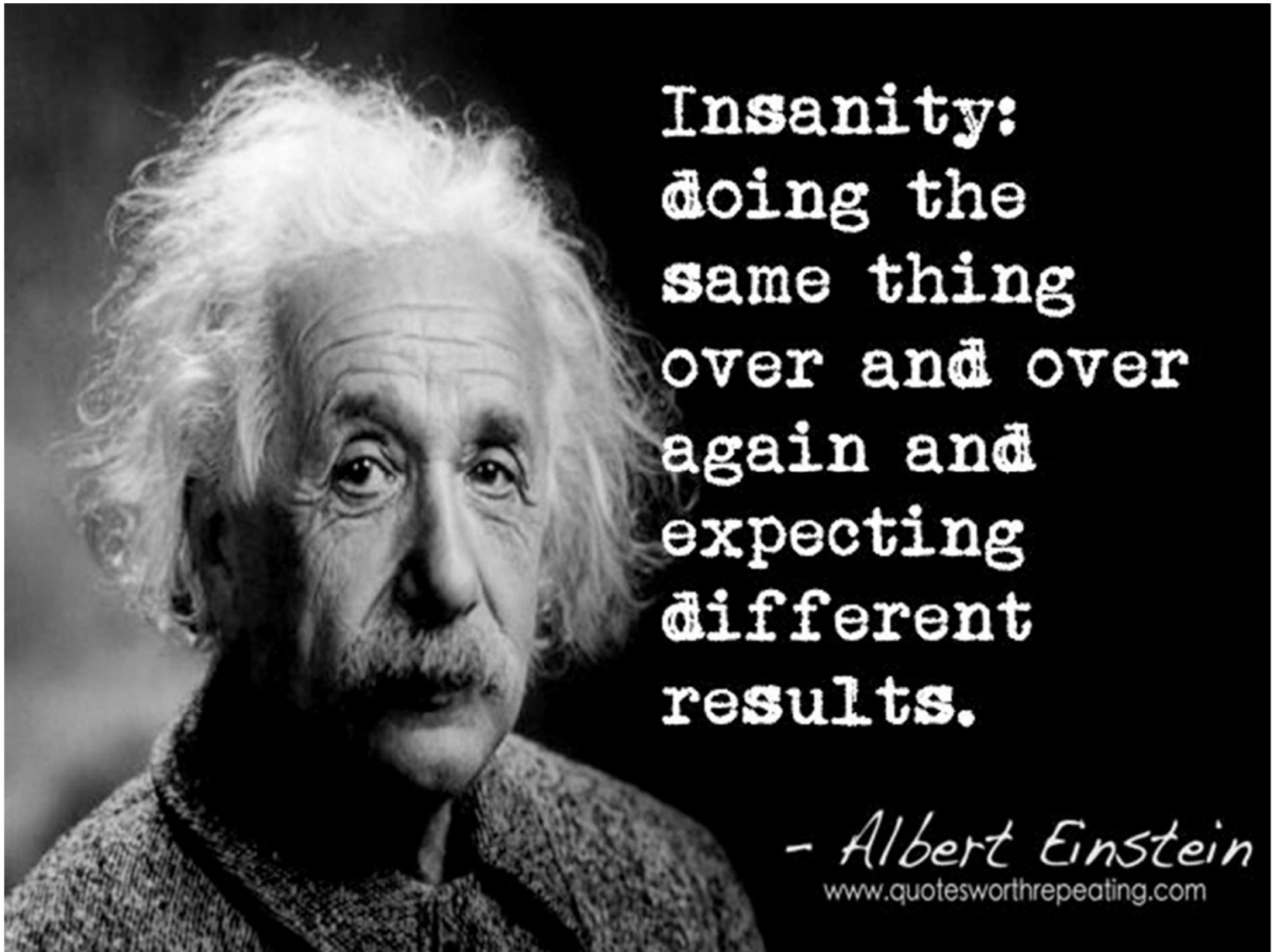




Pushing Pasture Production

Sheep Easy, August 2021



Insanity:
doing the
same thing
over and over
again and
expecting
different
results.

- Albert Einstein
www.quotesworthrepeating.com



Pushing Pasture Production

- Nutrition / Fertility
- Grazing Management
- Species / Density
- Nodulation
- Weeds / Insects



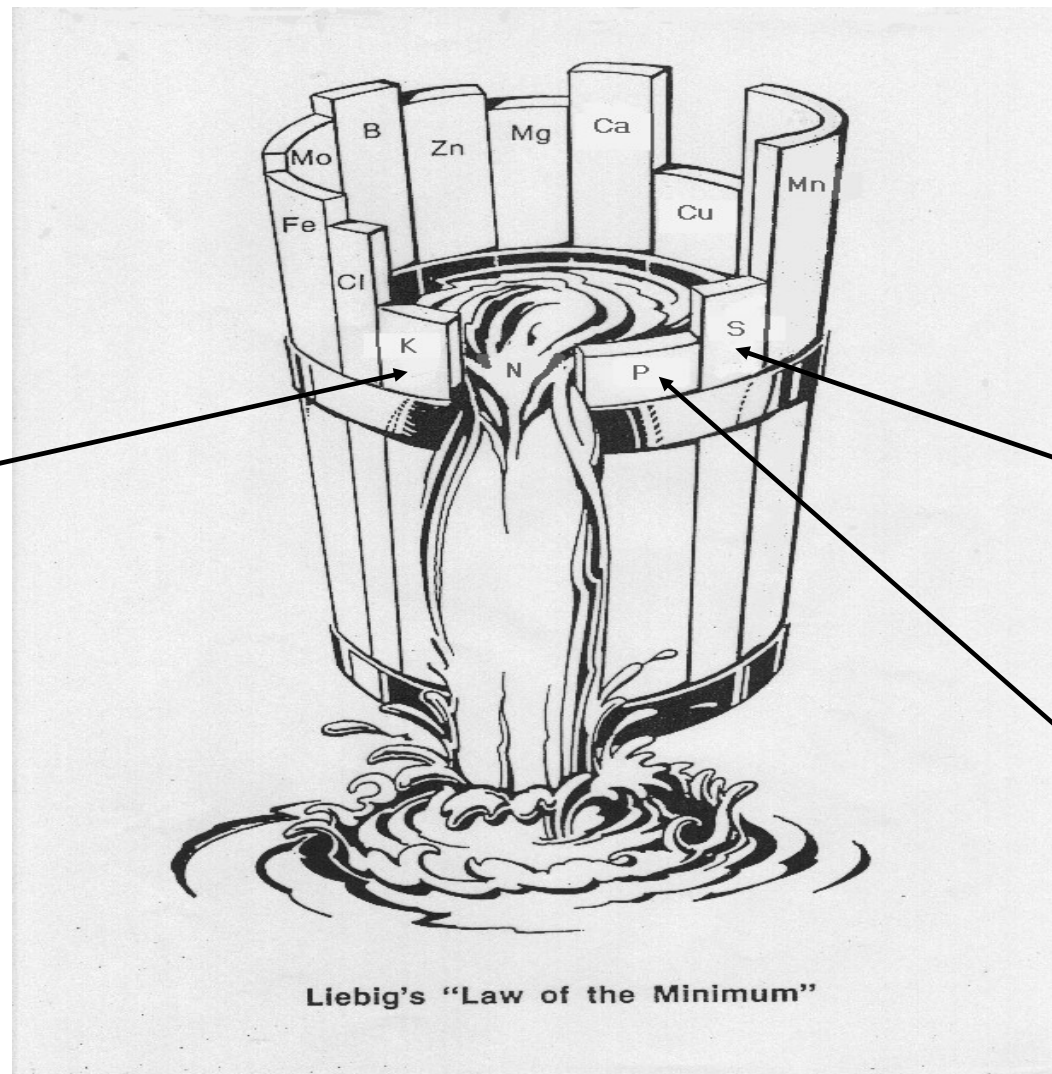
**Pasture
Productivity =
Potential**



Species

Grazing
Mgt

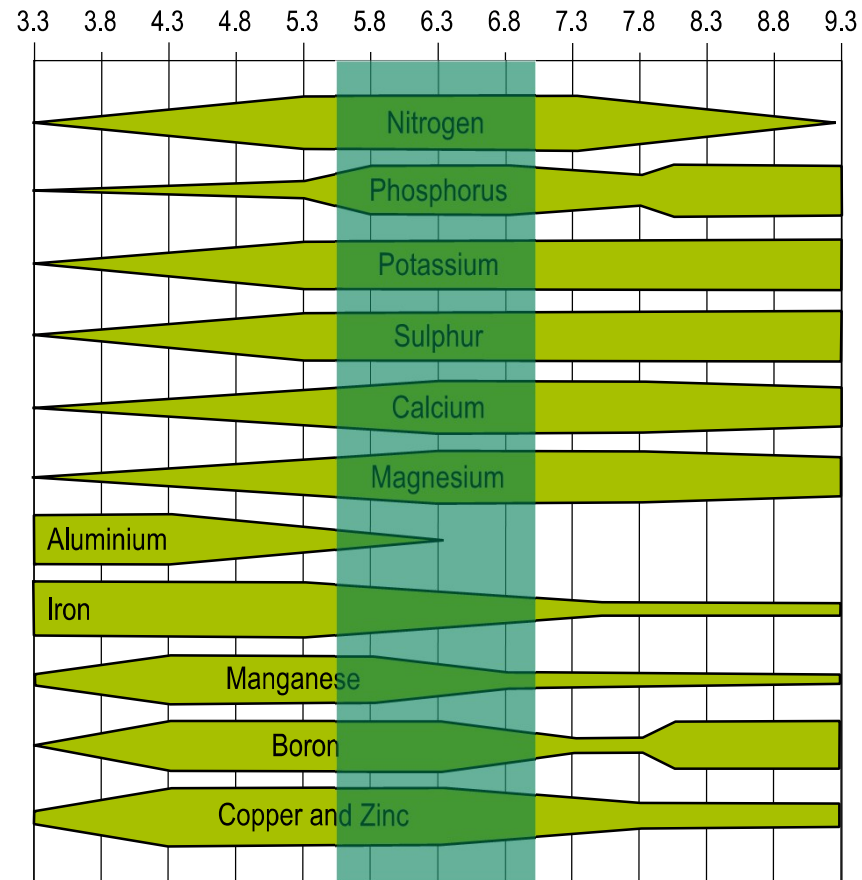
Weeds

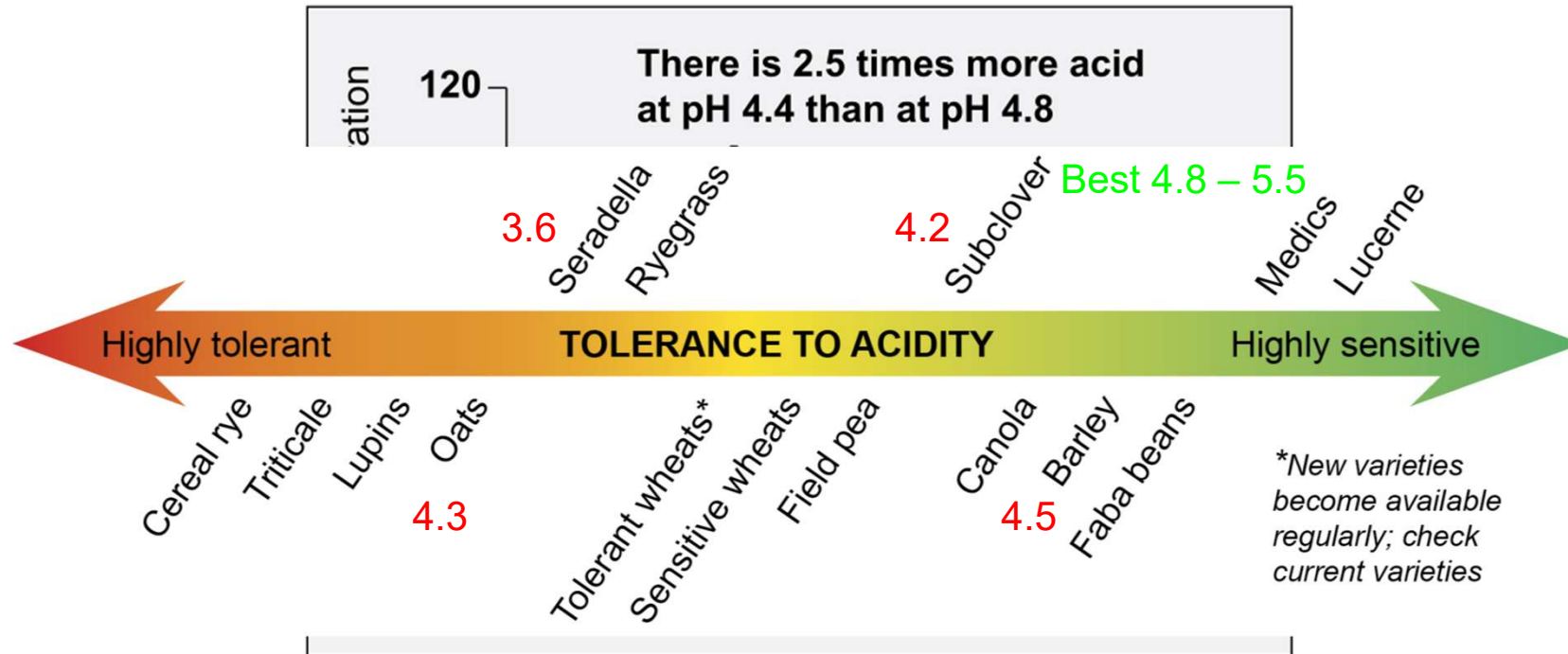


Liebig's "Law of the Minimum"

pH and nutrient availability

Strongly Acid Neutral Strongly Alkaline





Understand critical values by soil type:

- *Phosphorus*
- *Potassium*
- *Sulphur*
- *Cu*
- *Zn*

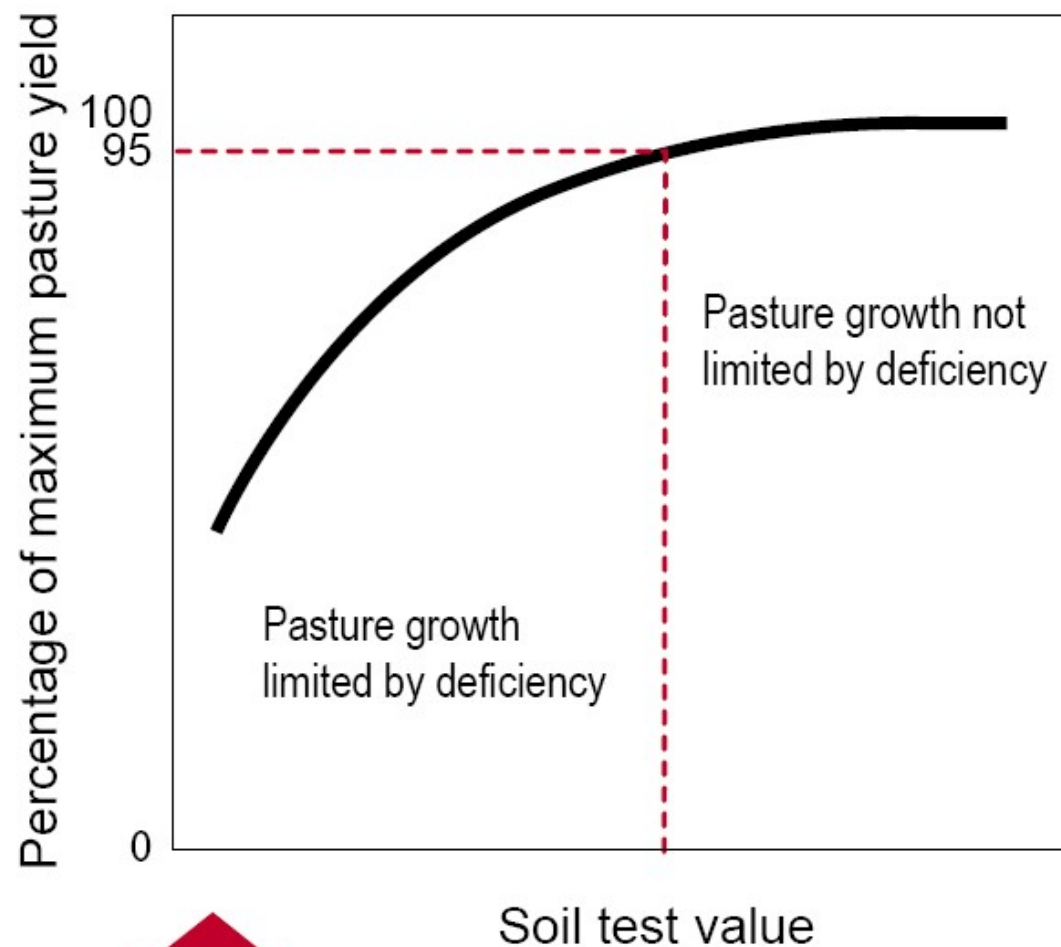


Figure 2.

Source: Making Better Fertiliser Decisions for Grazed Pastures in Australia

Nitrogen – Supplementary Feed

Nitrogen BMP

- Grass pasture
- Apply Post Grazing
- 30-50 N/ha
- 30 day min b4 grazing
- Prodigy can be a useful addition



Source: CSBP / Dan Parnell, Popanyinning ~early 2000's

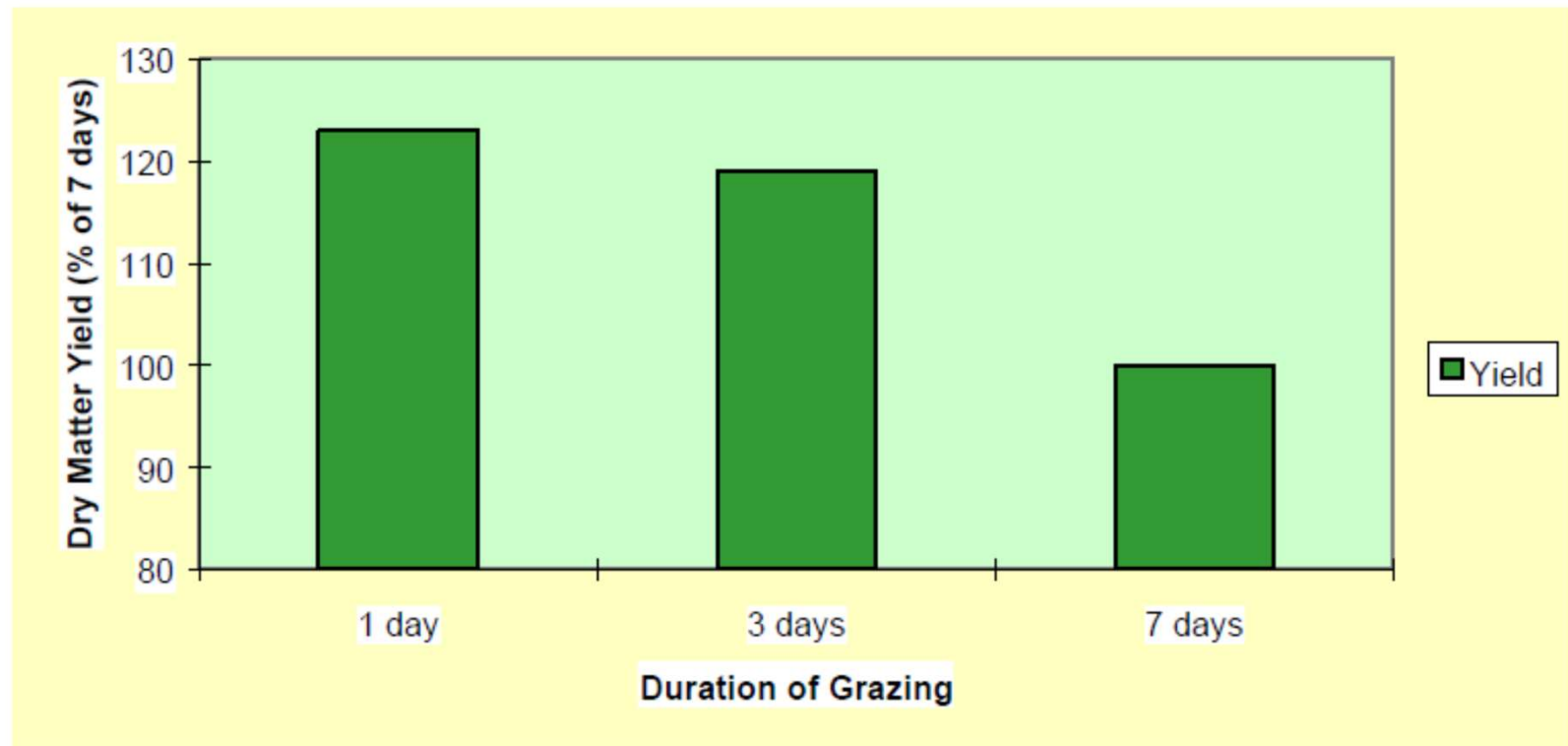
Grazing Management Considerations

- Set Stocked
- Rotational / Controlled / Cell / Deferred / Crash
- Lambing – Singles, Twins / Multiples
- Mob & Paddock Sizes
- Available FOO levels

**Manage grazing to enable desirable
species to produce to potential**

Time Based Grazing

Figure 6: Effect of duration of grazing on dry matter yield.

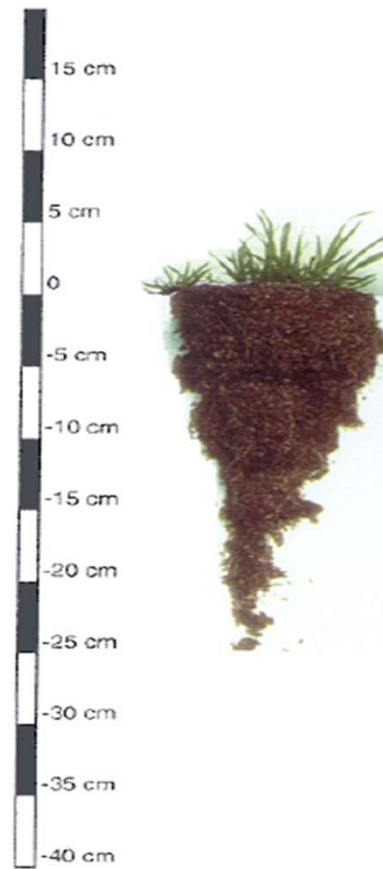


“Grazing paddocks for 7 days rather than 3 days reduces dry matter production by about 20%”

Source: Beef Pastures for Profit, AgWA - 1999

Why you need to control grazing!

Figure 5: Leaf and root development in ryegrass cut at 1, 2 and 3 leaves.

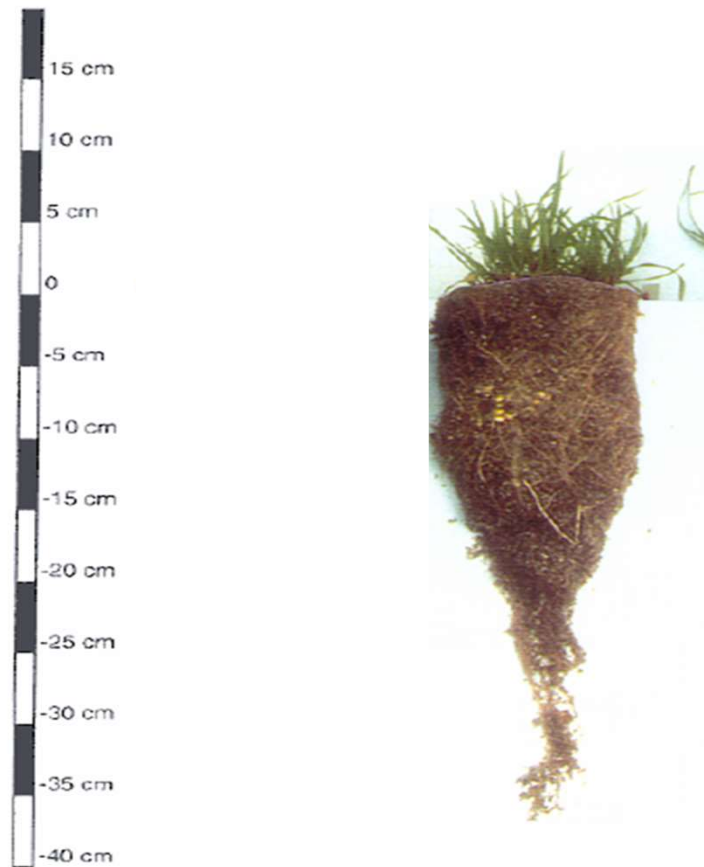


One Leaf

Source: Beef Pastures for Profit, AgWA - 1999

Why you need to control grazing!

Figure 5: Leaf and root development in ryegrass cut at 1, 2 and 3 leaves.

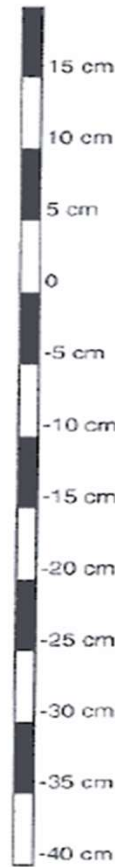


Two Leaves

Source: *Beef Pastures for Profit*, AgWA - 1999

Why you need to control grazing!

Figure 5: Leaf and root development in ryegrass cut at 1, 2 and 3 leaves.



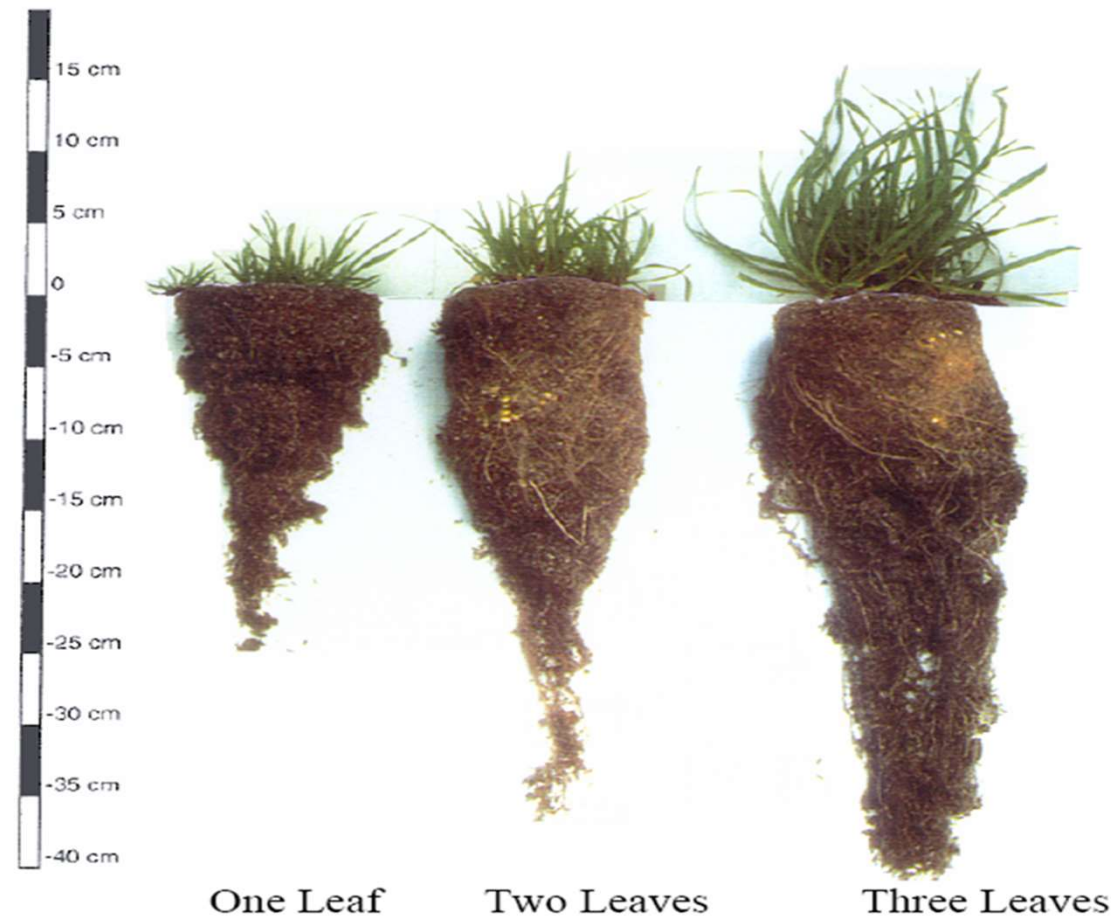
s

Three Leaves

Source: *Beef Pastures for Profit*, AgWA - 1999

Why you need to control grazing!

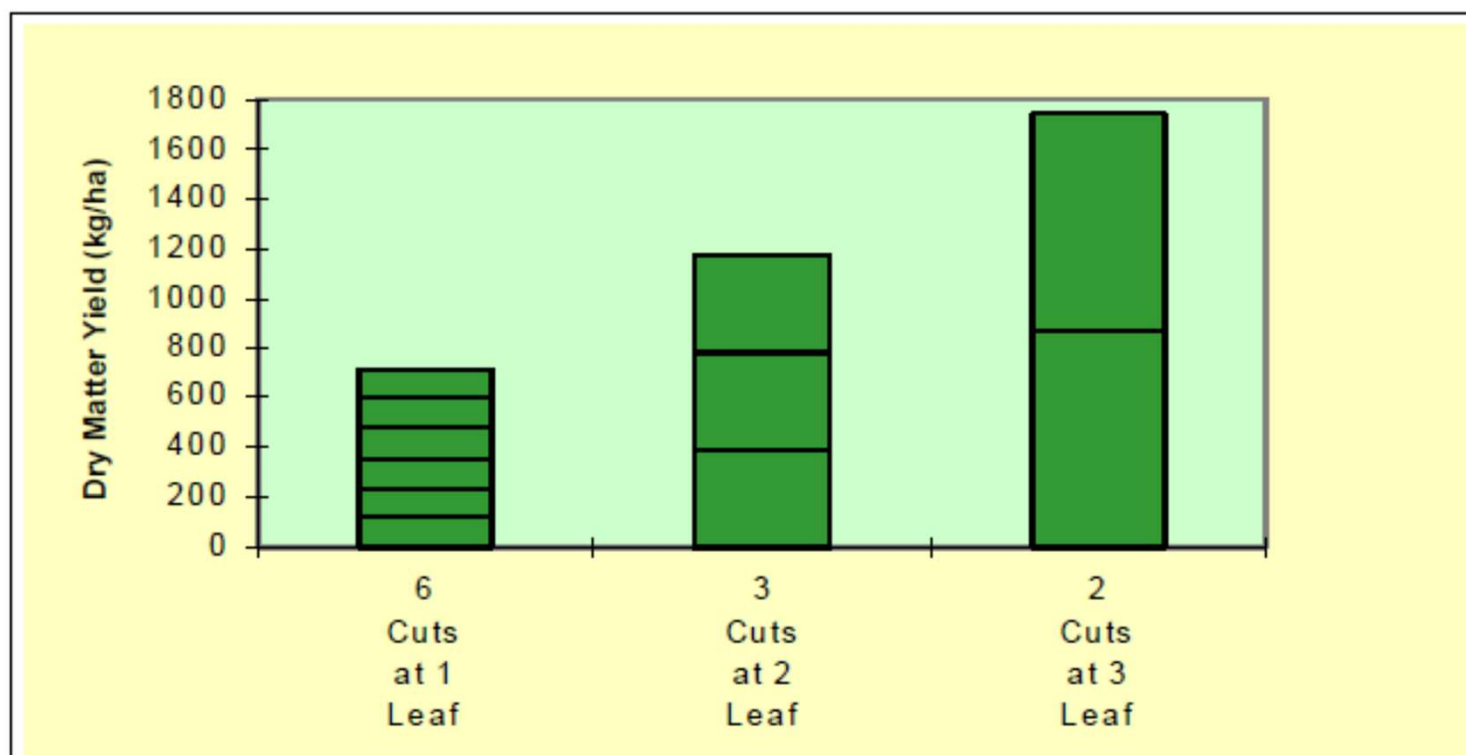
Figure 5: Leaf and root development in ryegrass cut at 1, 2 and 3 leaves.



Source: Beef Pastures for Profit, AgWA - 1999

Yield benefits of controlled grazing

Figure 4: Regrowth of Ryegrass following defoliation at the 1, 2 or 3 leaf stage.



Continual defoliation did not allow the plant to replace energy reserves used to grow the leaf and this stunted root and top development.

Source: Beef Pastures for Profit, AgWA - 1999

Sub Clover Grazing Mgt

- Seed softening and preparation for germination
Reduce DM cover to 1000 kg/ha DM 1 month before break
- Germination
Delay grazing until 3 trifoliate leaves established, targeting 20–30kg/ha of seed germinated or 30–45 plants in 0.1m²
- Vegetative growth
Graze frequently and maintain optimal ground cover down to 1,000kg DM/ha to increase sub-clover content (1200-1400 kg DM optimal FOO targets)
- Flowering
Reduce grazing pressure at flowering to maximise seed production
- Burr burial
Avoid overgrazing to the point where the surface burr is grazed.

Source: MLA Five steps to productive sub-clover



**Manage grazing to allow desirable
species to produce to potential**

Composition =

Legumes / Ryegrass / BLW / Grass Weeds / Dead Material & Bare Earth

60 / 40 Ryegrass Clover?? – is this ideal??

“The optimum density in young pastures is 30% to 50% (2500 – 4000 ryegrass tillers per square metre)” – Source Beef Pastures for Profit, Ag WA 1999.

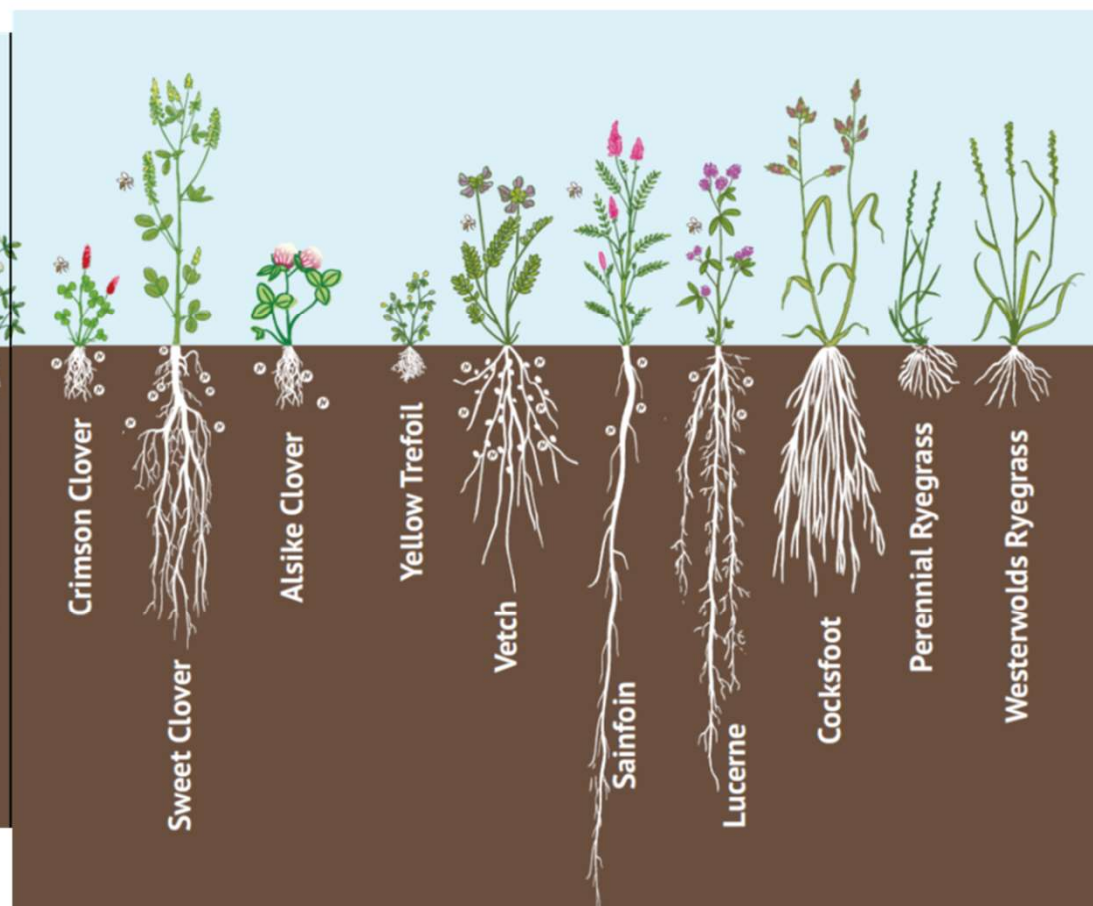
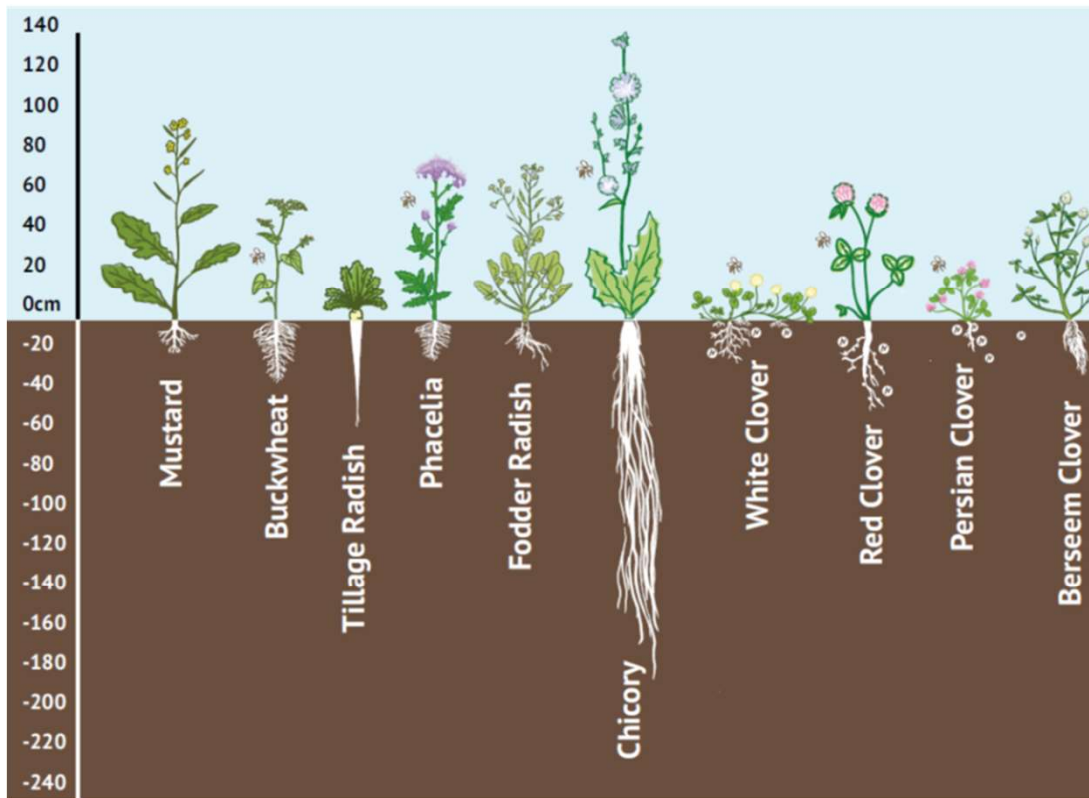
= 50-75 seed bearing heads/m² in spring, producing ~30 seeds per 10cm x 10cm square.

“A pasture of adequate sub-clover (40% sub-clover content by late winter) relies on the successful germination of 20–30kg/ha of seed or 30–45 plants in 0.1m²”

Source MLA 5 Steps to Productive Sub-Clover

- Sub Clover – early mid black seeded types
- Ryegrass – early diploid types
- Alternate Legumes – Aerial seeded clovers / Serradella
- Perennial Species
- Cereals for early feed
- Salt Tolerant

Species Rooting Depth – Using the Bucket!!



Healthy Clover Nodules

- Nodules close to crown
- Pink internal colour





□ New lower soil pH tolerant strains can provide a production edge over background/paddock strains. Sub-clover growth comparison from the glasshouse. Control (no inoculation) vs. the paddock type (6N8) vs. the new commercial strains WSM409 & WSM1325 showing the production benefit.

Source: Farm Weekly January 2018

Well-nodulated roots of subterranean clover



16

PHOTO: R. BALLARD

Annual clovers *Trifolium* species

(SUBTERRANEAN, BALANSA, PERSIAN, BLADDER, ARROWLEAF, ROSE, GLAND, CRIMSON, PURPLE, CUPPED AND HELMET)

INOCULANT GROUP C (STRAIN WSM1325)

ANNUAL CLOVERS AND RHIZOBIA

- Inoculation is essential for gland, bladder and arrow-leaf clovers and recommended for all other annual clovers

ANNUAL CLOVER INOCULATION

- Most commonly applied as a slurry of peat followed by pelleting with fine lime or other suitable product
- All inoculant formulation types can be used
- Seed often purchased already inoculated. Check time from inoculation not more than six weeks. Freshly inoculated seed is best

ASSESSMENT OF NODULATION

- Good: 50 – 100 pink nodules per plant after 8 weeks of growth

LIKELIHOOD OF CROP RESPONSE TO INOCULATION

HIGH	Gland, bladder and arrowleaf clovers; no previous annual clover grown in paddock; soils with pH (CaCl ₂) below 5.0; where soil is tilled at pasture renovation
MODERATE	No annual clover host in past 4 years and soil pH (CaCl ₂) below 5.5; annual clover present, but growth or nodulation below expectation
LOW	Soils with neutral or alkaline pH and recent history of good clover growth and nodulation

Source: GRDC Inoculating Legumes – The Back Pocket Guide

Nodule scoring system



0	0.5	1	2	3	4	5	6	7	8
Absent	Ineffective	Rare (Effective)	Scarce	Moderate	Adequate	Ample	Abundant	Very Abundant	Extremely Abundant
No nodules	White ineffective nodules	0 - 5 small pink nodules	6 - 10 small pink nodules	11 - 20 small pink and/or 1-2 large pink nodules	21 - 40 small pink and/or 3 - 4 large pink nodules	< 40 small pink and/or 5 - 9 large pink nodules	≤ 10 large pink nodules	Crown nodulation < 5 mm diameter	Crown nodulation ≥ 5 mm diameter

Source: Yates, R.J., Abaidoo, R., and Howieson, J. 2016. Field experiments with rhizobia. Pages 145-166 in: Working with rhizobia, J. Howieson and M. Dilworth, eds. Australian Centre for International Agricultural Research, Canberra.

Insect & Weed Management

- Know your pests
 - Usual suspects eg RLEM & LF, Cutworm etc...
 - Capeweed, Radish, Geranium, Barley Grass...
- Consider the options
 - Cultural or Chemical
 - Grazing, Cutting, Cultivating, Spraying
- Get the timing right
 - Early control for best results

Summary

- Dense pastures will be most productive
 - Desirable species and lots of them
- Manage your limitations
 - Insects, Weeds, soil pH, Fertility
- Get Grazing Management Right
 - To maximise plant growth and recovery



Optimising Sub Clover <https://www.mla.com.au/globalassets/mla-corporate/research-and-development/program-areas/grazing-and-pasture-management/mla599---how-do-i-optimise-sub-clover-based-pastures--18.2.20.pdf>

MLA Healthy Soils - <https://www.mla.com.au/extension-training-and-tools/feedbase-hub/healthy-fertile-soils/>

Pasture Paramedic - <https://www.mla.com.au/extension-training-and-tools/tools-calculators/pasture-paramedic/>

High Rainfall Pasture Management - <https://www.agric.wa.gov.au/climate-land-water/land-use/high-rainfall-pastures>

Nodule Scoring System - <http://alosca.com.au/wp-content/uploads/2020/12/Screenshot-2020-12-03-113330-1.png>

Soil Condition Poster - https://www.mla.com.au/globalassets/mla-corporate/extensions-training-and-tools/documents/soil-poster_small.pdf