eShepherd™ automated grazing control for cattle

eShepherd

The world's first virtual shepherd

Transforming Livestock Farming Globally

- For productive, profitable and sustainable agriculture
- A world first, internet of things, smart farm system
- A significant technology export opportunity
- International beef and dairy markets
- CSIRO science and Australian engineering innovation
- Rural R&D for Profit Program Partner
- Widespread industry and international demand

The Global Farm Challenge

Increase profitable production to meet rising protein demand while managing:

- Rising input costs
- Rising labour cost and scarcity
- Increasing scale while keeping cost low
- Sustainability and welfare demands; and
- Maximising per hectare return

Fence, move and monitor using phone or tablet

Fully automated grazing control

eShepherd

1 Smartphone/Tablet App

2 Cloud Database

3 Base Station

GPS

Moveable virtual fence

4 Collar + Patented automated training algorithm

CSIRO

Automated fenceless grazing control

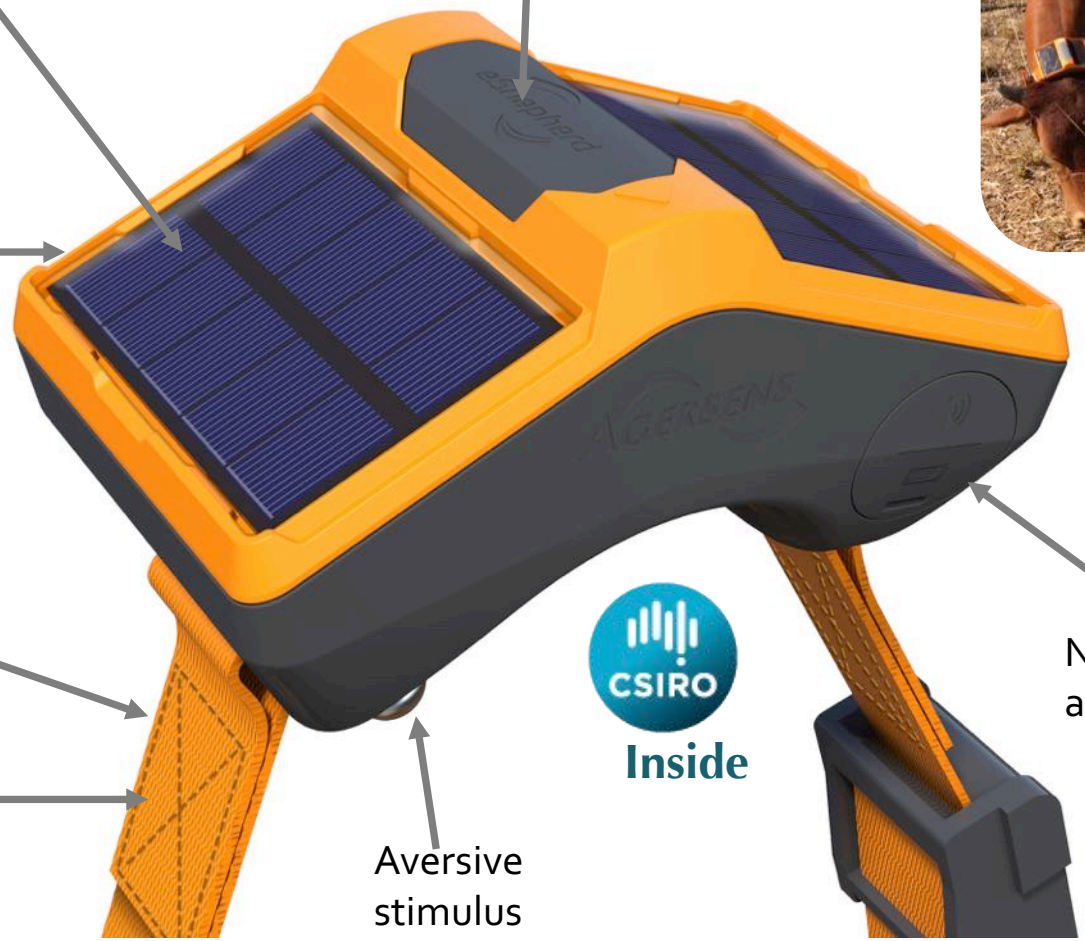
Collar

Robust and reliable collar with CSIRO patented training algorithm

Solar energy harvesting – no battery changes required

GPS location – no need for mobile phone network
LoRa comms to Base Station

Rugged and robust casing – 5 -10 year life



Adjustable strap

Counterweight maintains collar in position

Aversive stimulus

Non aversive audio cue

Base Station

- 2-way comms with collar
- Internet connected
- Solar or mains powered
- 30km range*

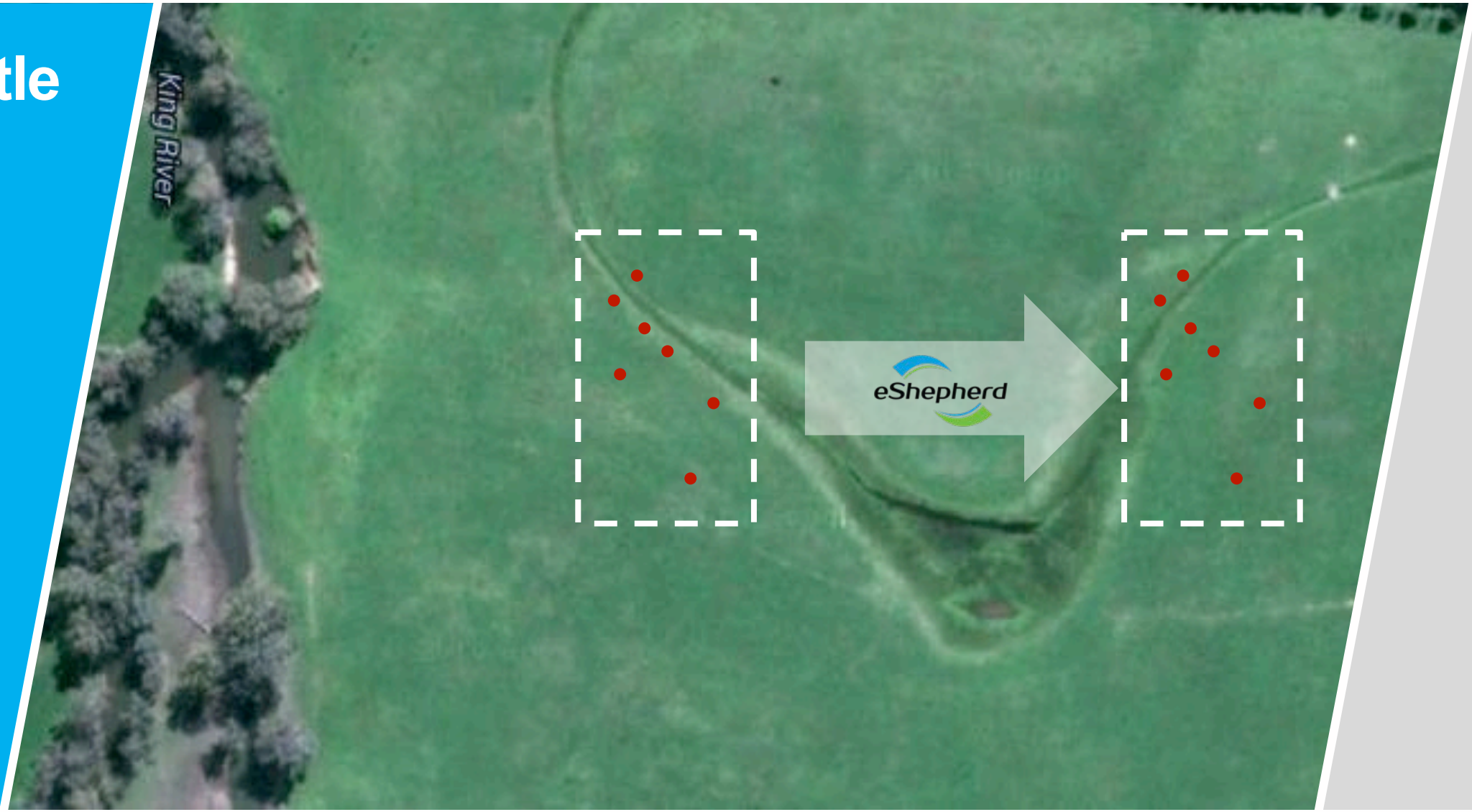
*On open rangeland

Automated Training Program by CSIRO

Associative learning trains each animal individually to respond to an audio cue alone

Move cattle from one grazing area to another

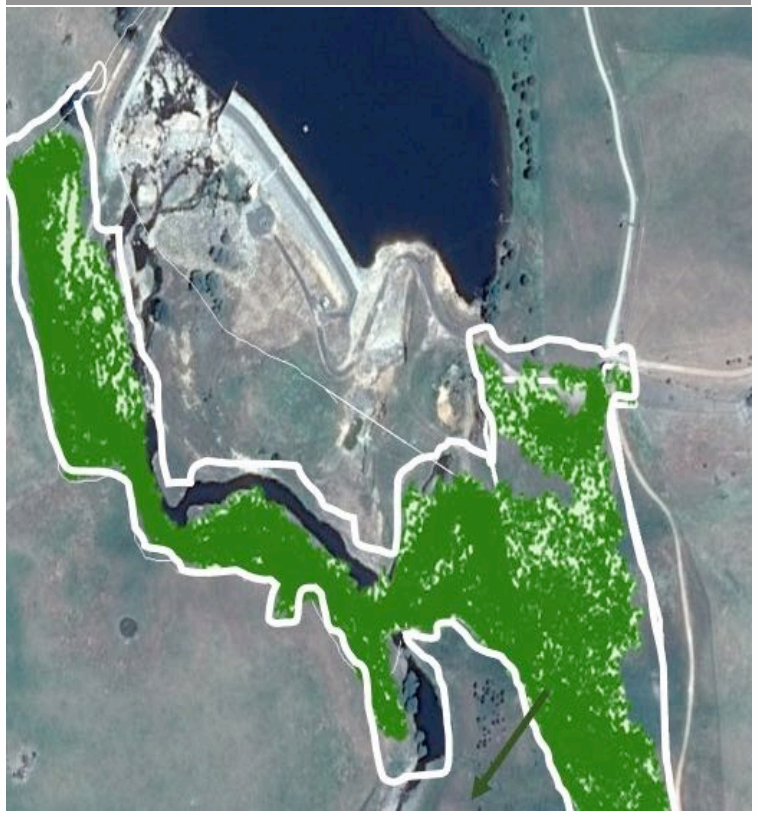
Mob grazing or individual animal control



Virtual Fencing on working beef property

"Virtual Fencing has the potential to make livestock handling simpler, cheaper and more efficient through so many ways"
John Guest, Farmer

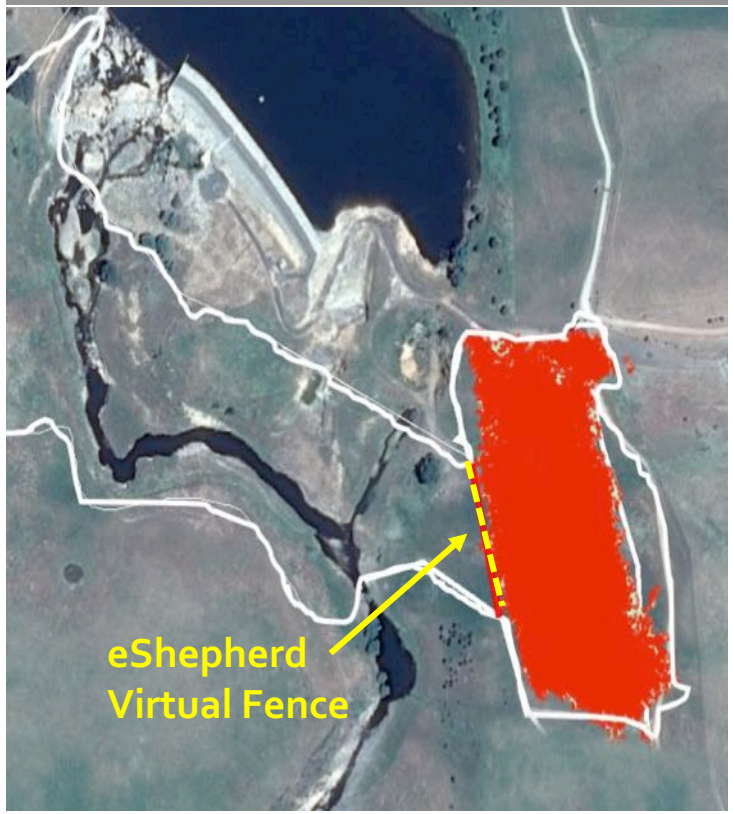
Grazing Before Fence



Cattle grazing in riparian zone

Cattle prefer to spend time in the riparian zone where the pasture is fresh and more lush.

eShepherd Riparian Fence



Riparian Zone Protected

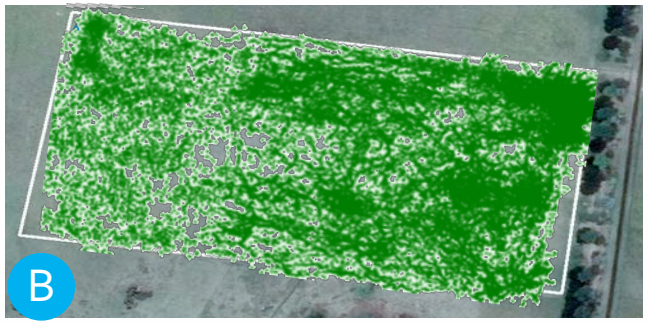
Applying the eShepherd virtual fence - cattle are now effectively prevented from entering the riparian zone.

Break feed grazing

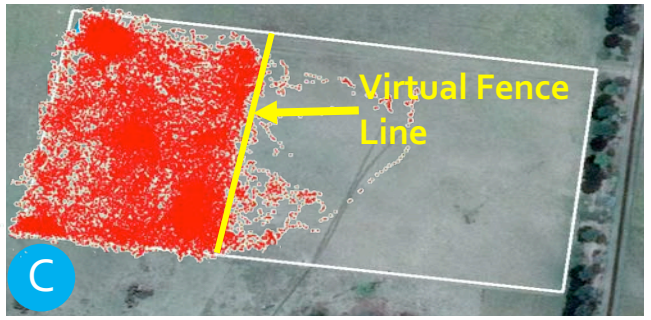
Angus cattle
CSIRO, NSW
March 2017

3 days each graze

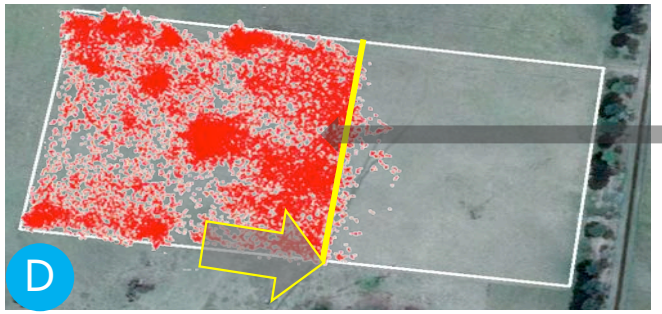
Paddock Setup



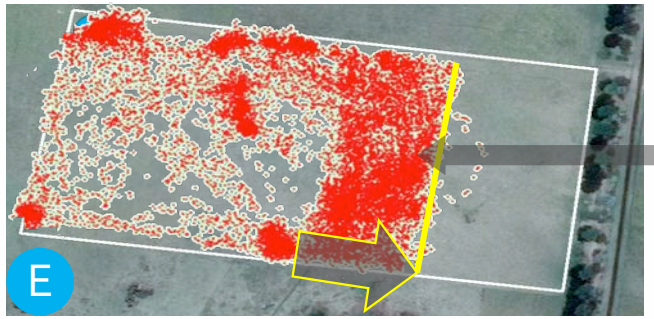
Cattle Free Grazing Pattern



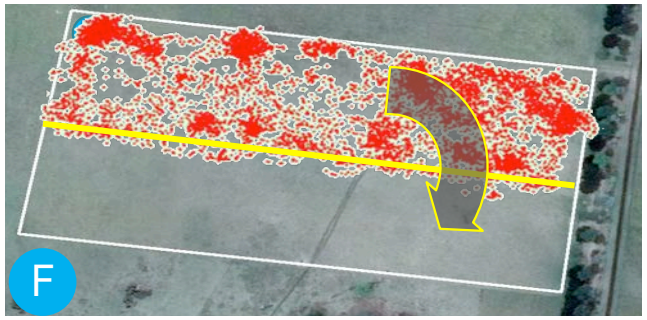
Grazing Pattern in 40% of Paddock



Fenced moved forward 70 m



Fenced at forward 70 m

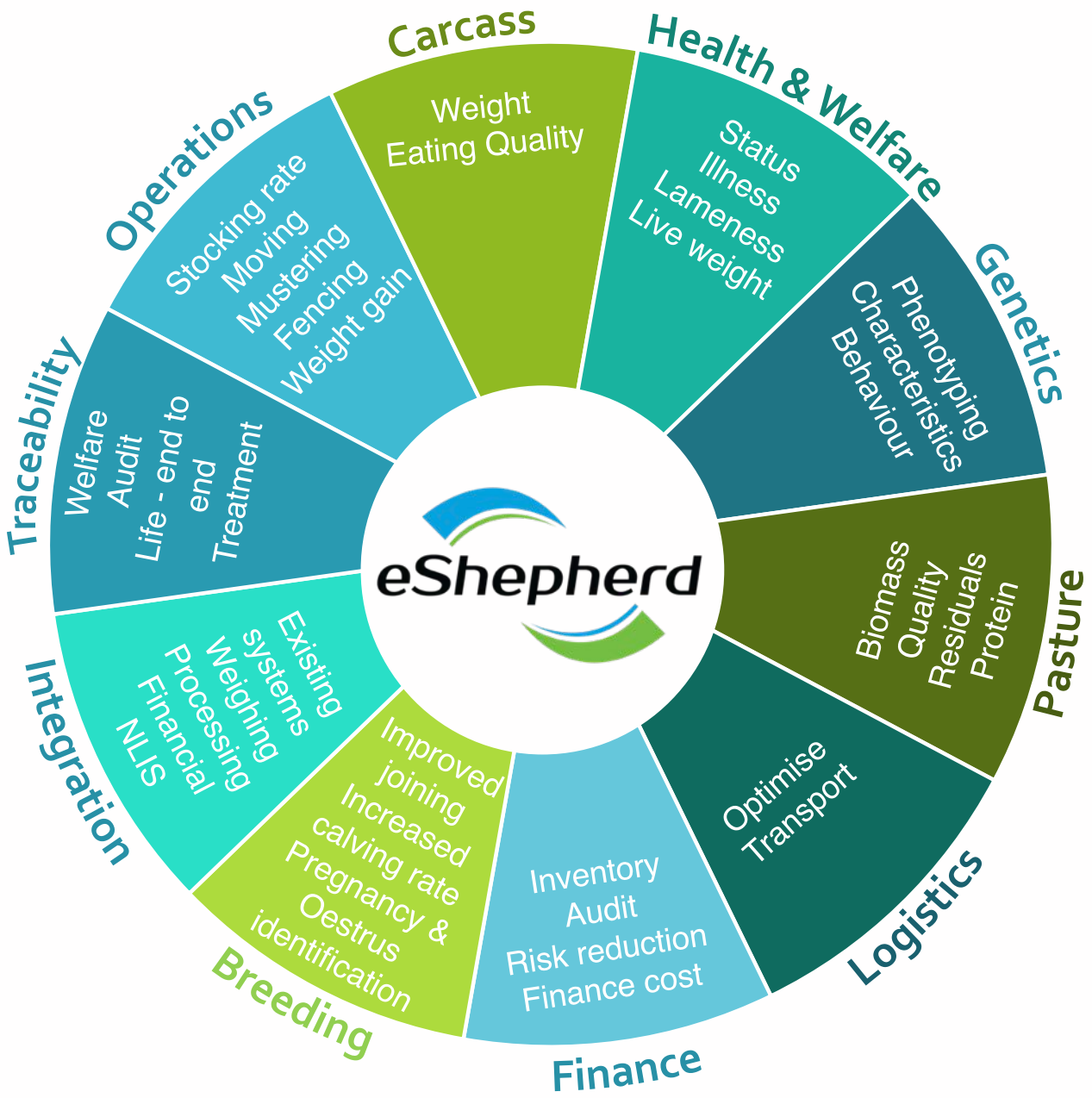


Rotate Fence 90°

Cattle graze in new pasture allocation

Digital value chain transformation

Automated animal movement unlocks value of data

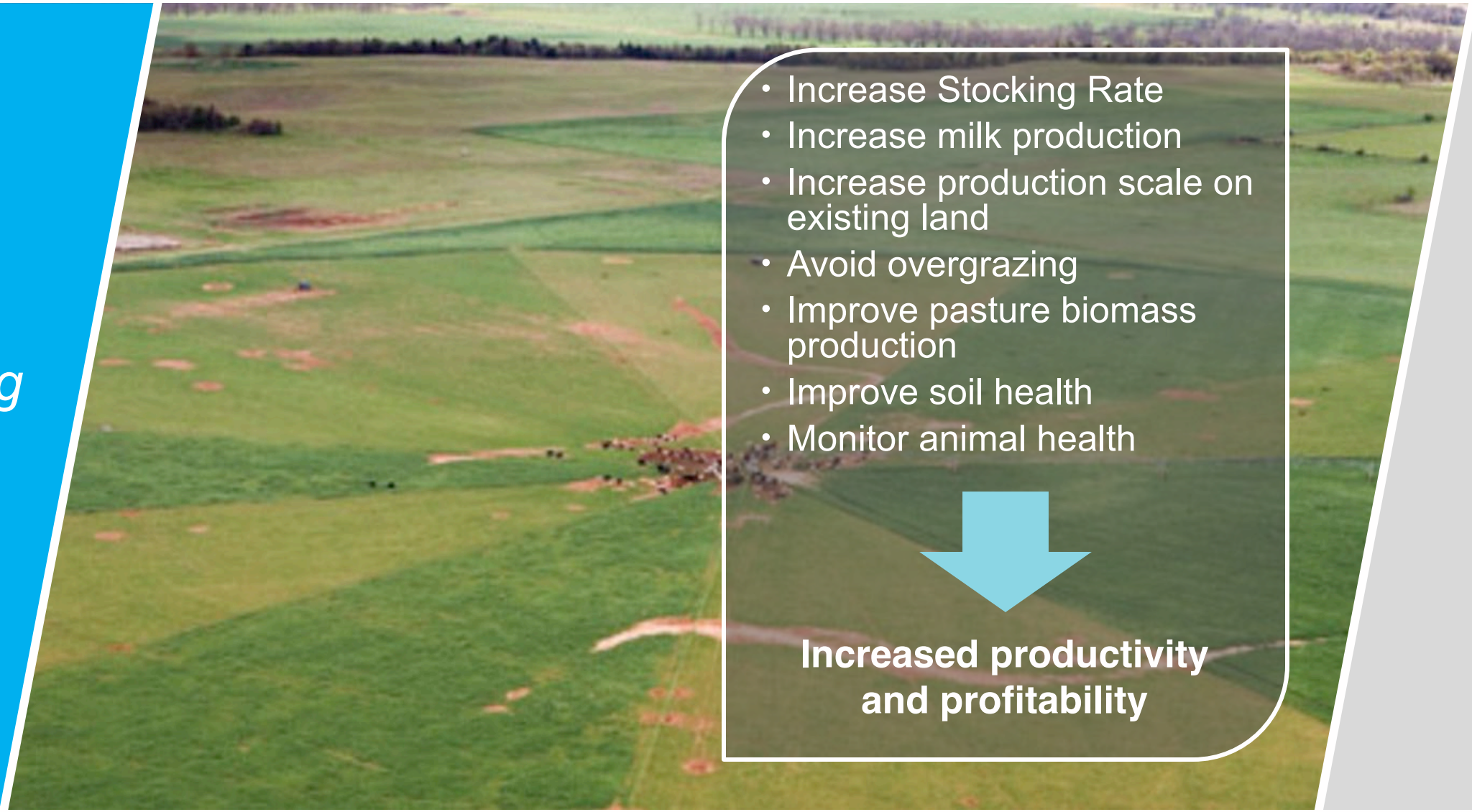


Farmer → Transport → Processor → Retailer → Consumer

Farmer and Value Chain Decision Support

Benefits

Automate Rotational/ Cell Grazing



- Increase Stocking Rate
- Increase milk production
- Increase production scale on existing land
- Avoid overgrazing
- Improve pasture biomass production
- Improve soil health
- Monitor animal health

Increased productivity and profitability

Benefits

Lower Cost Flexible Fencing

- Unlimited fencing!
- Moved with smartphone touch
- Lower labour and maintenance effort
- Flood and fire proof
- Fully flexible, curved boundaries

Lower cost and better quality of life

Benefits

Transform Mustering

- Reduce labour
- Muster all stock inventory
- Reduce cost of aircraft, Reduce accidents and insurance cost
- Reduce animal injury and stress
- Avoid stock weight loss
- Match transport needs to stock quantity

Lower cost and increased profit

Benefits

Sustainability

- Keep cattle out of rivers and sensitive environments
- Avoid overgrazing and land damage
- Wildlife friendly
- Improve water quality and availability
- Avoid ecological damage eg run off to Barrier Reef

Improved sustainability and reduced environmental footprint

Dairy value proposition

Increase milk production

Productivity Increase
$126 (year/cow)

- Increase Milk production by 1L/cow/day
- Better pasture utilisation
- Improved animal health
- 24/7 monitoring
- Data

Reduce Cost
$179 (year/cow)

- Labour
- Fertiliser
- Fence installation and maintenance
- Health costs

Less than one year payback*

*Dairy Australia modeling application on top 25% Gippsland farm
Ref: *1141 A1 Summary of Virtual Fencing Benefits DairyBase Modelling*

Beef value proposition

Increased Productivity

- Cell grazing to increase carrying capacity 50 - 100%
- Avoid land damage
- 100% stock mustering
- Reduce injury
- Increase health
- 24/7 monitoring

Reduced Costs

- Fencing
- Aircraft & ground crew
- Labour
- Insurance
- Animal health support

Less than one year payback*

** Return based on 20% increase in carrying capacity on farm, $100/head cost, and 2016 prices.*

Strong Industry Support

$5.6M Dairy Australia Virtual Herding Application Trials on Farms in 2017-18

Dairy Australia

University of New England

mla MEAT & LIVESTOCK AUSTRALIA

awi Australian Wool Innovation Limited

AUSTRALIAN Pork

tia TASMANIAN INSTITUTE OF AGRICULTURE

CSIRO

AGERSENS

THE UNIVERSITY OF MELBOURNE

THE UNIVERSITY OF SYDNEY

Collaboration Partners

Local and International

CQ University Australia

Mingenew-Irwin Group

University of Idaho

agresearch
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agribusiness G21 Forum

FARMIN
SENSING THE FUTURE

GALLAGHER

NSW Government Local Land Services Murray

Goulburn Broken Catchment Management Authority

North East Catchment Management Authority

Victoria State Government Environment, Land, Water and Planning

Board of Directors

Ian Reilly, Founder & CEO

- Sheep and cattle farming family
- Successful track record developing new tech products for global markets
- Developing defence & aerospace, consumer, industrial, medical products
- Australian and international innovation awards

Andrew Maxwell, Chairman

- 30 year successful entrepreneur
- Global business builder
- Venture capital manager
- Corporate finance

Paul Weller, Dairy Farmer

- Dairy farmer and former Director of Murray Goulburn Dairy Co-Op
- Past President Victorian Farmers Fed.
- Former MP, National Party, Victoria

Mark Harris, Gallagher

- Global marketing of livestock products
- Global market, product, and sales & distribution experience
- Dairy farmer

Lucinda Corrigan, Beef

- Beef farmer & industry thought leader
- Livestock systems, supply chain innovation
- Former Director, MLA

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Productive, profitable and sustainable farms