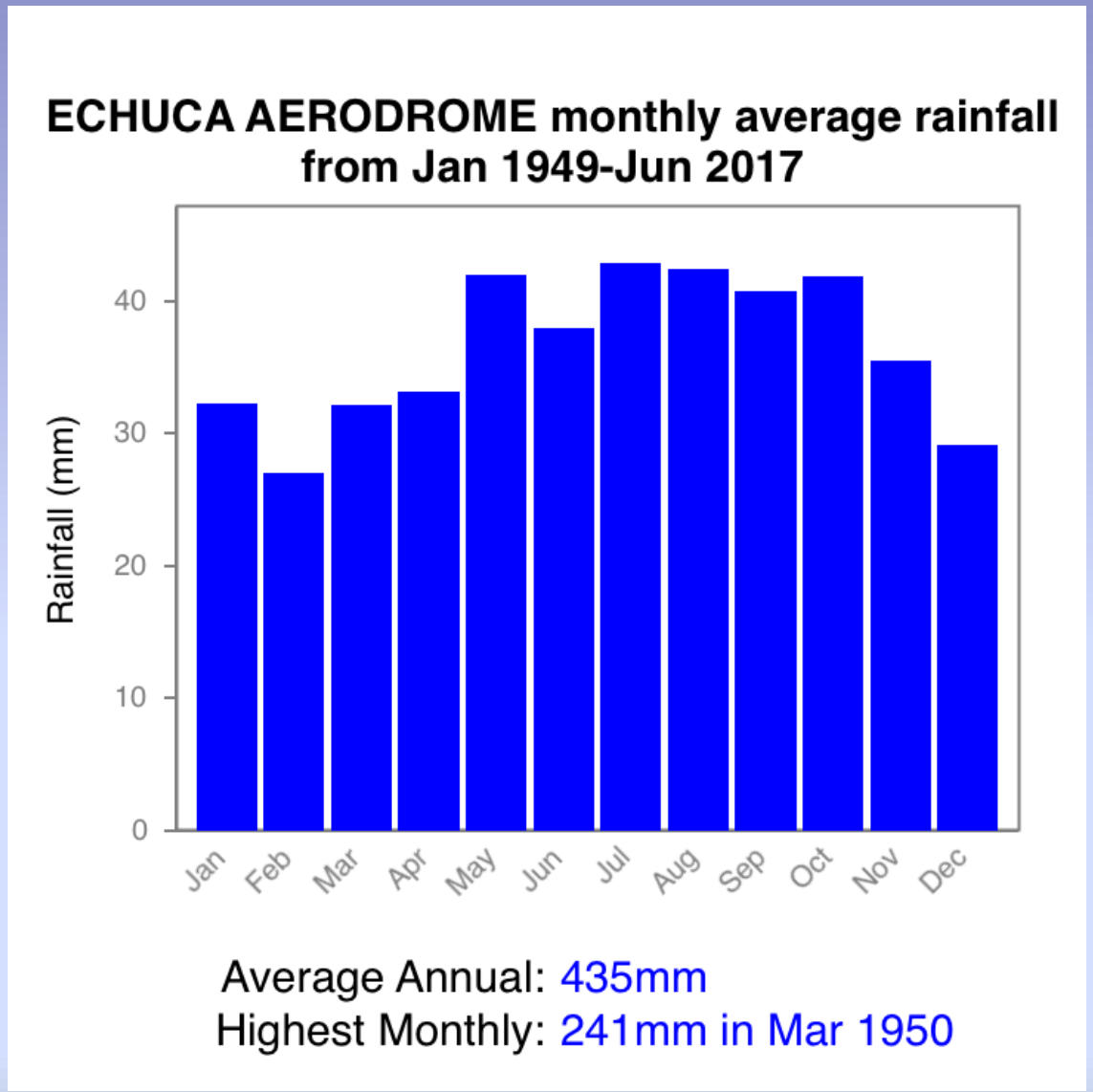
SIMS FARMS

Pine Grove



Rainfall

- **Min 6.75 inches**
- **Max 32. inches**
- **Ave 16 inches**

- **High Evap**
- **Lots of Sunlight**

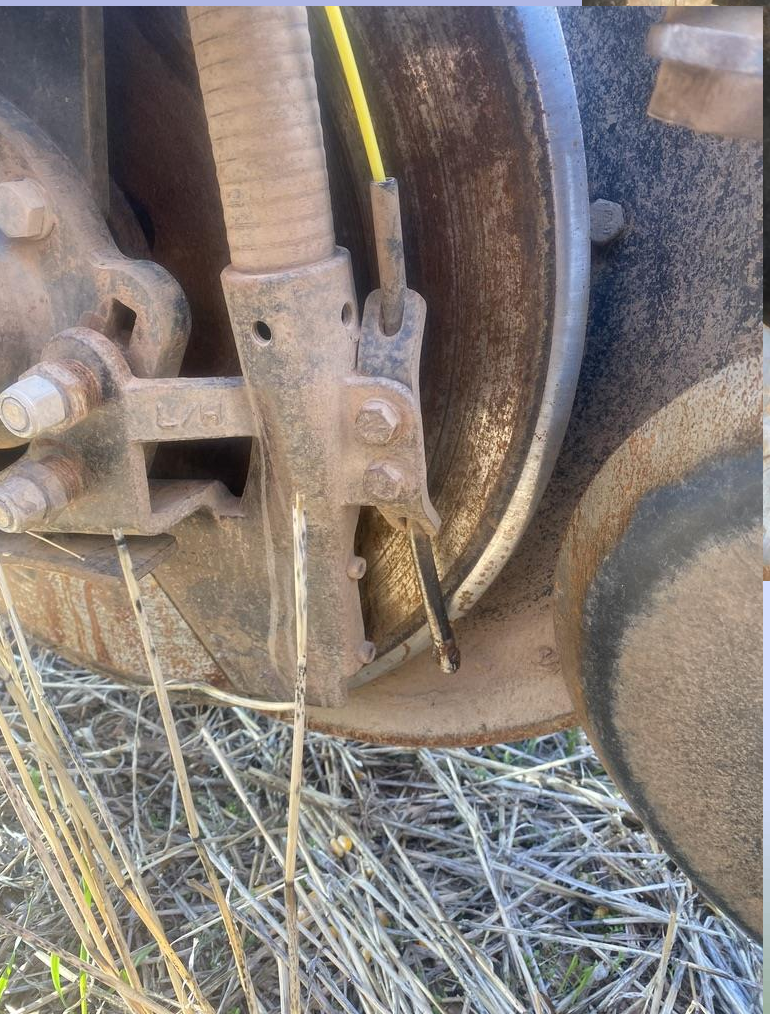
- **8500 acres**

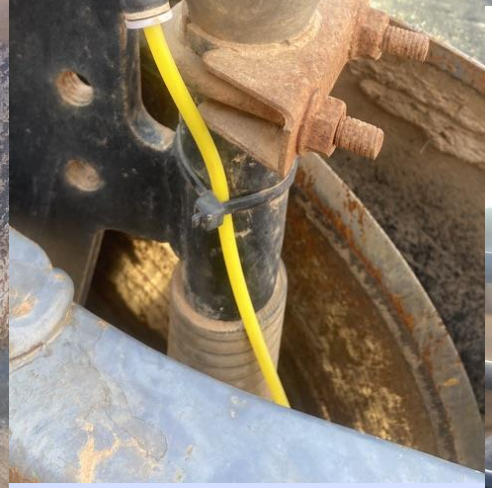
6th Generation Farmer


MF

2008

- No more MAP
- Seed dressings
- Fungicides
- Insecticide
- Focus on rotations and diversity





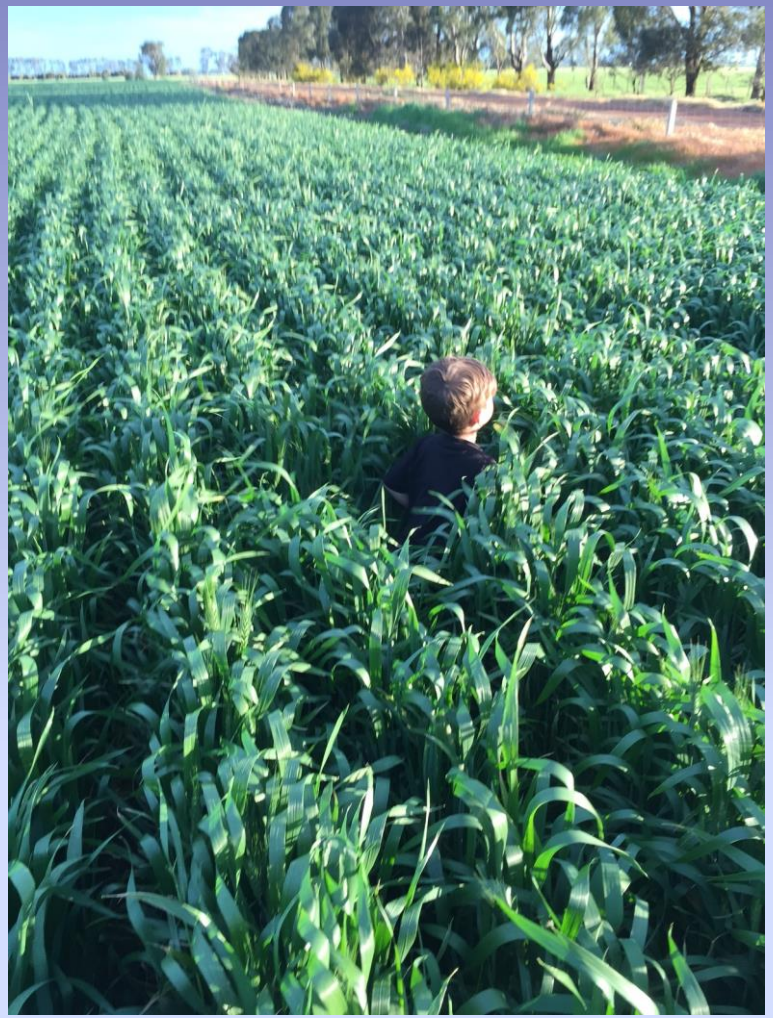

SPRAY

1. Eliminate or minimise tillage
2. Keep the soil covered
3. Maximise Diversity and Rotations
4. Minimise Chemicals and Synthetic inputs
5. Stop Compaction CTF
6. Livestock

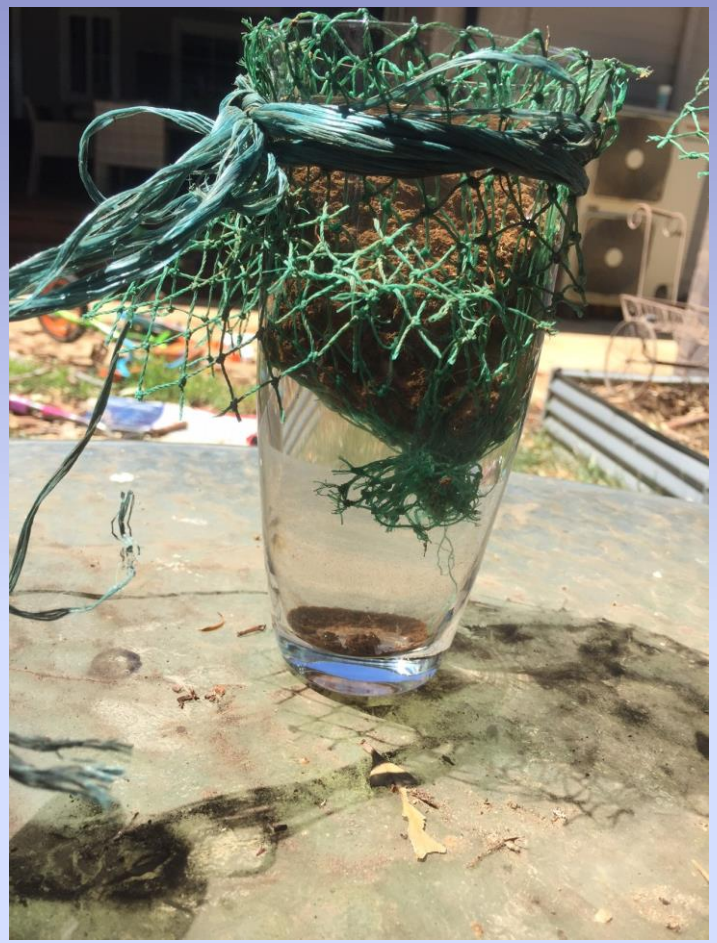

2015 GSR=159mm
4 days at grain fill 40 deg celsius
yield 1.9t/ha ave.
6.25 inches

Synthetic Fertiliser MAP

Biological Liquid Fertiliser



2016 GSR 317mm yield double long term ave. Low inputs
12.48 inches



Zero Till Soil

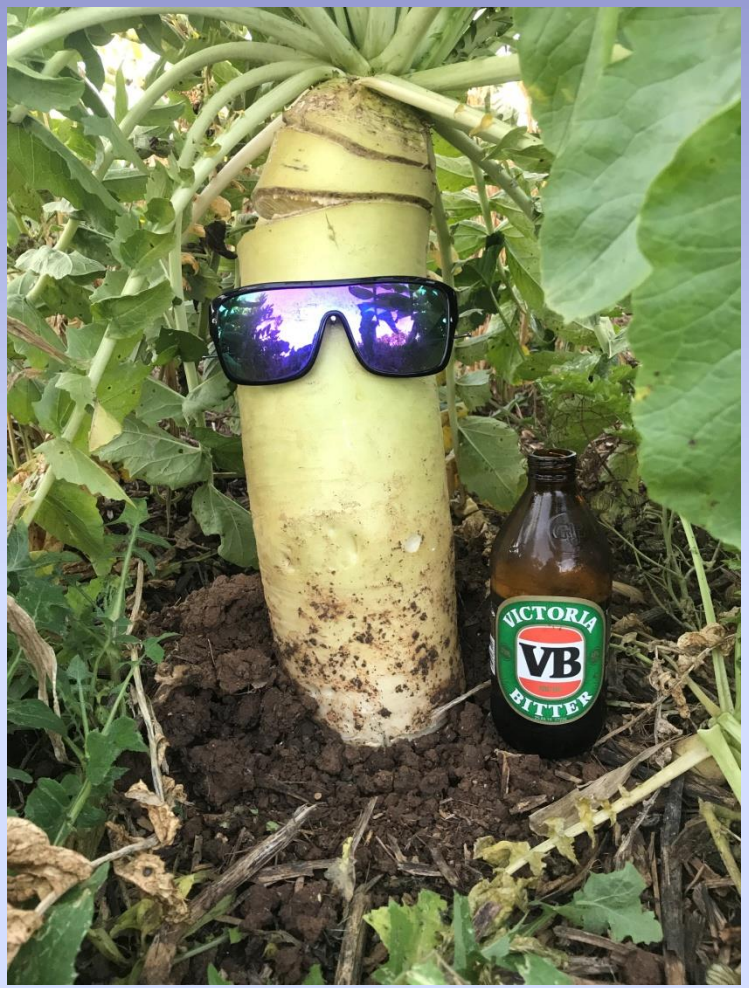
Tilled Soil

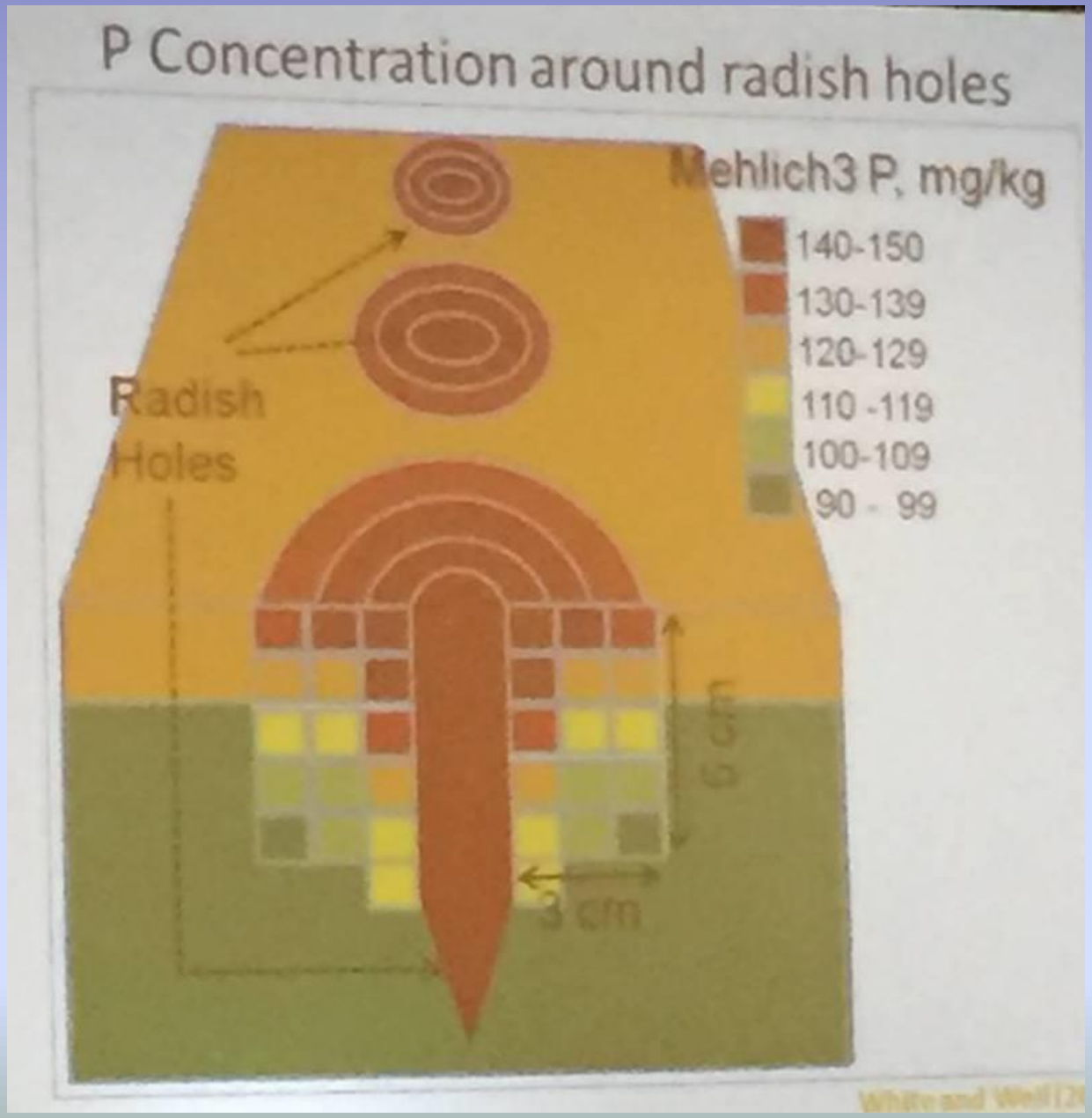
Penetrometer

-detects hardpans
-subsoil moisture content

Compaction

-low aeration,
-poor microbial activity
-mineral imbalances


VICTORIA
VB
BITTER


P Concentration around radish holes
Mehlich3 P, mg/kg
140-150
130-139
120-129
110 -119
100-109
90 - 99
Radish
Holes
6 cm
3 cm


NDF

We always try to aim for 100% soil cover either by stubble residue or living plants

Diversity & Rotations

Wheat, Clover & Radish

- Try to include legumes in every pasture or cereal crop
-legumes like clover tend to feed fungi, N & release root excudates to prize apart the Ca & P bond in soil (2 most important minerals for photosynthesis)
-oats release compounds that inhibit pulse disease etc….

Minimise or eliminate synthetic ferts and chemical inputs that are detrimental to soil biology

- Dissolving Urea
- 7 tonne 28000Lts
- 1:4 ratio 15kgs/60lts
- Single most efficient way to apply N to a plant
- Always combine with humic acid to buffer and magnify. M + M+C
- 10kg of urea can equal 6 x that amount when applied to soil
- Apply any deficient minerals with biology like fish kelp worm etc lifts brix

Fungi Foods

Complex carbons “brown materials”

Stubble

Fish hydrolysate

Humates, Fulvics

Root excudates like clover etc…

Check out

Fungi

-Very important in cycling dead C residues and manures into living C

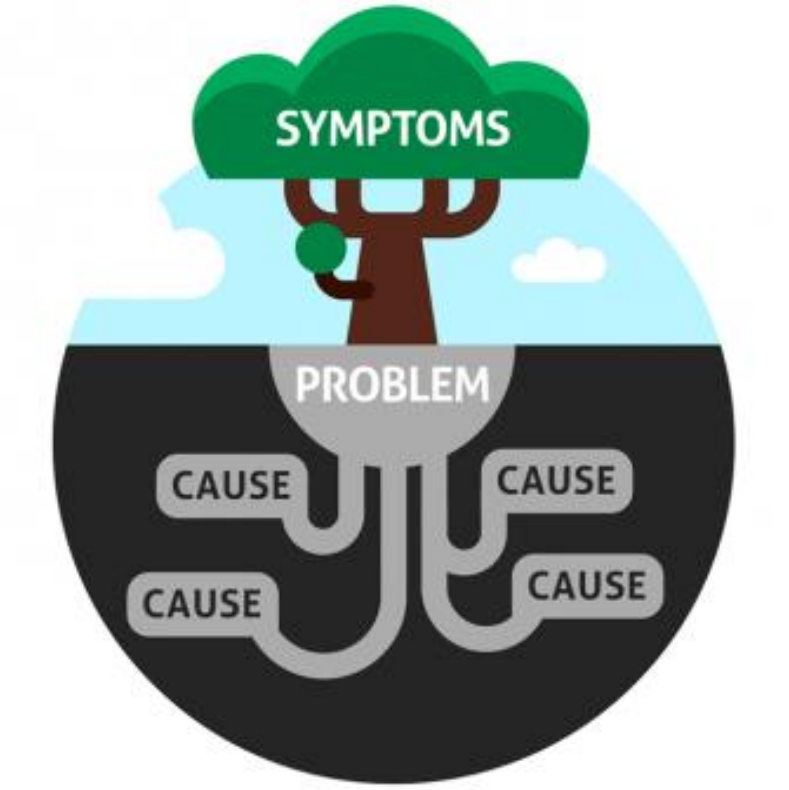
-More important then bacteria in building humus and can also store more C in their bodies

-Literally makes water! When breaking down organic matter 20%of what fungi produces is water

-AMF very important in influencing soil structure and aggregation

-AMF feeds of living roots! In return it helps supply its host plant with water nutrients and protection for pathogens **(disease suppression!)**

-Tillage and fungicide applications and high salt index ferts reduces AMF
and shifts our soils to being more bacterial dominated



Are we treating symptoms or solving problems?

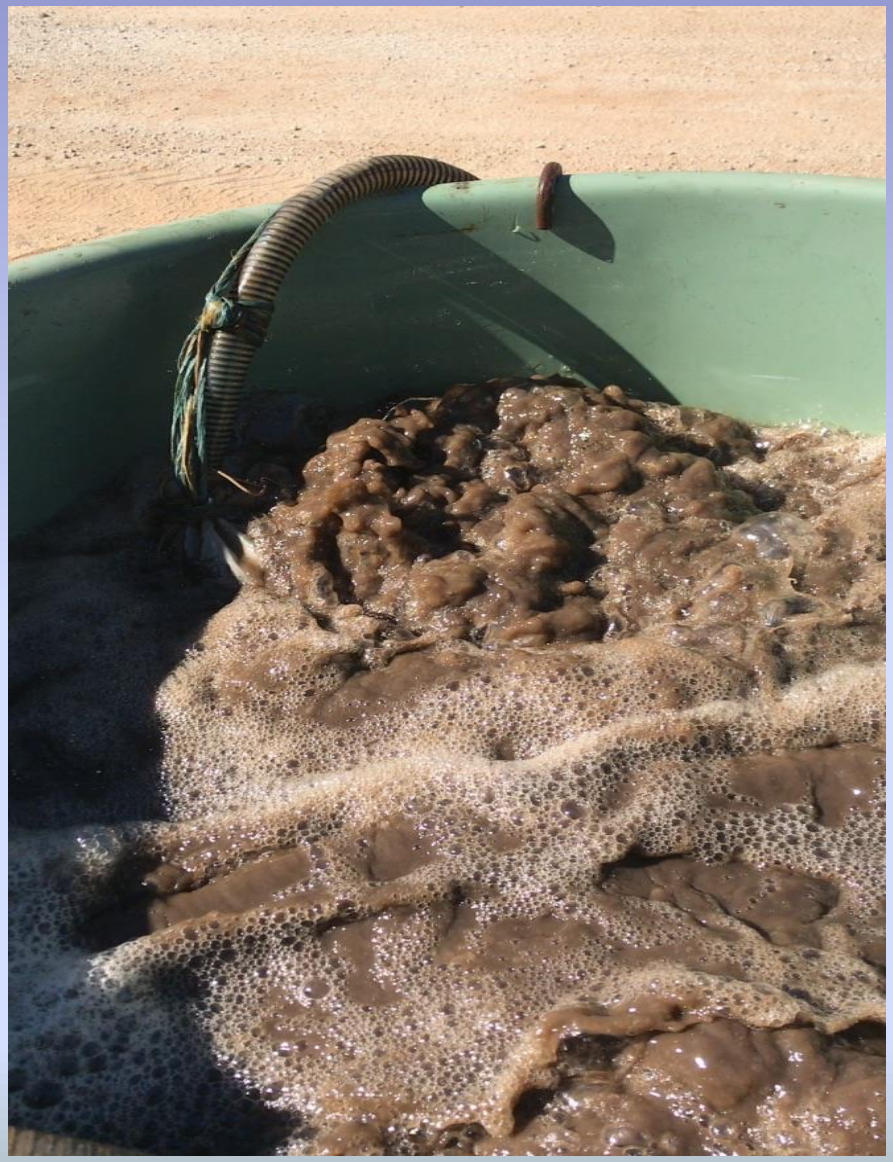
Will we be back here next year doing the same thing?

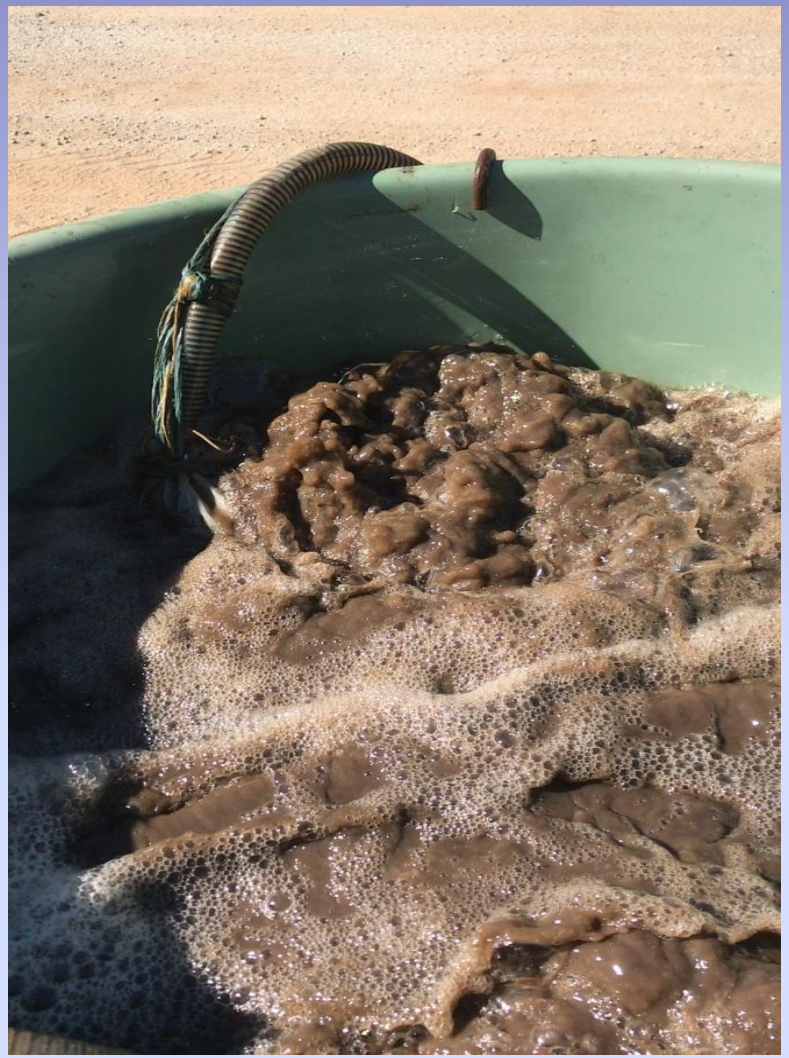
Why are these symptoms appearing

Need to look at all the pieces in the puzzle the bigger picture or “system” to help find a solution to fix the problem

Seed inoculants

-Check out David Johnson bio reactor
-vermicast and extracts
-Zinc and Manganese critical for seed germ “seed energizer”
-kelp
-Trichoderma
-peusdomonas
-bascillis





Foliar spray

Pseudomonas syringae is in rain creating ice neuculating bacteria on the leaf that causes frost damage

Pseudomonas fluorescens (in worm juice) eats p syringae and protect the plant from frost damage as low as -6 deg C for upto 2 mths.

Detoxifies breaks down chemicals

-Insects are the accumulators of N in an ecosystem
-In forests 90% of N comes from dead insects and poop
-The N they add is plant available and non leachable
-Predators of pest insects and weed seeds

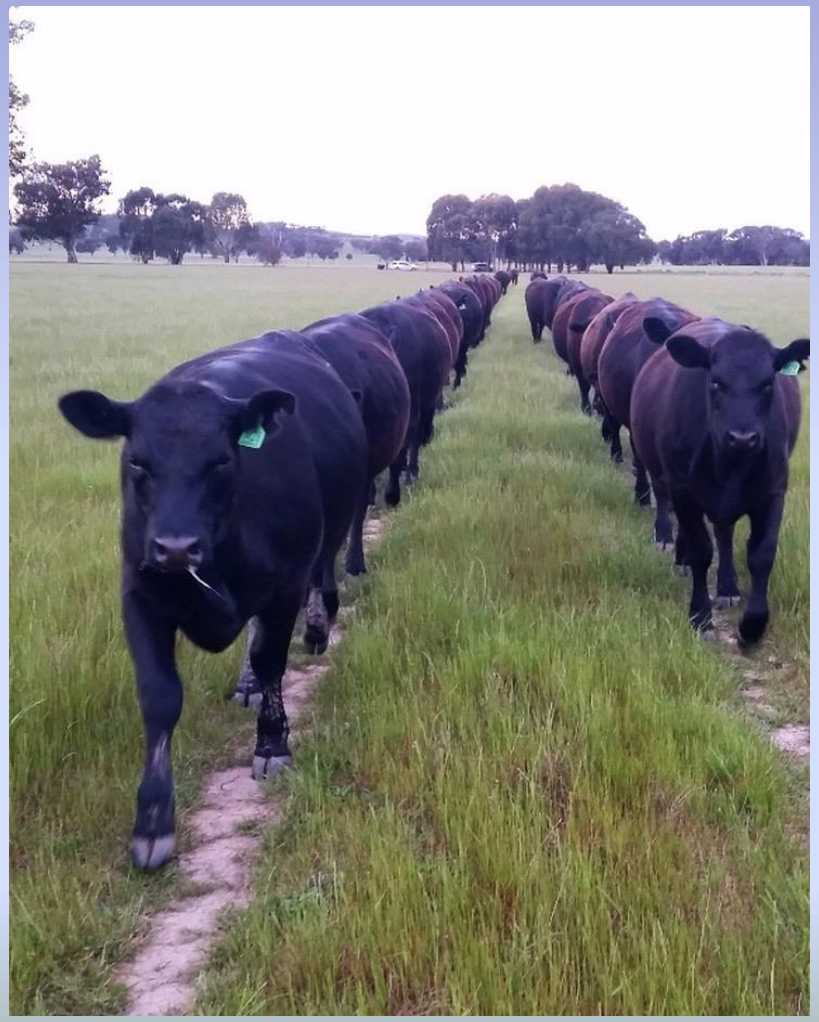
Brix

- Optimal photosynthesis and plant health occur when brix is 12 and over = less pests, disease and weeds.
- 1% lift in brix increases 45g/day weight gain in animals and 100g/milk solids/cow/day
- Reduces impact of frost higher sugars
- High brix = less pest pressure reduces their ability to breed complex sugars and complete protein.

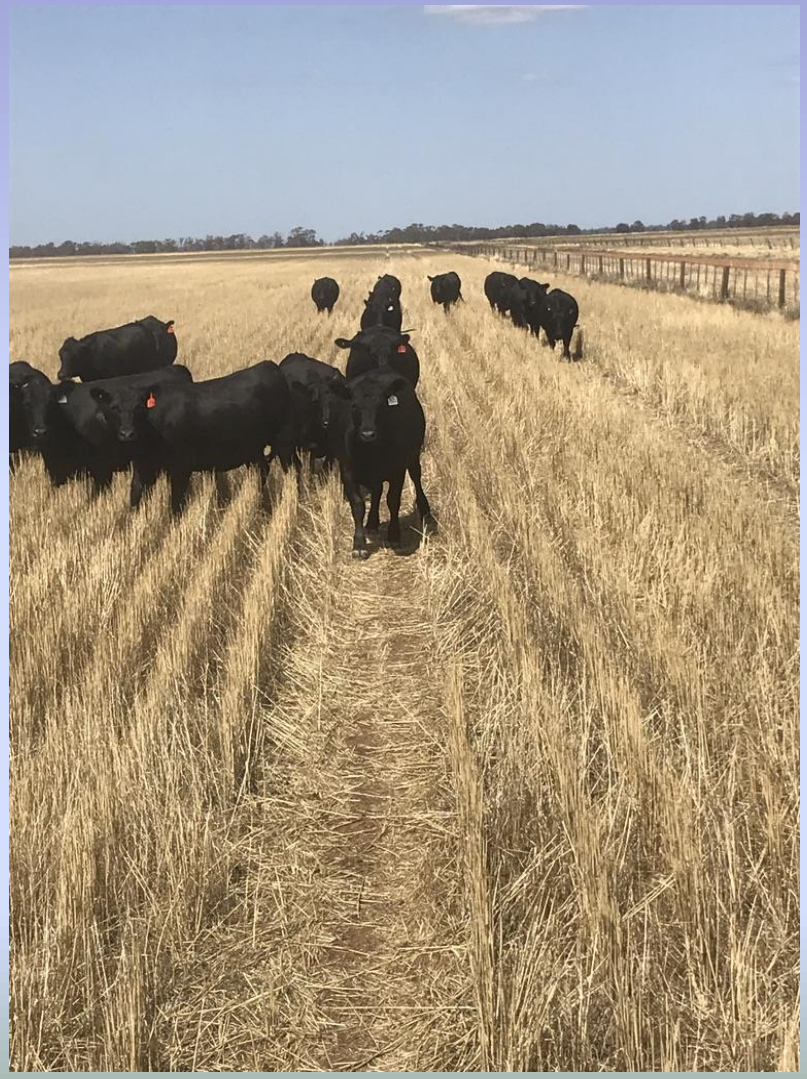

WILD
TURKEY
101
& COLA

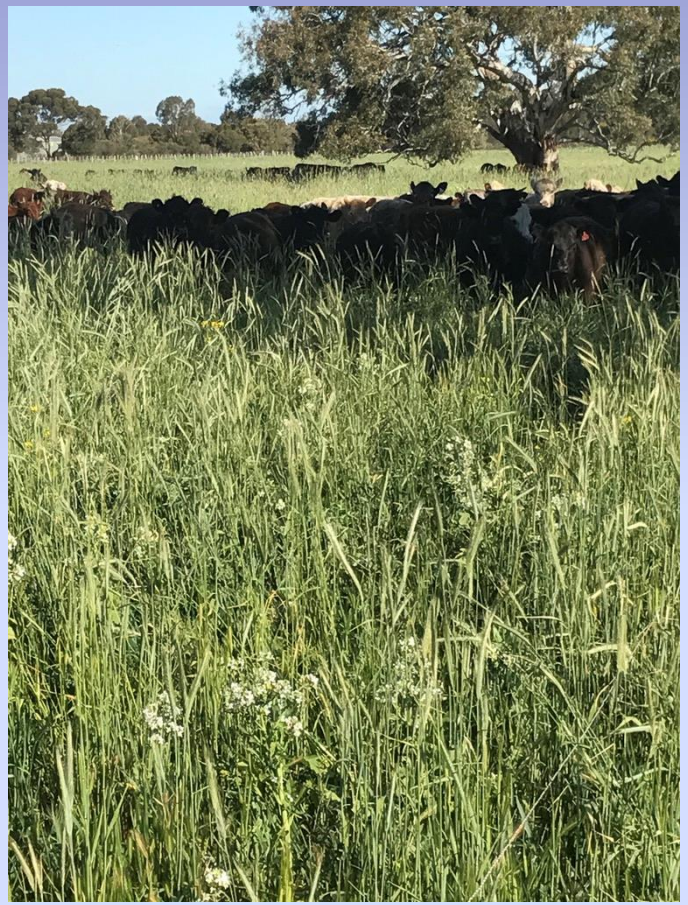
12mt CTF 3-1

CTCF
Control Traffic Cattle Farming



CTCF
Control Traffic Cattle Farming



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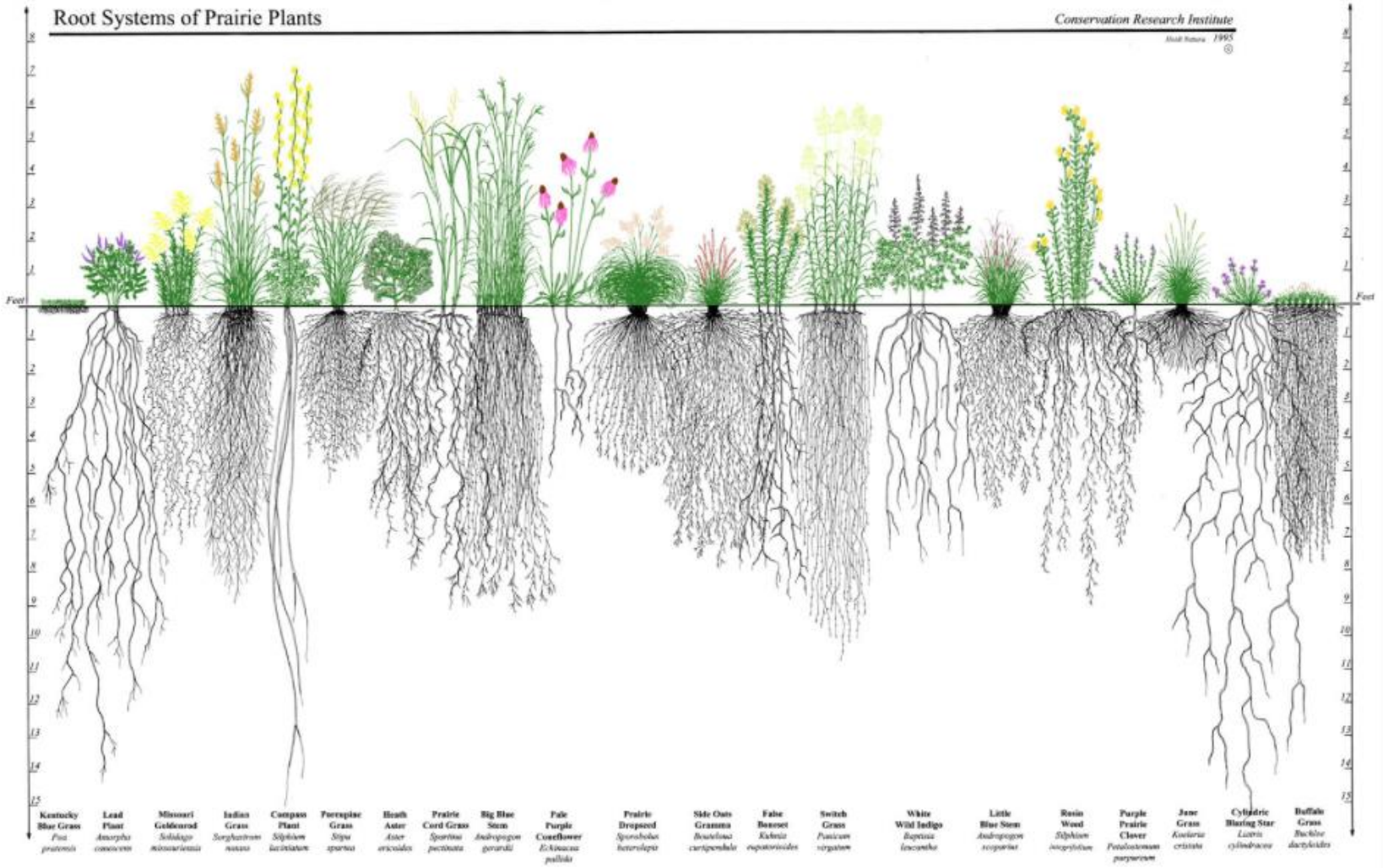

Root Systems of Prairie Plants
Conservation Research Institute
1995
Feet
Kentucky Blue Grass Poa pratensis
Lead Plant Amorpha canescens
Missouri Goldenrod Solidago missouriensis
Indian Grass Sorghastrum nutans
Compass Plant Silphium laciniatum
Porcupine Grass Stipa spartea
Heath Aster Aster ericoides
Prairie Cord Grass Spartina pectinata
Big Blue Stem Andropogon gerardii
Pale Purple Coneflower Echinacea pallida
Prairie Dropseed Sporobolus heterolepis
Side Oats Grama Bouteloua curtipendula
False Boneset Kuhnia eupatorioides
Switch Grass Panicum virgatum
White Wild Indigo Baptisia leucantha
Little Blue Stem Andropogon scoparius
Rosin Weed Silphium integrifolium
Purple Prairie Clover Petalostemum purpureum
June Grass Koeleria cristata
Cylindric Blazing Star Liatris cylindracea
Buffalo Grass Buchloe dactyloides

Plant Families

- Farmers around the world are finding that optimal functional diversity in annual covers,
- forages, cash crops and perennial pastures requires a **minimum of four plant families**
- and preferably six, with only one of these families being the grass family.
- Plant families most commonly used in companion and cover crops
- **Amaryllidaceae** - onions, chives, garlic etc
- **Apiaceae**: more than 3,000 species including carrots, parsnip, coriander, caraway, cumin,
- celeriac, celery, coriander/cilantro, dill, fennel, lovage, angelica, anise, chervil, cicely,
- parsley and so on .... Apiaceae are also great companions for fruit trees, as is asparagus
- (in the **Asparagaceae** family, unsurprisingly!!)
- **Asteraceae**: the daisies - lettuce, sunflowers, safflowers, marigolds, zinnias etc
- **Boraginaceae**: phacelia, borage, comfrey
- **Brassicaceae**: radish, turnip, kale, camelina, mustard, sweet alyssum etc
- **Chenopodioideae**: (a sub-family of Amaranthaceae) all the beets, plus quinoa
- **Cucurbitaceae:** cucumbers, gourds, melons, squashes, zucchinis and pumpkins
- **Fabaceae:** most of the cool and warm-season legumes are in this family - clovers, peas,
- beans, birdsfoot trefoil, vetches, alfalfa, sunn hemp, sanfoin, sulla, fenugreek etc etc
- **Lamiaceae** - mints, basil, sage, thyme
- **Linaceae:** linseed (flax) - widely used in covers and also an excellent non-competitive
- companion in the vegetable garden
- **Malvaceae**: okra
- **Poaceae**: cool-season cereals (eg wheat, oats, barley, rye etc) and warm-season grasses
- (corn, sorghum, millet etc)
- **Polygonaceae**: buckwheat
- In addition to the wide diversity of annual and perennial plants listed above, an increasing
- number of livestock producers are including the following non-leguminous perennial forbs
- in their pastures .....
- **Apiaceae**: sheep's parsley *(Petroselinum sativum)*
- **Rosaceae**: salad burnet [also known as small or sheep's burnet] *(Sanguisorba minor)*
- **Asteraceae:** chicory *(Cichorium intybus)*, yarrow *(Achillea millefolium)*
- **Onagraceae**: evening primrose *(Oenothera glazioviana)*
- **Plantaginaceae**: narrow-leaved plantain *(Plantago lanceolata)*

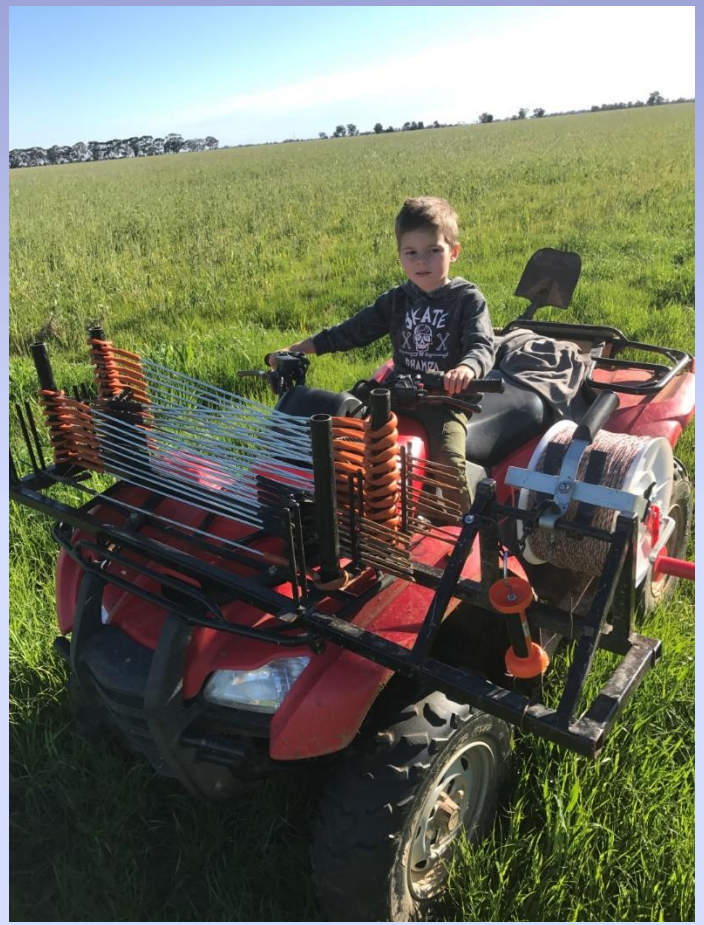
Soil biological succession causes plant succession

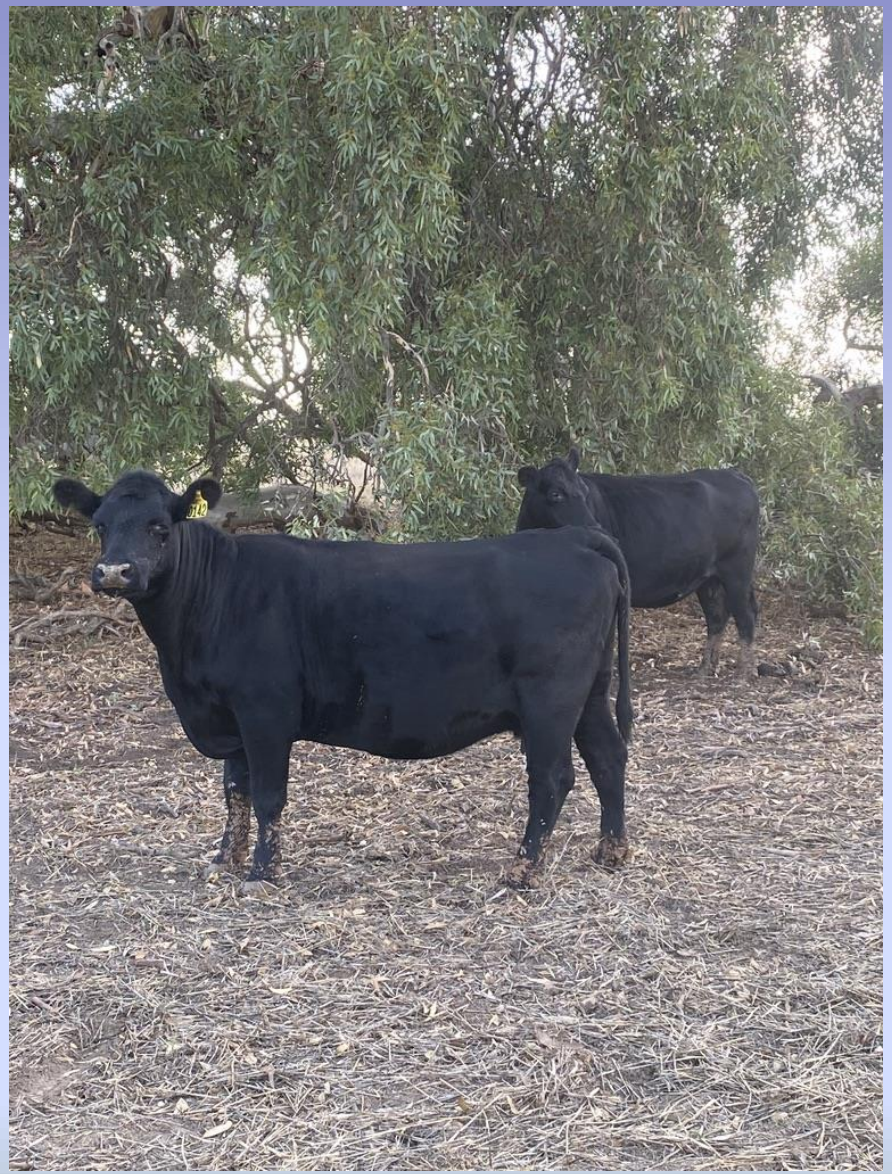
Bacteria …A few Fungi……Balanced ……..More Fungi…… Fungi

Bacteria:	**10 µg**	**100 µg**	**500**	**600 µg**	**500 µg**	**700 µg**
Fungi:	**0 µg**	**10 µg**	**250**	**600 µg**	**800 µg**	**7000 µg**

More Nitrate (type of nitrogen needed) More Ammonium

10% (percent of energy that plant puts below ground) 80%





Thank you!!!

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- Healthy soil
- Healthy plants
- Healthy Kids