Ground cover, soil erosion and nutrient loss

Rob Norton PhD

Norton Consulting Ltd
Faculty of Veterinary & Agricultural Sciences

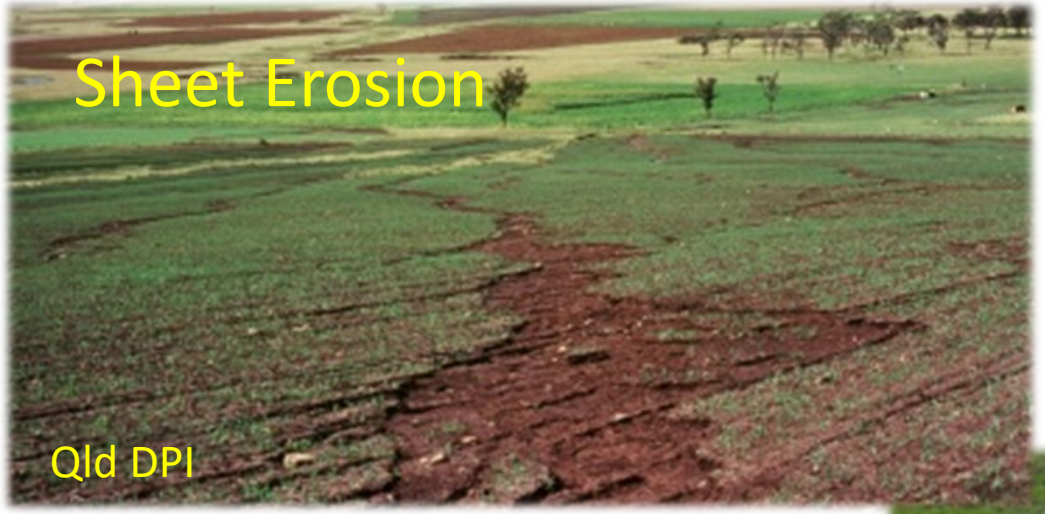
Nutrients in the top 2 cm.

	0-2 cm	8-10 cm	% top 2 cm
Organic Carbon %	1.67	0.78	35%
Colwell P mg/kg	51	15	46%
Colwell K mg/kg	1063	393	40%
Nitrate mg/kg	28	38	16%
Ammonium mg/kg	1.8	1.0	30%

Colwell P (0-10) cm = 24 mg/kg

Data of Ben Jones.

Soil Erosion

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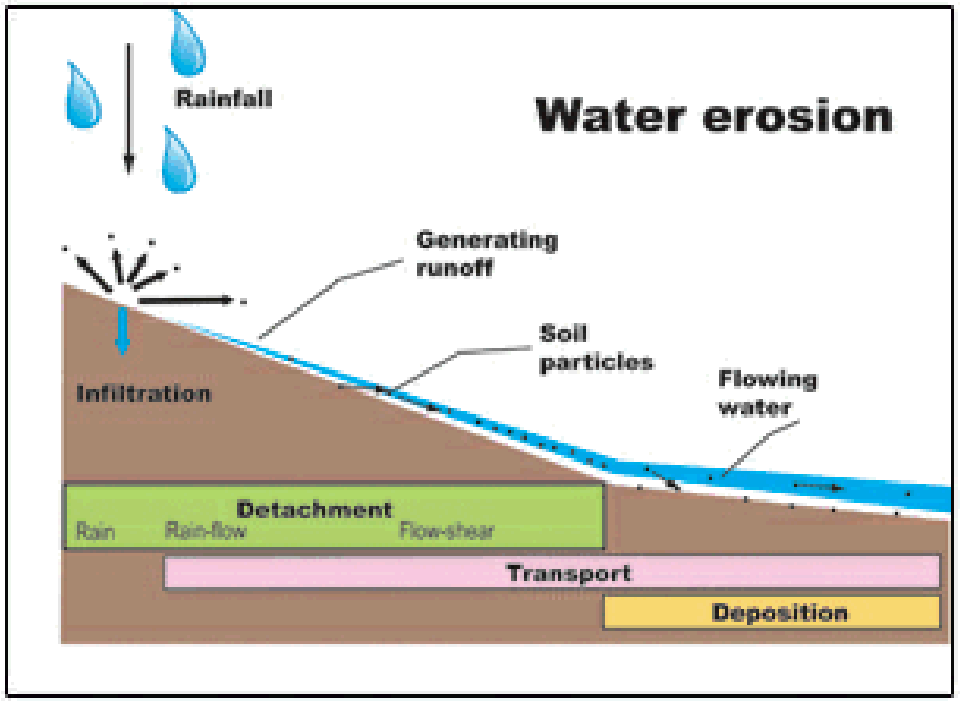
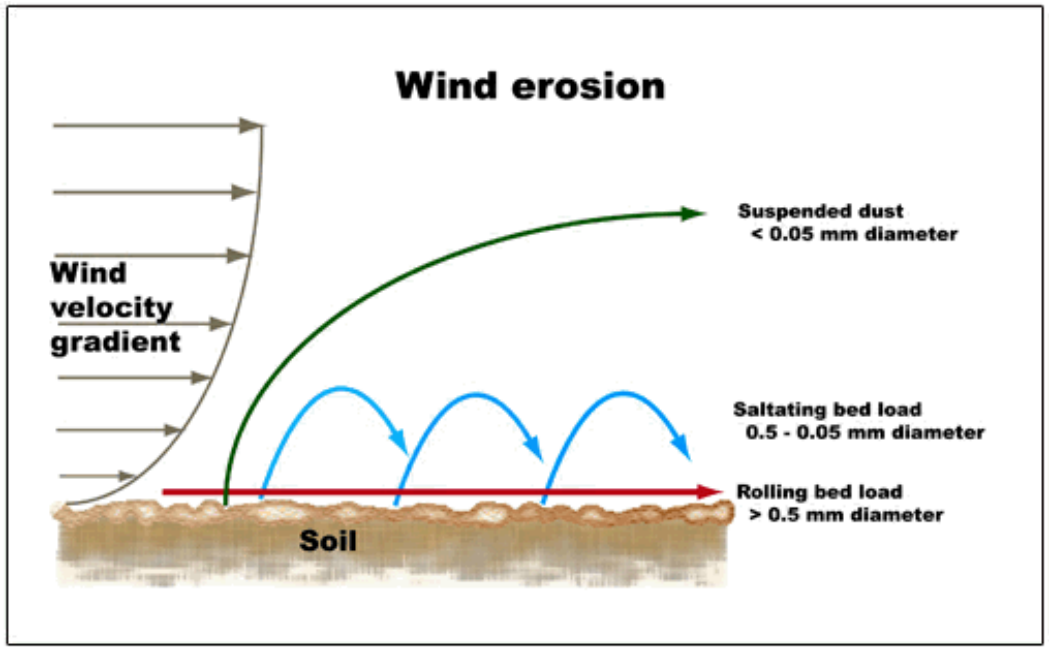
Different agents – common mechanism

- Water or wind moving across a bare soil surface: **PICKUP**



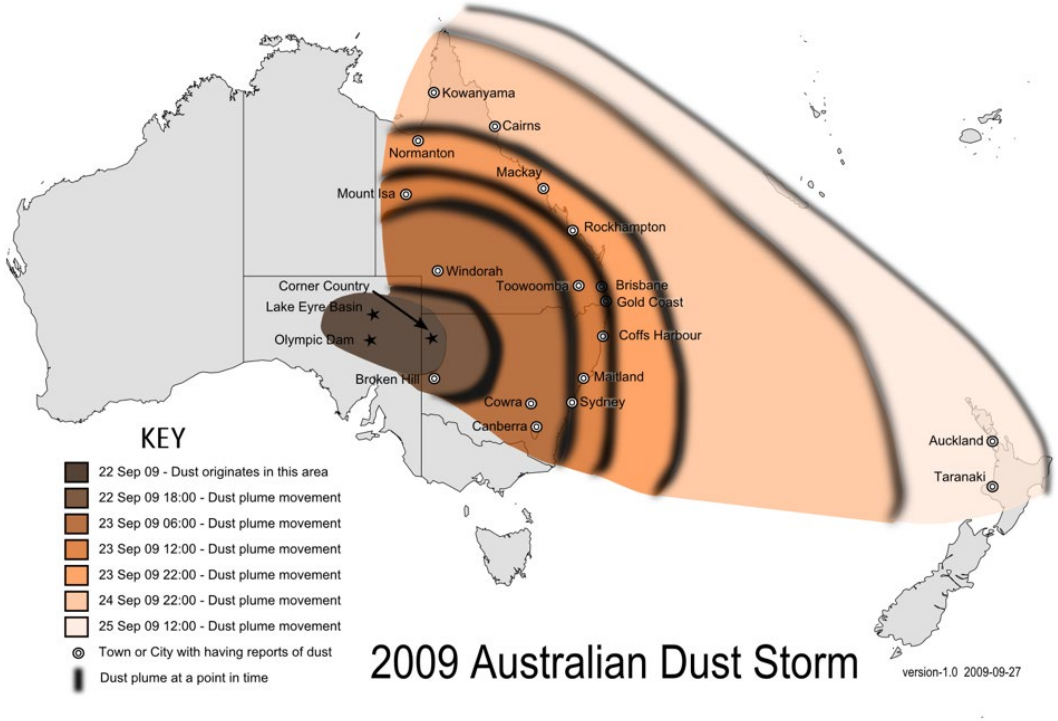


Different agents – common mechanism

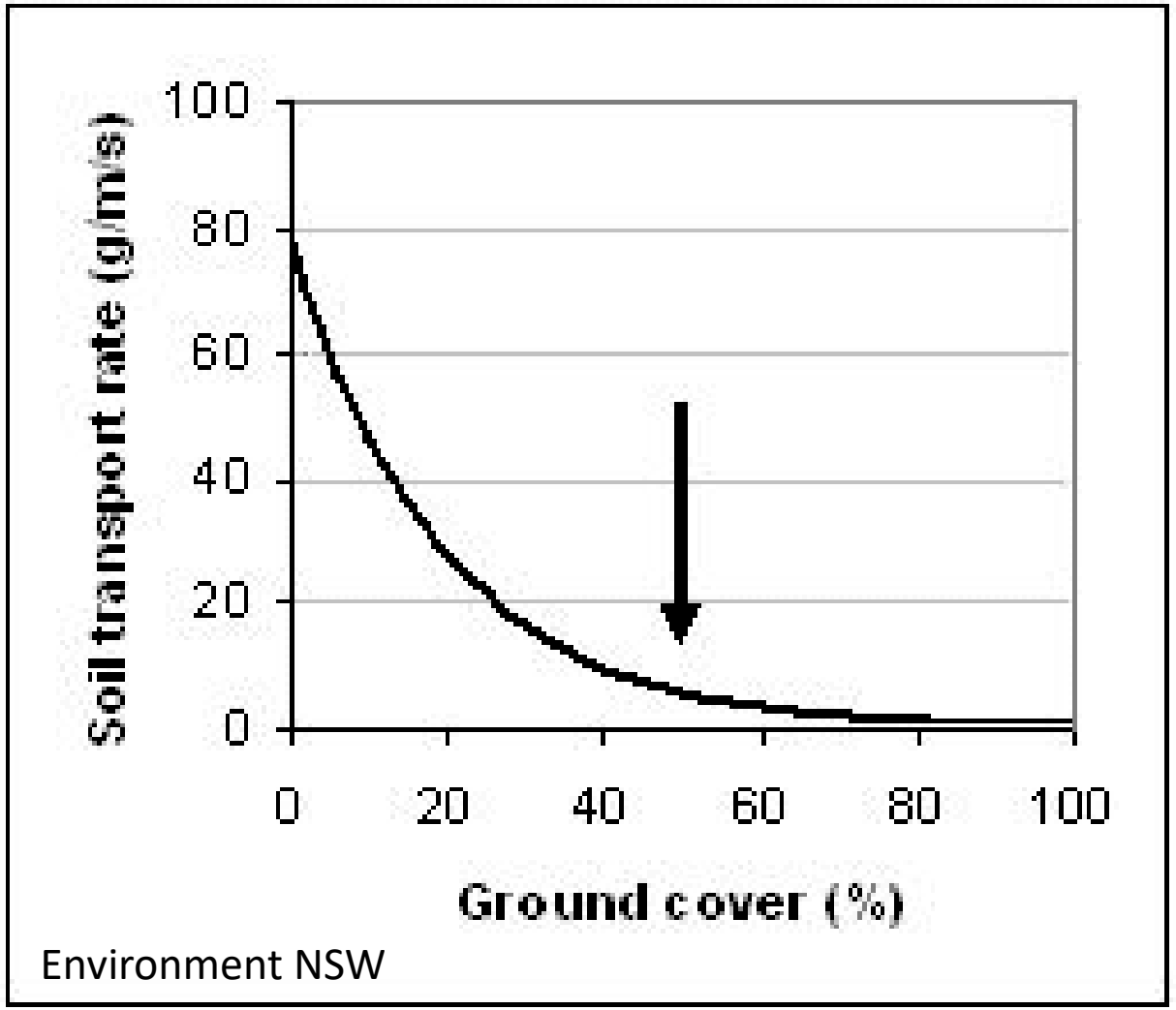
- Water or wind moving across a bare soil surface: **DELIVERY**

Different agents – common mechanism

- Water or wind moving across a bare soil surface: PASSENGERS



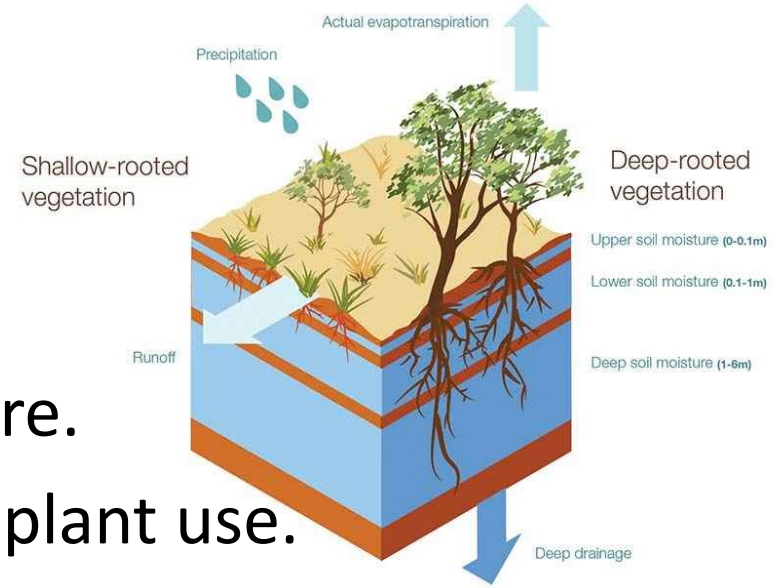
Soil surface protection .....



Environment NSW

- It is essentially bare soils that blow away or flow away.
- Ensure ground cover during times of risk.

Benefits of surface cover



- Reduces raindrop impact - preserving soil structure.
- Improves water infiltration – preserves water for plant use.

Tillage System	Infiltration Rate
Zero Tilled - Wimmera Vertosols	145 mm per hour
Conventionally Tilled - Wimmera Vertosols	12 mm per hour
Zero Tillage PFW rotation – Mallee Sodosol	100 mm per hour
Conventionally Tilled PFW rotation – Mallee Sodosol	44 mm per hour
Source: Bissett & O'Leary, 1996, AJSR 34, 299-308.	

Slaking and dispersion of soils

- Both processes result in the loss of soil structure – particularly at the surface of the soil
- Slaking soils collapse when disturbed
  - Improve the organic matter content of the soil
- Dispersive soils collapsed and leave a “halo” of clay particles.
  - Use gypsum to improve clay stability
- For both – prescribed grazing, residue retention and minimum tillage

Source, USDA

20% stubble cover – 0.4 t/ha

50% stubble cover – 1.0 t/ha

Source, BCG Stubble Project

70% stubble cover – 1.5 t/ha

Rule of thumb:

- Stubble load = 2*grain yield (cereals)

20% ground cover

50% ground cover

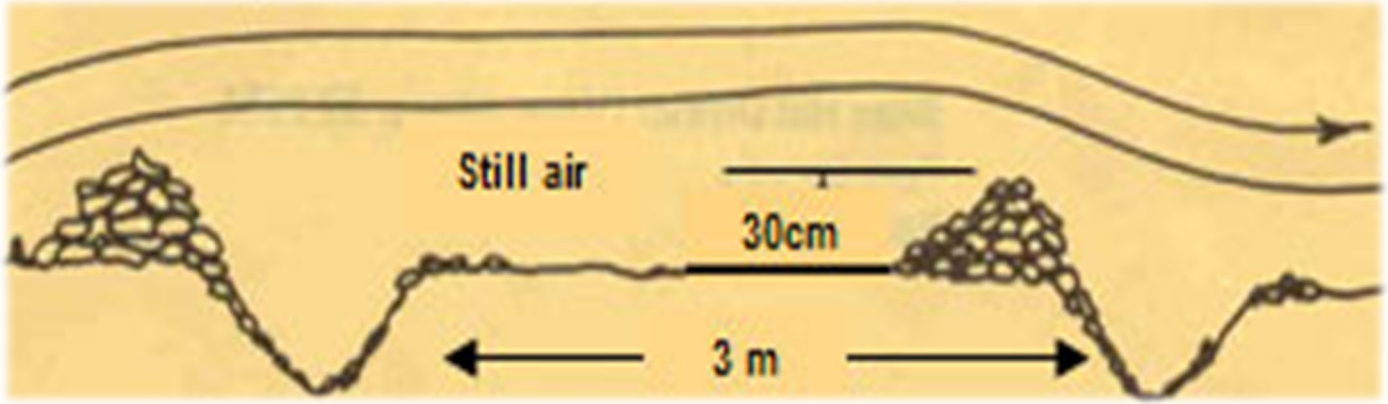
80% ground cover

https://mbfp.mla.com.au/pasture-growth/tool-22-assessing-groundcover/

Options to reduce drift.

- Keep stock off – Stock Containment Areas
  - especially on sandhills.
- Roughen the soil surface.
  - 30 cm ridge = 3 m protection
  - Cloddy material (clays)
  - Across prevailing wind
  - Across the slope
  - Areas drifting

Bring up clods……..



Summary

- Wind and water erosion move good soil into places it is not wanted.
- Maintaining about 30% soil cover is critical to protect topsoil.
- Managing stubble and livestock grazing patterns can help maintain cover.
- Additional interventions may be needed following fires, droughts or on erosion prone landscapes.


Sand Drift in the Mallee 1929
Culture Victoria


GRDC

Wimmera CMA

wcma.vic.gov.au