Optimising Pasture performance

Basil Doonan

Pinion Advisory

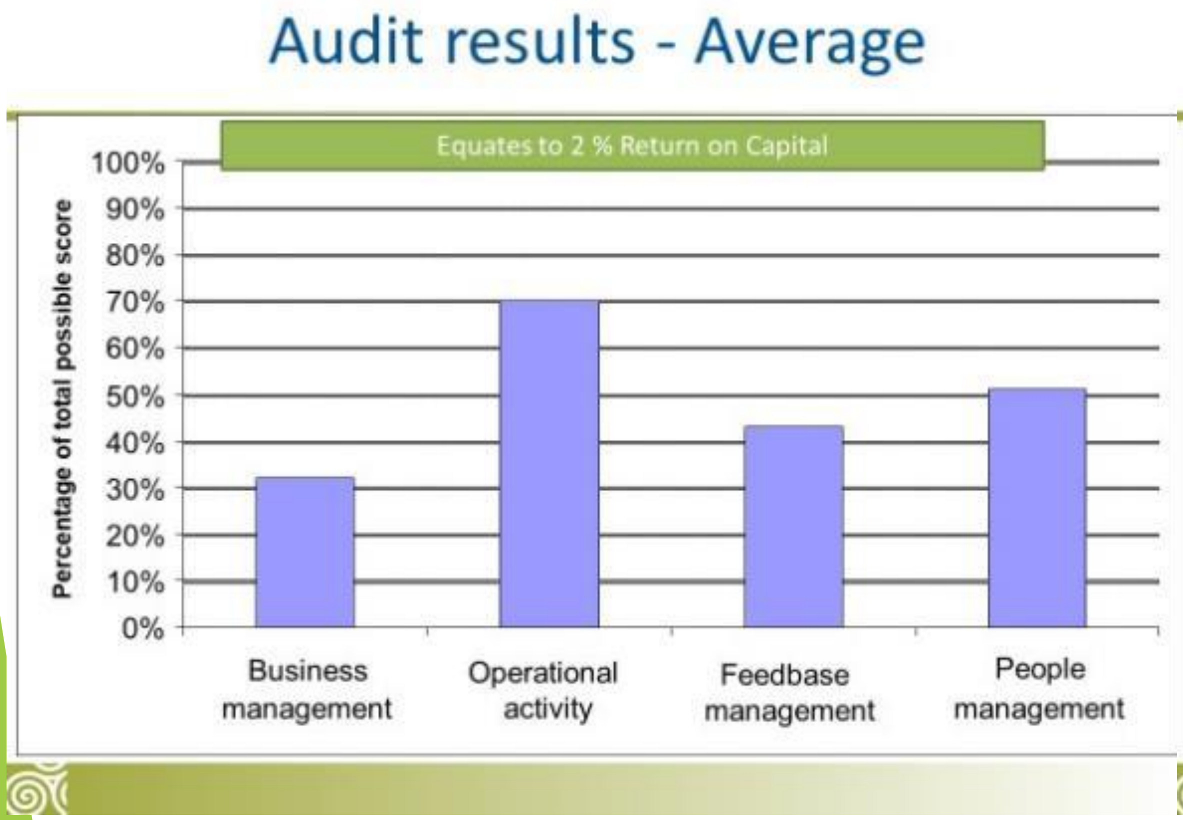
In reality….

Practice/capability

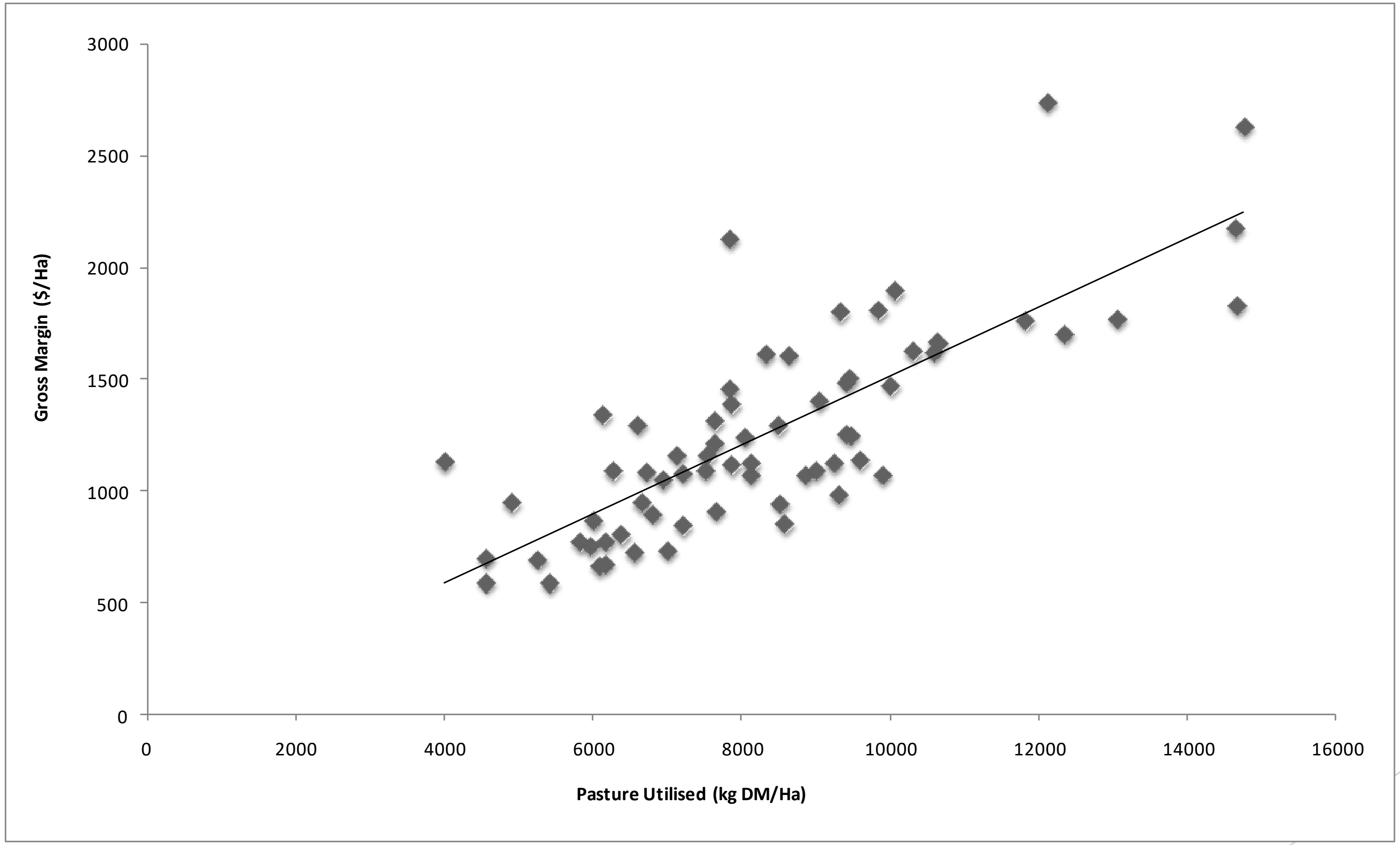
	Profit
Feedbase	70%
Business	40%
People	30%
Operational	15%

Hoekema, M 2002

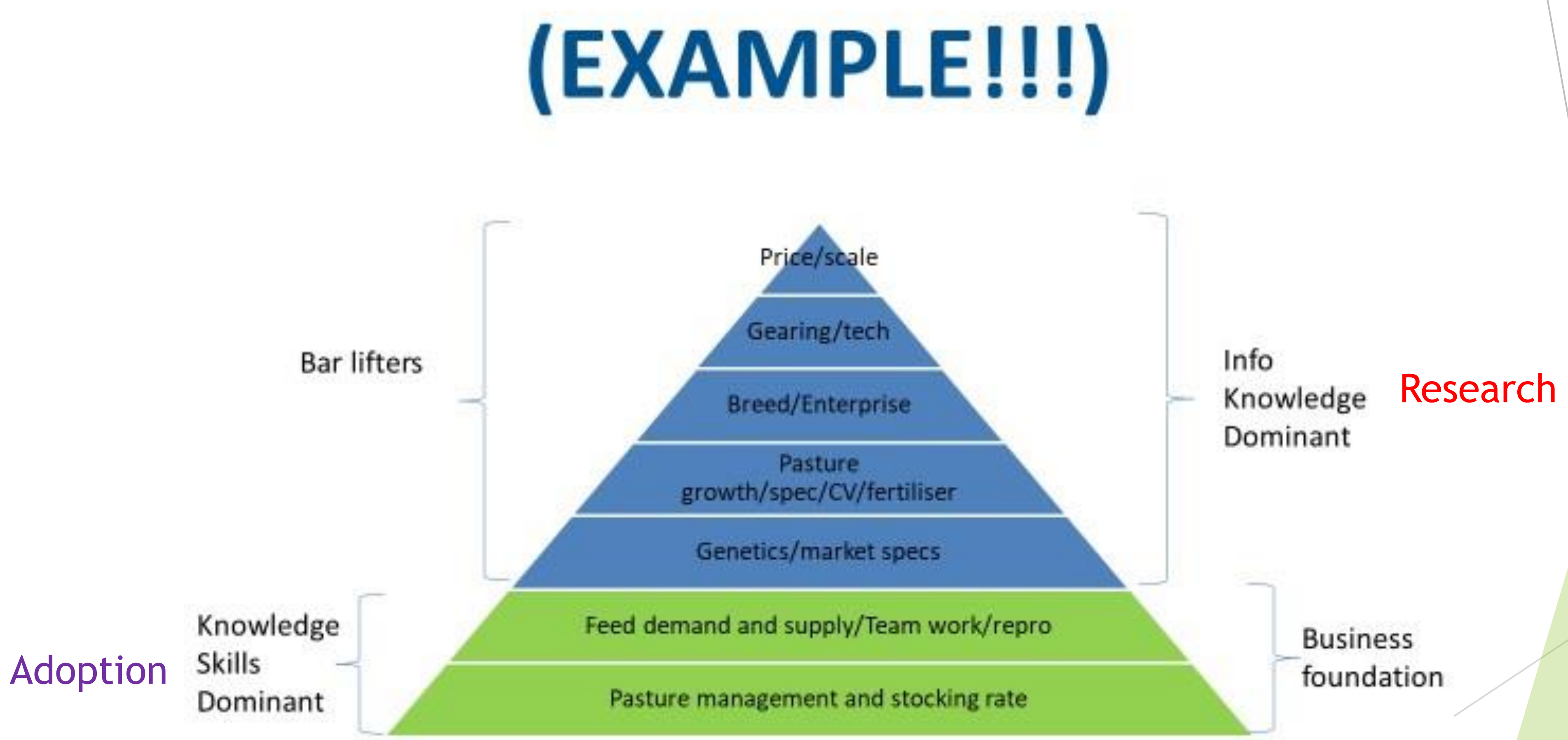
Best versus average



Linking productivity to profit



Business foundation

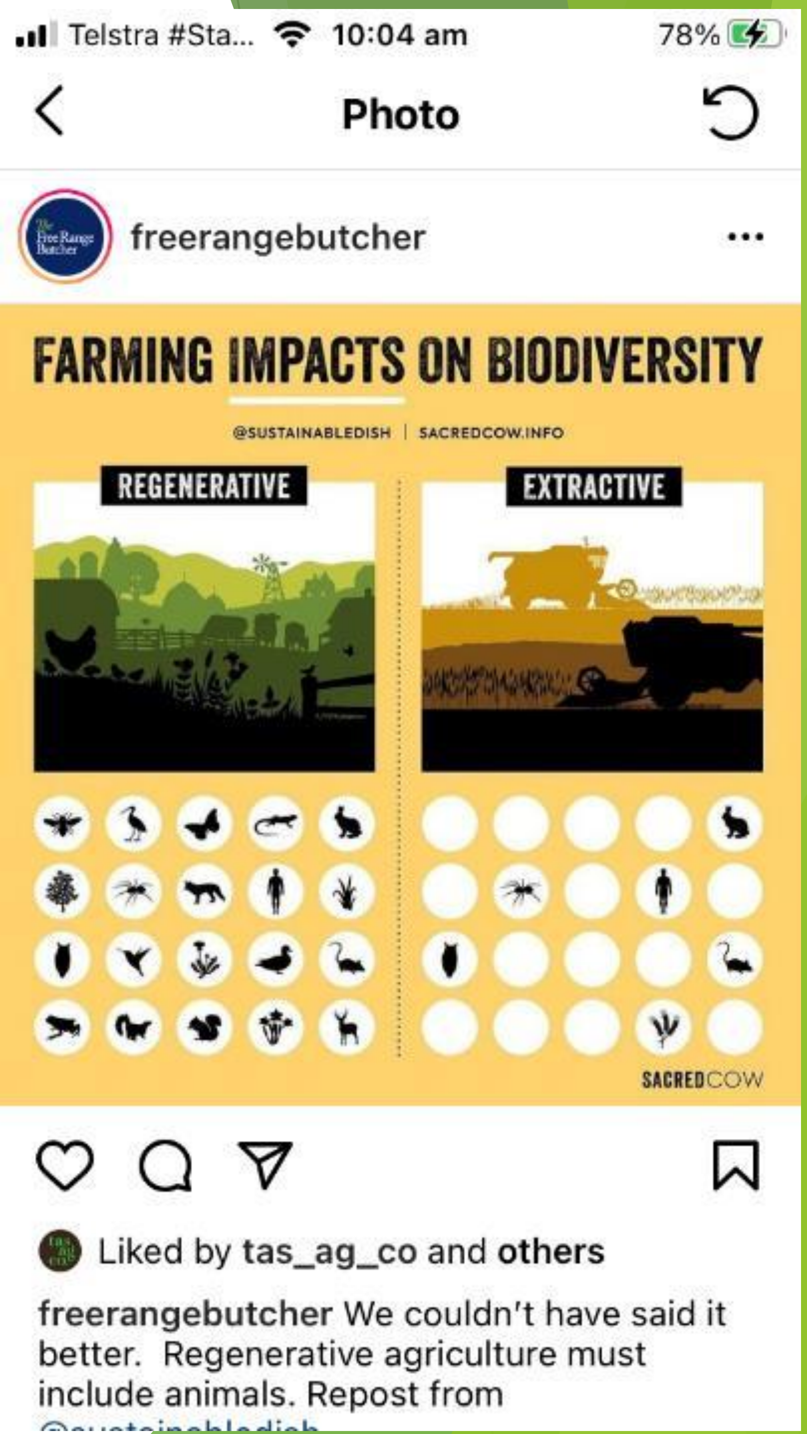


Methodology vs Practice

- Method
  - Set stocked → (Base case)
  - Rotational
    - Random movement → (No improvement/extra cost)
    - Strategic movement (Time)
    - Strategic movement (Rainfall)
    - Strategic movement (Ground cover/DM)
    - Strategic movement (Morphology)

Similar cost
Increasing
potential

- Practice/implementation
  - BMP requires skill
  - Anything else!



What's skill?

Getting the most out of your feedbase

- Work out the costs and benefits of the methods
  - Set stocked
  - Rotational
- Know your fodder flow
- Match your demand and supply
- Run a high stocking rate relative to carrying capacity
- Take control of the plant and animal interface

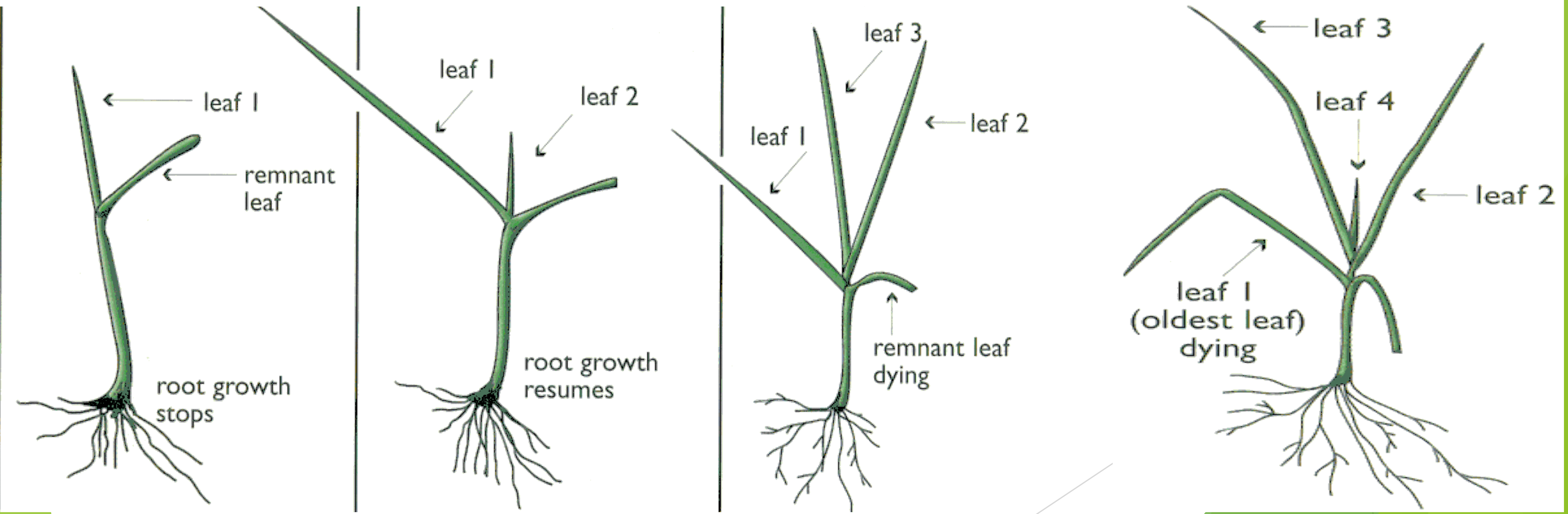
Work with mother nature

Methodology for optimising performance?

- Rotational grazing
  - 50-100% more grown
  - Rest must be based on morphology (physiology)
    - Quantity
    - Quality
    - Survival
  - Increased investment
    - Infrastructure
    - Time/labour?
    - Skill development

Plant process – Leaf stage

- Above ground



Plant process

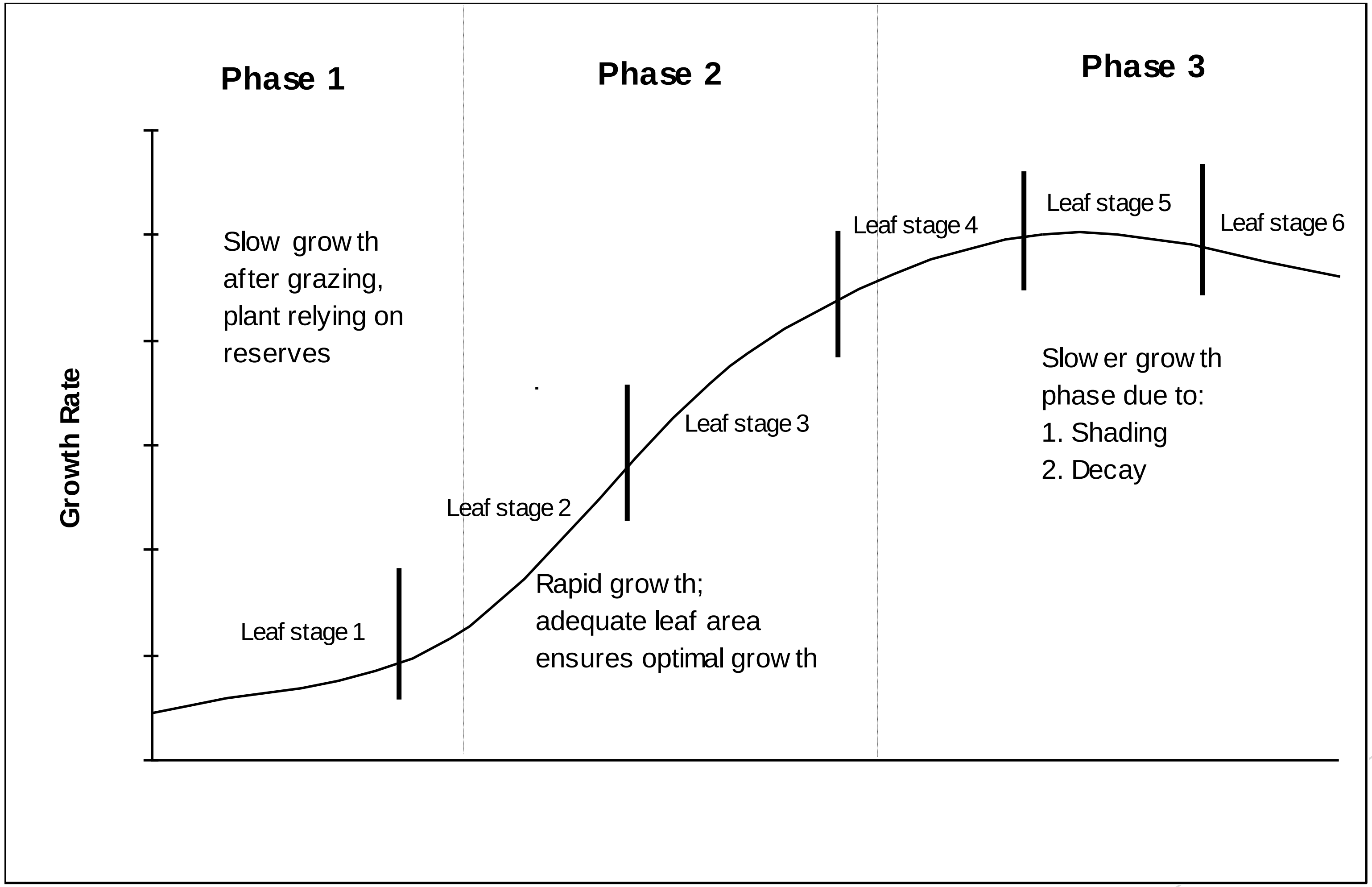
- Below ground

Right plant right place

Species	LS for Grazing
Ryegrass	2-3
Cocksfoot	3-4
Phalaris	4-5
Prairie Grass	4-5
Fescue	4-5
Kikuyu	2-5

The process

- How all plants grow



Regrowth: Late Phase 1

- When phase 1 is almost complete:
  - WSC begin to be stored again
  - Roots begin actively growing
  - But there's an imbalance in minerals
- At this stage, plants are very vulnerable to grazing

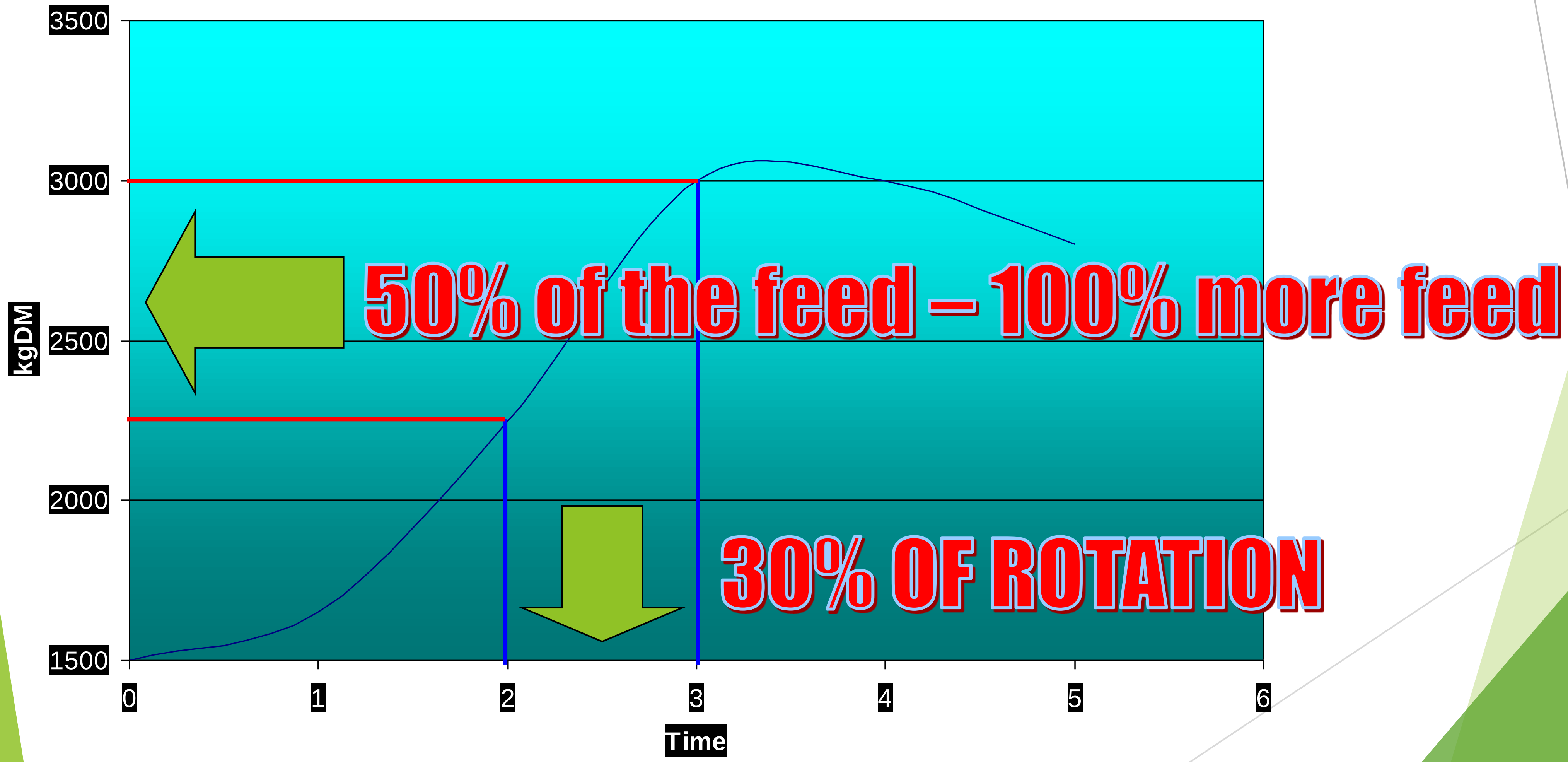
Regrowth: Late Phase 1 early Phase 2

- During this period:
  - WSC reserves have been built up enough for plants to be grazed again
  - Roots are actively growing
  - Tillering **starts** again
- The balance between minerals in leaves becomes more in line with animal requirements

Regrowth: Late Phase 2

- When phase 2 is complete:
  - WSC levels have been fully restored
  - Root growth and tillering are fully active
  - Overall live top growth is at a maximum
- After phase 2 quality declines due to leaf death

Quantity


3500
3000
2500
2000
1500
kgDM
0
1
2
3
4
5
6
Time
50% of the feed – 100% more feed
30% OF ROTATION

Quality

Phase	NSC/DIP	RDN (%)	Ca:P	K/(Ca + Mg)	Energy (MJ)
0-1	1:2	35	1:1	8	20%
1-1.5	1:1	25	1.5:1	4	50%
1.5-2	2:1	24	2:1	2.5	100%
Optimal	2:1	19	2:1	2.2	100%

Donaghy, D and Rawnsley, R: 2016

Quality

2 6.SEP.2007 15:13:42 03-5DAIRY BRANCH DPT 03 5573 0939 FEEDTEST NO.383 P.3/3 02/

Victoria Department of Primary Industries

FEEDTEST

A.B.N. 42 579 412 233
A BUSINESS OF THE DEPARTMENT OF PRIMARY INDUSTRIES

Victoria The Place To Be

Feed Analysis Report

DEPT PRIMARY IND & FISHERIES
PO BOX 303
DEVONPORT TAS 7310

Work Order: 07-08-098
Date Received: 14-Aug-07
Date Reported: 17-Aug-07

Work ID: TDDF Demostration Farm
Submitted by: Christopher Haynes

Each of your samples has been allocated a laboratory number and can be identified as follows:

Lab No	Your sample identification	Collected	By
02-A	Pasture, Ryegrass	13/08/07	

Results of Analysis:

Test	Method	Units	02-A
Moisture	Wet	%	84.1
Dry Matter	Wet	%	15.9
Crude Protein (N x 6.25)	NIR	% of dry matter	26.3
Neutral Detergent Fibre	NIR	% of dry matter	43.5
Digestibility (DMD)	NIR	% of dry matter	86.0
Digestibility (DOMD)	Calculated	% of dry matter	79.7
Metabolisable Energy	Calculated	MJ/kg DM	13.2

Quality

Poor digestibility

Moderate digestibility

Excellent digestibility

Quality

Poor digestibility

Excellent digestibility

Survival

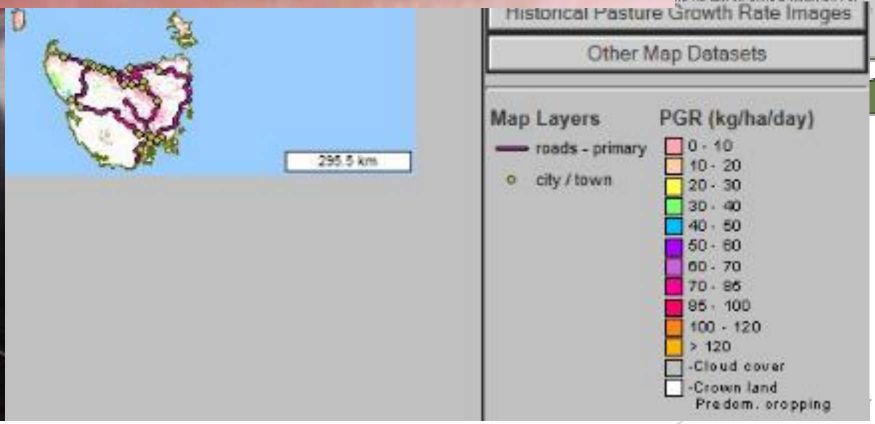
- Tillers live for roughly a year
- Overgrazing decreases energy reserves
  - Plants don't tiller
- If grazing duration is longer than 2-3 consecutive days
  - Plant energy reserves depleted (less than 1 leaf)
  - Regrowth is significantly compromised (10-30%)
- If greater than 5 consecutive days
  - Can lead to a 40-60% reduction in re-growth
  - And 40-50% tiller death

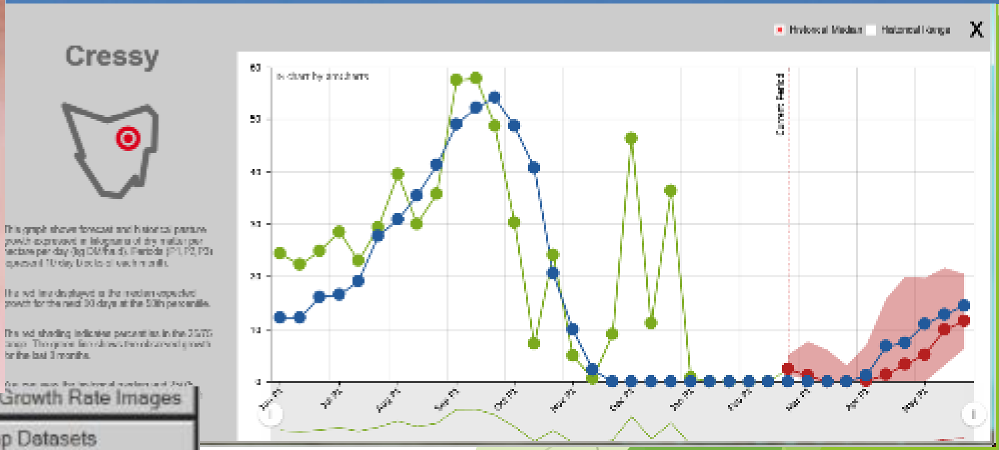
Fulkerson, W.
1986

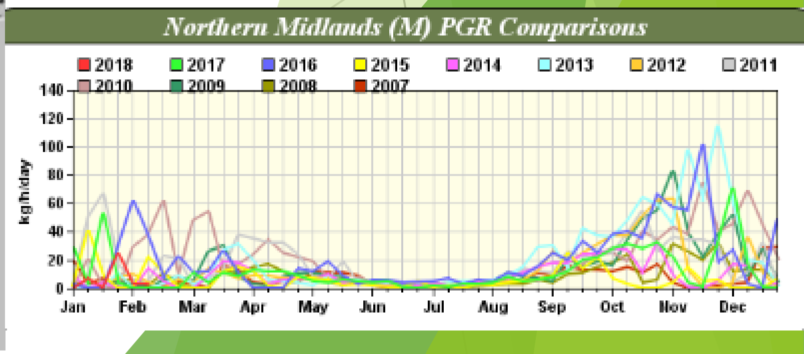
Rotation or rest

- Is a function of leaf appearance rate
  - Quality/quantity/survival
- Daily area fixed!
  - Nonnegotiable

Measuring Pasture







Animal requirements

- We use simple rules of thumb (kg DM/hd)
- Cattle
  - Maintenance (Lwt/100 + 1 kg DM)
  - Pregnancy (plus 1-3 kg DM)
  - Lactation (plus 4 kg DM)
  - Liveweight (for each kg Lwt add 4 kg DM)
- Sheep
  - Maintenance (2 x Lwt)/100
  - Pregnancy is plus (1 kg DM)
  - Lactation requires plus (1 kg DM/lamb)
  - Liveweight gain (plus 4 kg DM/kg LW)

The problem

	MJ	Pasture	
Maintenance	18754306	1875431	
Production	6226800	622680	
Purchased feed	0	0	
Total		2498111	
Total pasture utilisation /ha		3762	kgDM/ha
Pasture/ha for maintenance	75%	2824	kgDM/ha
Pasture/ha for beef production	25%	938	kgDM/ha
Cents per kilogram of Drymatter		$0.02	
DSE/ha		13.9	
ROC		2.4%	

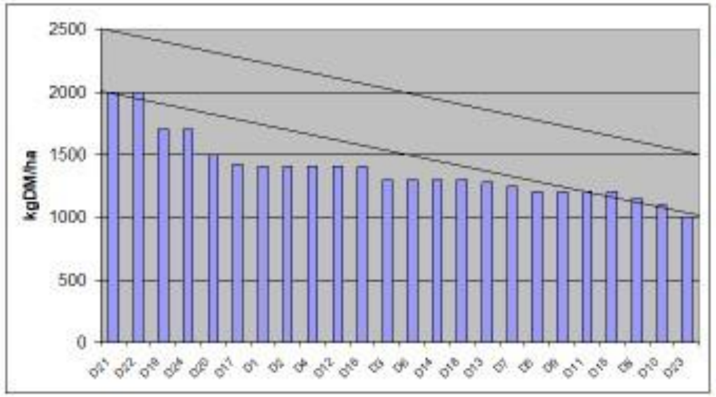
Solution

	MJ	Pasture	
Maintenance	18754306	1875431	
Production	12426800	1242680	
Purchased feed	0	0	
Total		3118111	
Total pasture utilisation /ha		4696	kgDM/ha
Pasture/ha for maintenance	60%	2824	kgDM/ha
Pasture/ha for beef production	40%	1872	kgDM/ha
Cents per kilogram of Drymatter		$0.01	
DSE/ha		17.3	
ROC		7.9%	

MLA - PDS

Lesters

- 60 ha
- Lileah (1,200 mm)
- Farm resource
  - Ryegrass/cocksfoot/white clover
  - Red soils
  - Good fertility
  - 24 paddocks
- 180 Trade cattle (average 300 kg)



Bruces

- 60 ha
- Stanley (700 mm)
- Farm resource
  - Ryegrass/Cocksfoot/Prairie grass
  - Sandy soils
  - Good fertility
  - 16 paddocks
- Multiple mobs/silage

Results – Physical

	Historical	PIRD Trial
Pasture eaten (kgDM/ha)	5,440	6,790
Pasture maintenance (kgDM/ha)	4,060	4,240
Pasture liveweight (kgDM/ha)	1,380	2,550
Pasture maintenance (%)	75	62
Pasture liveweight (%)	25	38

Iain Bruce 2008 Masters Paper

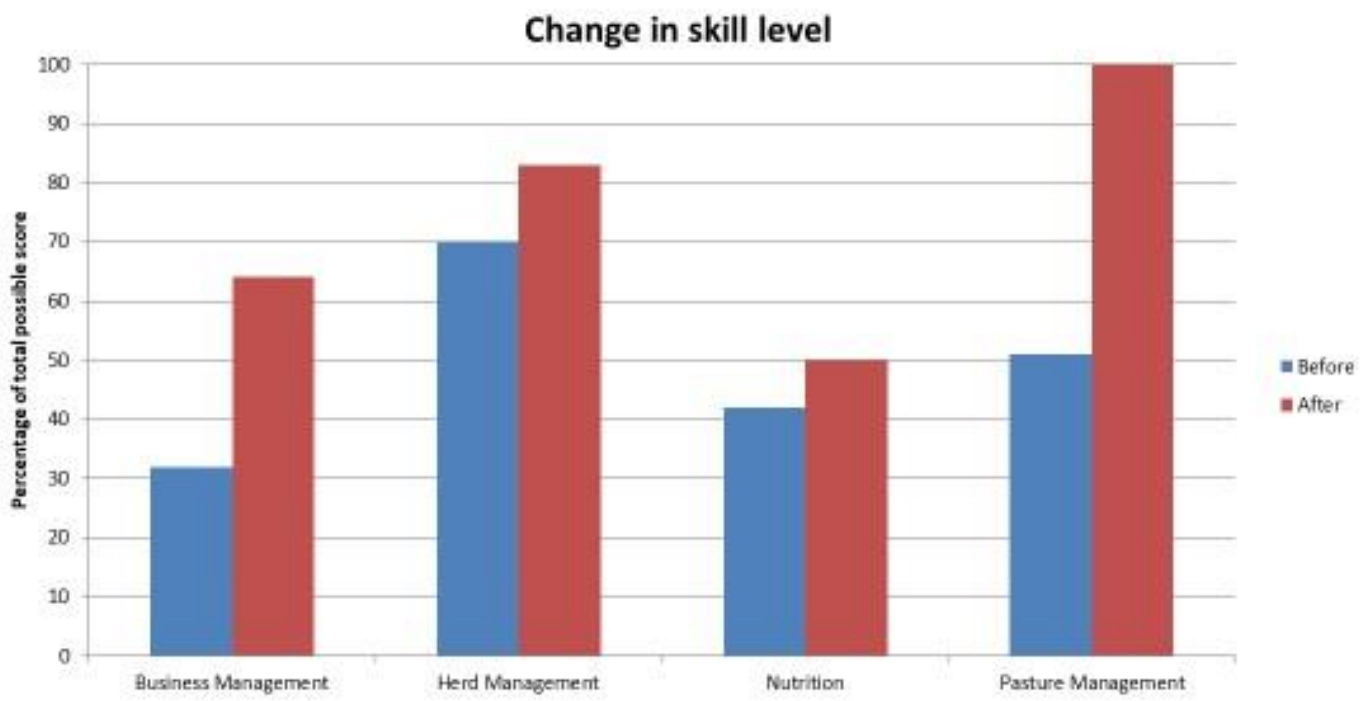
Results – Economic

	Before	After
Income	$319,000	$532,000
Variable costs	$129,000	$167,000
Gross margin	$191,000	$364,000
Overhead costs	$119,000	$128,000
EBIT	$72,000	$237,000
RoC	1.8%	5.6%

Iain Bruce 2008 Masters Paper

Practice

Results - skill



Case Study - Landfall

- Archer family
- Sheep and Cattle
- 700 mm rainfall

LANDFALL ANGUS

	2011	2012	2013	2014	2015	2016	2017	2018	2019	% Change
Total Effective Area (ha)	2,100	2,100	2,250	2,250	2,100	2,100	2,420	2,420	2,550	21%
Irrigated Area (ha)	220	220	220	250	250	250	260	280	280	27%
MWSR (DSE/ha)	11.8	14.1	14.3	13.3	15.3	15.2	14.1	14.7	15.9	42%
AASR (DSE/ha)	17.7	21.2	21.5	20.0	27.5	27.4	28.3	29.3	31.8	80%

Case Study - Nosswick

NOSSWICK PTY LTD

- Colvin family
- Sheep
- 550 mm rainfall

	2013	2014	2015	2016	2017	2018	2019	% Change
Total Effective Area (ha)	435	435	435	435	435	435	435	0%
Irrigated Area (ha)	200	200	200	200	200	200	200	0%
MWSR (DSE/ha)	9.0	13.3	14.9	16.9	17.6	17.9	17.9	99%
AASR (DSE/ha)	14.2	21.0	24.1	27.9	30.2	31.8	33.1	133%

Case Study - Skyhaven

- Chris MacQueen
- Breeder
- 750 mm rainfall

	2014	2015	2016	2017	2018	2019	2020	% change
Total effective area (ha)	640	818	885	922	950	955	955	49%
Irrigated area (ha)	0	0	0	0	0	0	0	0%
Breeders	585	687	873	905	955	1008	1100	88%
MWSR (DSE/ha)	9	10	12	13	15	18	20	122%
AASR (DSE/ha)	12	12	14	19	22	26	28	133%
Profit/ha ($)	97	190	376	560	806	812	1,000	931%
ROC (%)	2.1	5.1	5.9	8.8	12.4	12	14	567%

We’re not alone?

- Each year Australian golfers spend $300m to upgrade their equipment
  - Over the last 10 years average handicap has increased
- They’re now hitting the ball further in the wrong direction
  - We always tend to believe that our skills are higher than they actually are!
  - That means we cant capitalise on the better clubs!

THANK YOU

bdoonan@pinionadvisory.com