Farming and Decision Making Is it Tools, Gut feel, Luck or What???? that leads to success?

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Rural Research and Development for Profit
Keeping Australian farmers at the cutting edge

Australian Government
Department of Agriculture and Water Resources

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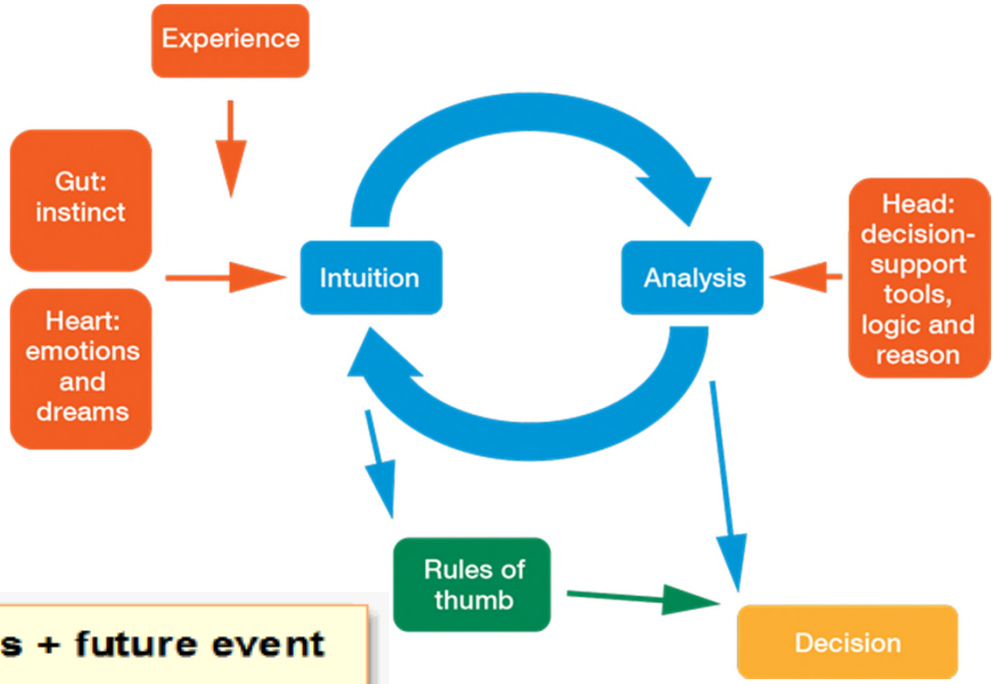
- Turning research into more profit on the farm
- Management is key to profitability
- Better Decisions increase chance of success. (But don’t Guarantee it!)
- Which Innovations and Adaptations are going to increase profitability which by its nature may well increase risk

- Decision Making Process

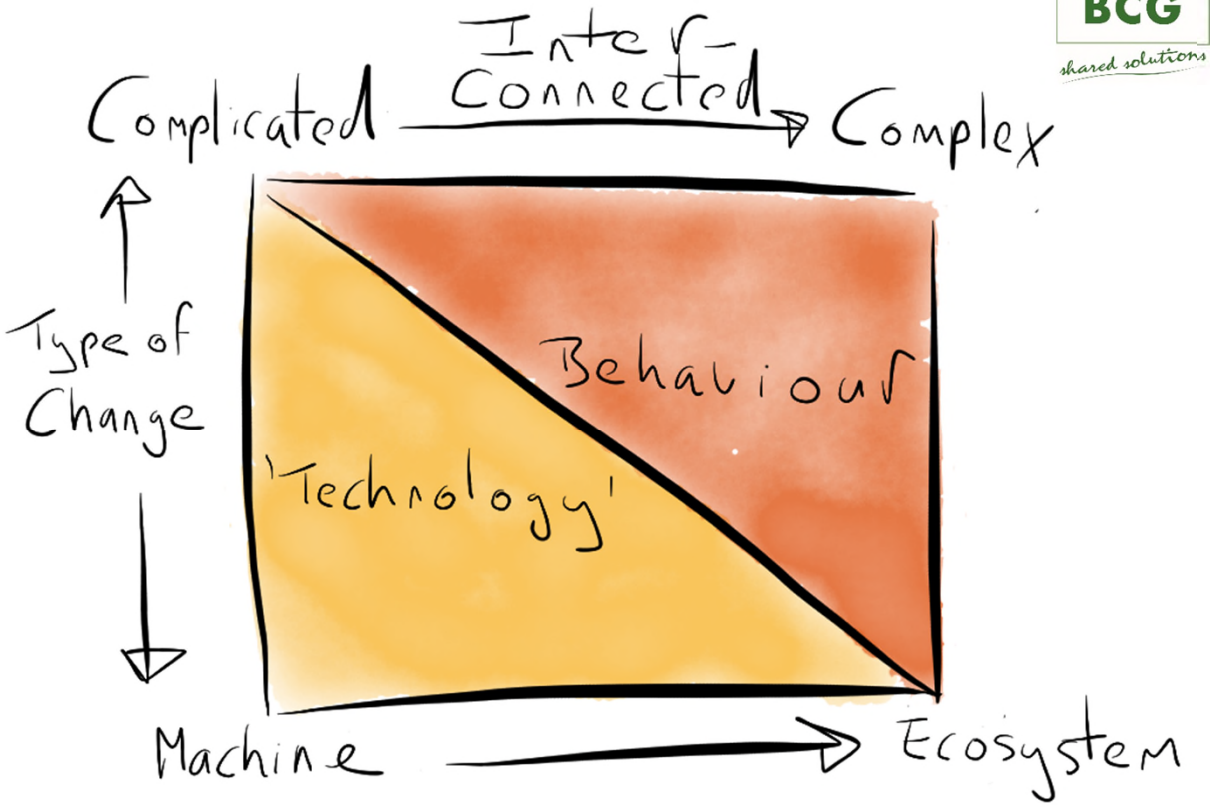


Outcome of a future event = current conditions + future event

Recent Event	Now (a decision point)	Future Event
Recent climate history • Rainfall • Temperature • Soil Type • Previous crop	**Derived status** • Soil water • Nutrition • Disease • Weeds *(supported by observations)*	**Distribution of future conditions** • Climatology • Statistical seasonal forecasts • Dynamical (POAMA) forecast

Complicatedness is the measure of our ignorance: It calls for knowledge.

Complexity is the measure of surprise: it requires mastery.



Improved use of seasonal forecasting to increase farmer profitability

- Project 2a - Community of Practice
  - *A group of willing practitioners with a common sense of purpose who agree to work together to solve problems, share knowledge, cultivate best practice and foster innovation.*
- Project 2b - Develop and Tailor Products, Tools and Services
  - *Packaging, presenting and embedding resources using low barrier interaction mechanisms that align with existing farmer/adviser working contexts*

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Four Tools???

- Amongst many others

Yield Prophet – Nitrogen Tactical

Peter Hayman - Either Or Seasonal Tactical/Strategic

Grain or Graze Game – In Season Tactical

Farm 4 Prophet – Multi Year Tactical/strategic


FERTILISER AND IRRIGATION APPLICATIONS
CROP DETAILS
PADDOCK RAINFALL DATA
YIELD PROPHET SIMULATIONS
CLIMATE DATA
SOIL CLASSIFICATION
SOIL TEST
Monsoon
Tropical Depressions
West Coast Trough
Upper Level Trough
Trade Winds
Northwest Cloudbands
Easterly Trough
Sub-tropical Ridge (Winter)
Frontal Systems
Cut-off Lows
Sub-tropical Ridge (Summer)
Southern Annular Mode

	Plan A		
	Income	Cost	Profit
Driest	0	0	0
Below Normal	25	0	25
Normal	50	0	50
Above Normal	75	0	75
Wettest	100	0	100
	Plan B		
	Income	Cost	
Driest	0	50	-50
Below Normal	40	50	-10
Normal	100	50	50
Above Normal	200	50	150
Wettest	250	50	200

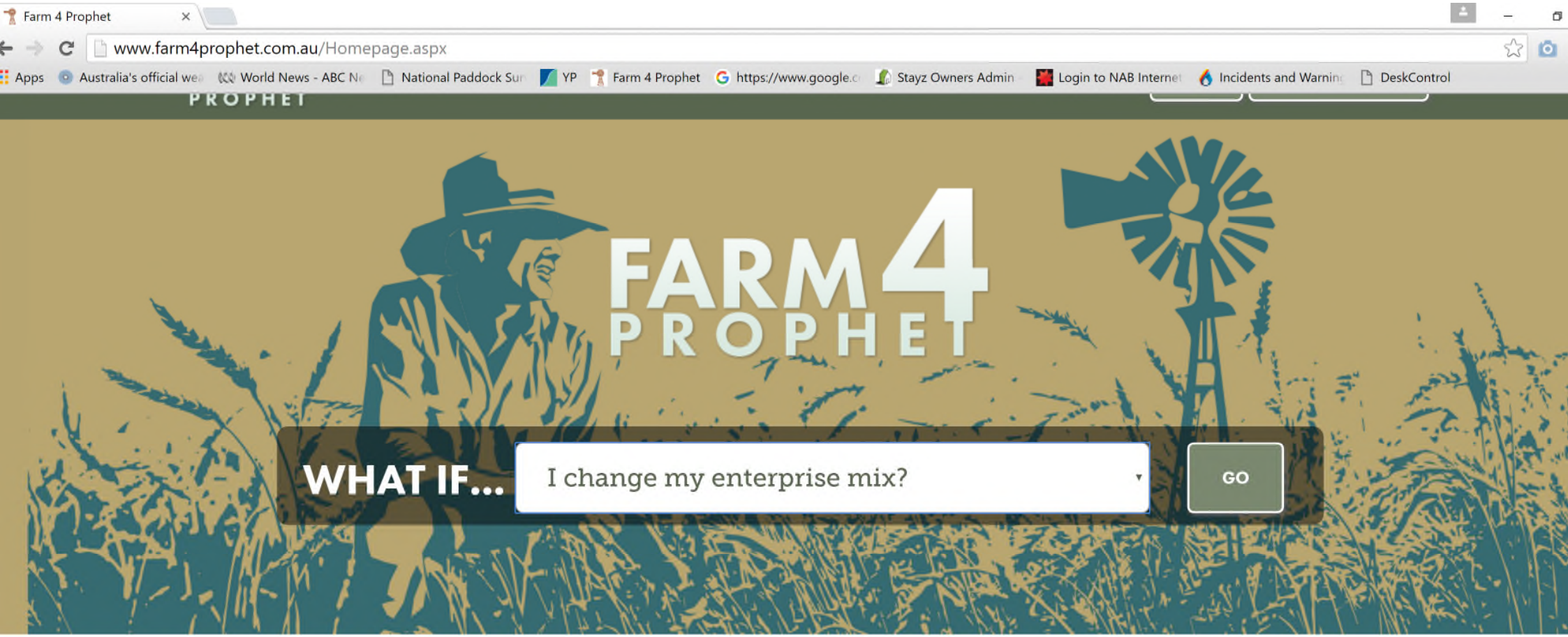
Grain and Graze Game

Crop Stage	GROSS MARGIN			
	INCOME			
	Grain Yield (t/ha)			-
	Grain Price ($/t)		$	-
	Gross Income		$	-
	VARIABLE COSTS			
Fallow	Herbicides	Roundup (1L/ha) + Goal (75ml/ha)	$	6.89
	Operation - Spray Pass		$	5.00
Fallow	Herbicides	Roundup (1L/ha) + Goal (75ml/ha)	$	6.89
	Operation - Spray Pass		$	5.00
Fallow	Herbicides	No Spray	$	-
	Operation - Spray Pass		$	-
Fallow	Herbicides	Roundup (1L/ha) + Goal (75ml/ha)	$	6.89
	Operation - Spray Pass		$	5.00
Pre-sowing	Herbicides	Roundup (1L/ha) + Ally (5g/ha)	$	15.14
	Operation - Spray Pass		$	5.00
	Soil Analysis	Phosphorus & Nitrogen Analysis	$	1.00
	Decision Support	Yield Prophet	$	0.90
Sowing	Herbicides	-	$	-
	Operation - Spray Pass		$	-
	Fertiliser	No Fertiliser	$	-
	Operation - Pre-drill pass		$	-
Sowing	Seed dressing	-	$	-
	Fertiliser	-	$	-
	Fertiliser Dressing	-	$	-
	Operation - Sowing Pass		$	24.00
Tillering	Herbicies	-	$	-
	Operation - Spray Pass		$	-
	Fertiliser	-	$	-
	Operation - Spreader Pass		$	-
Tillering	Herbicides	-	$	-
	Insecticides	-	$	-
	Operation - Spray Pass		$	-
	Fertiliser	-	$	-
	Operation - Spreader Pass		$	-
First Node	Fertiliser	-	$	-
	Operation - Spreader Pass		$	-
	Fungicide	-	$	-
	Operation - Spray Pass		$	-
Flag Leaf	Fertiliser	-	$	-
	Operation - Spreader Pass		$	-
	Fungicide	-	$	-
	Operation - Spray Pass		$	-
Flowering	Fertiliser	-	$	-
	Operation - Spreader Pass		$	-
Grain Filling	Late Season Weed Control	-	$	-
	Operation - Spray Pass		$	-
Ripening	Operation - Harvesting		$	-
	Operation - Freight		$	-
	Total Variable Costs		$	81.72
	GROSS MARGIN		-$	81.72

YIELD GAP	
Grain Yield Potential (t/ha)	-
Nitrogen Yield Gap (t/ha)	-
Phosphorus Yield Gap (t/ha)	-
Total Yield Gap (t/ha)	-

TOTAL PADDOCK PROFIT		
Gross Income ($/ha)	$	-
- Variable Costs ($/ha)	-$	81.72
Gross Margin	-$	81.72
- Overhead Costs ($/ha)	-$	66.67
- Depreciation Costs ($/ha)	-$	40.00
- Finance Costs ($/ha)	-$	16.67
- Personal Drawings ($/ha)	-$	33.33
Net Profit		

Farm4Prophet: Managing whole farm business risk in Australia



Test ideas and potential changes

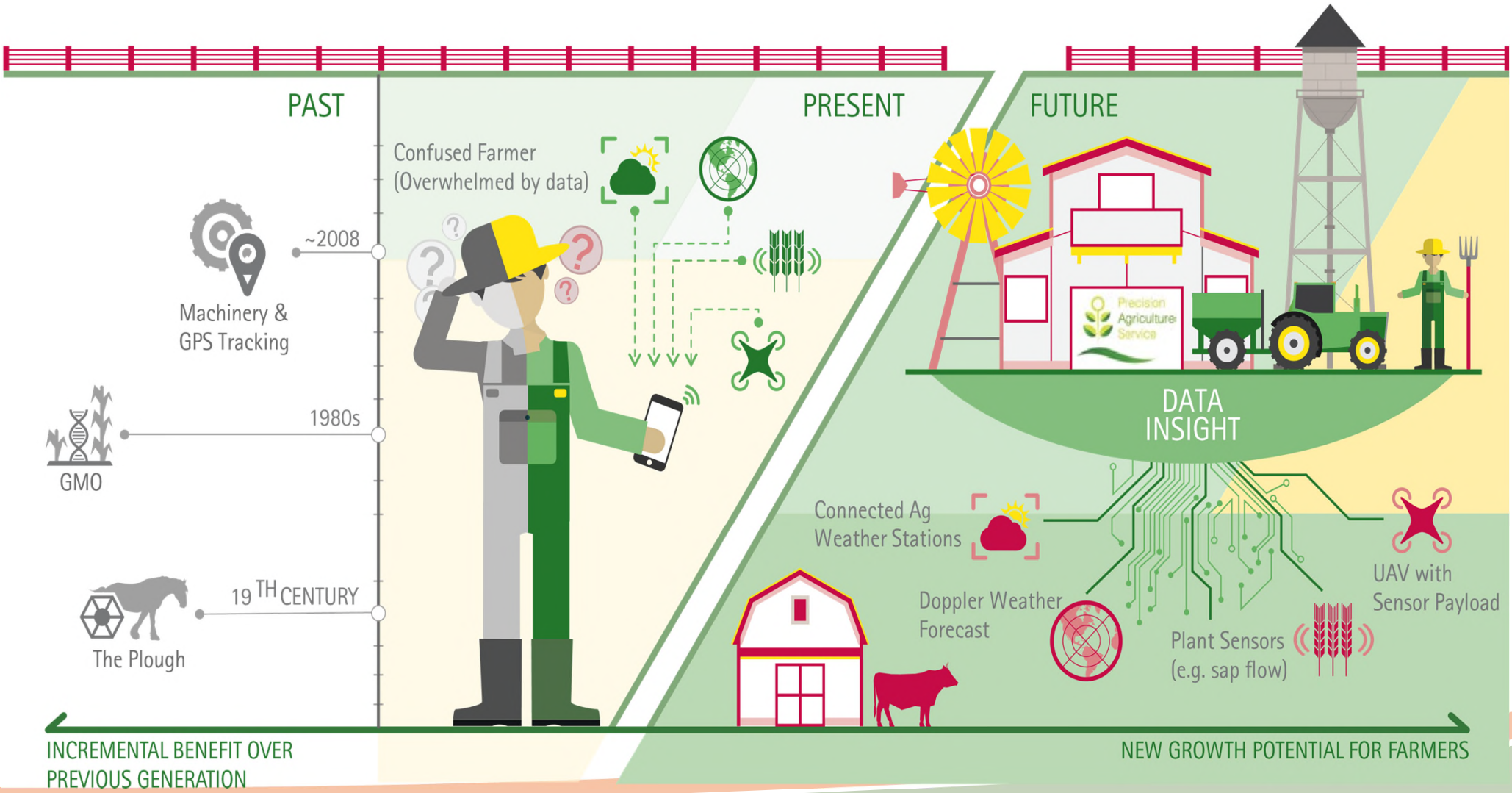
Australian Dept of Agriculture Funded

Free for 2016

Farm4Prophet is **a free service** available to

The Complex!!!!!
But can it be come less so

PA - Precision Agriculture
MPCI – Multi Peril Crop Insurance



Source Accenture Digital 2015

https://www.accenture.com/_acnmedia/Accenture/Conversion-Assets/DotCom/Documents/Global/PDF/Digital_3/Accenture-Digital-Agriculture-Point-of-View.pdf

Increased Farmer Profitability

Farmer Profitability per hectare being squeezed during increased seasonal climate variability and costs of inputs rising

Conservative Scenario 500,000 hectares gain profitability increase of $25 a hectare is an extra $12.5 Million in region by 2020

- ✓ 3 Million Hectares of Agricultural Land in Wimmera Mallee
- ✓ Accenture Digital farming report suggest a minimum of $125 hectare profitability increase available by 2020 with effective adoption of Precision Ag
- ✓ Agricultural Services Industry will need to double to meet demand - 500 plus jobs with at least 200 in the region (estimate)
- ✓ Private Enterprise are looking for ways to invest in region through employment and capital – However farmers are reluctant to start investing in curating data sets
- ✓ Farmers due to history, infrastructure, under investment in skills and capability are finding it hard to make it starting gate.

Lots of Noise – No Pathway

Many Service Providers keen to move into the space

Pixel Farmer Coop the catalyst to allow this investment to happen

Environmental Data (rainfall temperature wind) the basic building block to demonstrate value.

Pixel Farmer Data coop needed because:

- ✓ Innovation
- ✓ Data Collected = Better Decisions
- ✓ Farmer gets reward and control over data use
- ✓ Eases ability for private providers to employ people and grow Ag Productivity & Profitbility
- ✓ Better Data will ease burden of compliance, stewardship, traceability and premium market access.
  - ✓ Can link in with existing Open source globally backed platforms

Income Volatility – The problem
Many Solutions including Multi Peril Crop Insurance

- Crop Yield Insurance
- Revenue Insurance
- Input insurance
- Weather Derivates
- Off Farm Investment
- Business Diversification
- Downstream Value Chain Capture
- Alternative Labour Use
- Alternative Capital Use

Underlying Insurance Issues

- Systemic Risk
- Asymmetric information
- Adverse Selection
- Moral Hazard
- Lack of Data

Affordability

- Cost barriers
- Alternatives
- Financial literacy

Regulatory and Policy

- Ex post support by government
- Ad hoc Govt Assistance