- Connectivity
- Summary

You have a very exciting (read: unpredictable) future
“If I had asked people what they wanted, they would have said faster horses...”

~ Henry Ford

DISRUPT or BE DISRUPTED?
BOSCH GROUP
FOUR BUSINESS SECTORS

Mobility Solutions
Industrial Technology
Energy and Building Tech.
Consumer Goods

133 Years making and selling “things”
$123 Billion in sales (AUD)
Rank 76 Global Fortune 500
410,000 employees (incl. 69,500 in R&D)
288 manufacturing sites
Private 92% owned by a charitable trust
BOSCH AND AGRICULTURE
ALREADY A €1Bio pa BUSINESS

EMERGING SMART AGRI BUSINESS

Japan  Spain  Australia  Brazil  France  Germany
BOSCH AUSTRALIA AND CONNECTED AGRICULTURE

Food Value Chain Focus – Solving real problems

No one can do it alone – the value of collaboration and partnerships
Merck bolsters animal health unit with $2.4 billion Antelliq purchase

Jeff Bezos and other investors raise $200 million for vertical farming startup Plenty

Farmers Business Network Raises $110 Million To Help Squeezed Cut Costs, Increase Farmers Profits

Indigo Ag raises $250 million at $3.5 billion valuation

Ginkgo Bioworks secures $275 million in Series D, valuing the company at over $1 billion

BREAKING: French Insect Farming Startup Ynsect Raises $125m Series C Breaking European Agtech Record
MICROCLIMATE SENSING
BSOCH CONNECTED AG: The Yield
Sensing+™ - End to end solution for Agri / Aqua-culture

What makes The Yield different.

Ecosystem approach for food value chain

Platform solution from sensing to recommendations for all key decisions (planting, irrigating, feeding, protecting/spraying, harvesting)

Intelligent, flexible and scalable. Any crop, any location, sensing up to 12 variables, unlimited measurement points, high accuracy AI predictions

Integrated compliance and record keeping, secure data market (with consent)

Revenue streams:
Sensing+, annual support, custom solutions, mobile apps, third party solutions (e.g. regulator) and eco-system access

Sense

Analyse & Predict

Inform & Record

7 Day forecast, up to 90% accurate, 24/7, 365 day digital record, M2M learning

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Farm Management – Enterprise Grade Technology

- Holistic, interconnected, predictive farming systems
- Scalable, cost effective and SMART connectivity
- Reducing risk and increasing precision with new insight
Micro Climate Sensing
Becoming crowded...
Micro Climate Sensing

THE AGRONOMIST

- Your ability to make informed decisions, increasingly requires you to absorb more information to reduce risk in the field for your clients and your employer
- So much of your job is underpinned by the need to be a combination of meteorologist, clairvoyant and agronomic expert
- Hyper local micro climate sensing and prediction will disrupt the way you operate and inform
DULL. DIRTY. DANGEROUS.
Robo shock: the jobs automation will pinch

Adam Gartrell

From the factory floor to the supermarket, the call centre to the video store, it has happened to the working class already as waves of technological change that have rendered many of their jobs obsolete.

But the next advances in automation won’t just affect the low skilled and low paid. In the years ahead many middle-class professionals, engineers, accountants, journalists and insurance workers to name just a few – will find themselves replaced by computers, robots and artificial intelligence.

Technological change can be liberating but it also breeds anxiety. And if it’s not managed properly it could also worsen inequality by further skewing the power balance in the workplace and across society.

This is the central message of an upcoming book by federal Labor frontbencher Jim Chalmers and former NAB boss Mike Quigley: there is no such thing as “technological trickle-down.”

Without the right response, the economic gains achieved through increased productivity won’t be shared.

“Some jobs will be lost, some will be created, some will be augmented but all of them will change. Our points is we should care how that change is distributed across our society,” says Dr Chalmers.

A report by the University of Oxford last year found 17 per cent of jobs across the OECD were at risk of automation. Some of the world’s finest thinkers – including acclaimed physicist Stephen Hawking – have warned this will lead to significant political and societal upheaval.

As yet, the job cuts have been limited by the fact that there are so many jobs to go around. But both are worried about how Australia will cope with the changes ahead. They reject the “let it rip” crowd who cheer on technological change with no regard for the wealth distribution or the transitional impact on real people. They put Prime Minister Malcolm Turnbull in this camp.

Equally, they reject those “embodied by populist politicians like Donald Trump out here at home, Pauline Hanson – who think it is possible to resist technological change or even turn the clock back to simpler times. Rather, the authors argue we should embrace technology but ensure growth is inclusive, work is rewarded and there is a strong new social safety net to catch those left behind. That involves intervening to correct market failures, increasing investment in education and lifelong learning, and rethinking industrial relations.

Strong leadership will be essential in tackling the crisis, and Mr Quigley argues that right now Australia is horribly ill-prepared for the changes to come. Schools, universities, workplaces, governments and, above all, individuals, need to start changing now.

The authors themselves are an “odd couple” – Quigley is a technologist and Baby Boomer businessman from Sydney; Chalmers a Gen X economics boffin and rising star of the parliament from Logan. © Robert Bosch (Australia) Pty. Ltd. 2017. All rights reserved, also regarding any disposal, exploitation, reproduction, editing, distribution, as well as in the event of applications for industrial property rights.
What role will robotics play in the future?
Start-Up Landscape

It’s starting to get busy … but beware of the hype!
BOSCH CONNECTED AG
Robotics & Automation – Are we ready?

Agronomic Risk
Integration
Social Acceptance
Business Model
R&D
The Opportunity

- The growth stage (GS) of a plant underpins almost every significant in-field activity from weed management to harvest
- In farming, the difference between ‘the best’ and ‘the rest’ is timeliness of execution
- One of agriculture’s fundamental building blocks is matching an immediate need with an appropriate action
- If you could predict crop GS and some of its associated behaviours you could have a dramatic impact on the success of the crop and the sustainability of the enterprise
Industry Engagement
Foliage Image using RGB and NDVI mapping. NDVI can be used to assess Chlorophyll content in green vegetation.

Grass field image shows different regions of yellow and green grass. Red=Green grass.

A depth image of the same field enables measurement of the grass height.
Image Analytics for Agriculture
Potential applications – But the sky is the limit...

- Tree canopy density / volume
- Species ratio in pasture
- % Chlorophyll in turf
- Leaf Area Index

- Growth stage prediction
- Colour prediction
- Size prediction
- Sugar Content

- Fruit / produce counting
- Yield prediction insight
- Emergence/germination rate
- Disease identification

- % weed coverage
- Shoot growth rate
- Plant health insight
- Nutritional insight
AgChem – Customer application

New Value Creation

SOCIAL. LICENSE. TO. OPERATE

Herbicide Stewardship
Protecting Crops Environment Technology

VegetationManager
DIURON 80 DF SPECIMEN LABEL

$60 billion U.S.

AgChem

$60 billion U.S.
The Internet of Things is a Hot and Beautiful Mess Until It Becomes the Internet of Everything

By 2020, the number of devices connected to the Internet is expected to exceed 40 billion.
CONNECTIVITY

- It is widely accepted and seen as one of the biggest enablers of AgTech in Australia and yet one of the biggest weaknesses
- There are options though...

  - LoRA
  - 6-LoPAN
  - NBloT
  - BTLE
  - Satellite
  - SigFox
  - CATM1
SUMMARY
FUTURE CROP MANAGEMENT & AGRONOMY

- Crop imagery and artificial intelligence will derive a new paradigm in plant management & agronomy
- Dynamic Automation will execute on big data gathered on farm from many sensing points
- Treatment will occur at the row level not the field level
- No more guessing. No more risky bets. Every action accounted for. Data driven decision making.

?
Given your expertise and position in one of the world’s most efficient Ag-markets, there is no better place to drive a technology-led agricultural technology boom than here in Australia...

THANK YOU