

The management of trace elements in sheep

Bestwool Bestlamb phone seminar

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Agenda

- What are the key trace element deficiencies
- Understanding risk factors and diagnosis
- Cost effective supplementation

Important interactions

- Intensification of system often induces more severe deficiency
 - Fertiliser
 - Pasture species
 - Pasture growth (dilution)
- Seasonal interactions
 - Winter - spring - summer
- Complicated interaction with other minerals

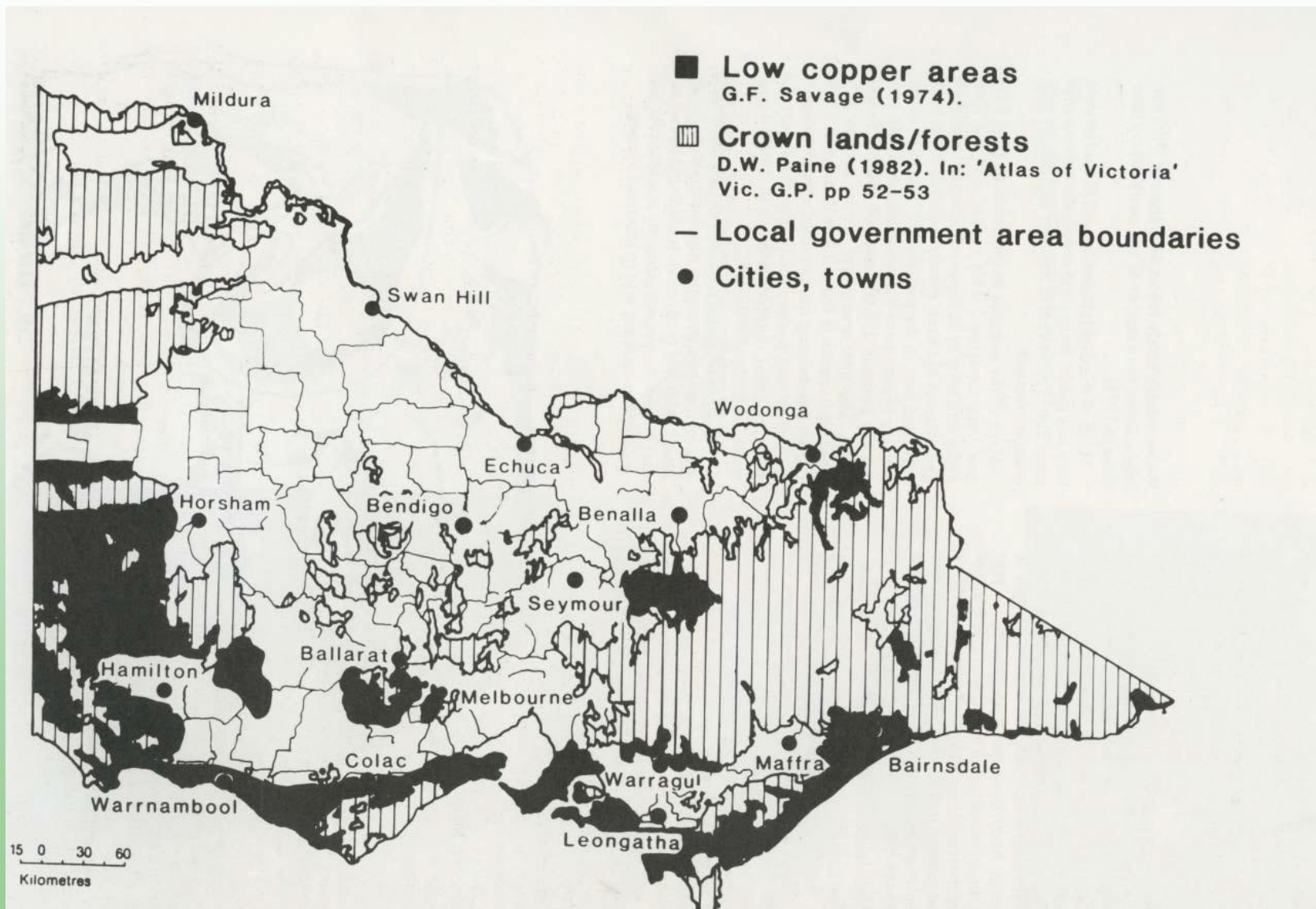
What are the key trace element deficiencies?

- Copper
- Selenium
- Cobalt
- Iodine

Copper deficiency: Where?

- Coastal sandy soils
- Granite soils
- Peat soils
- other soils (interactions)
- High lime application

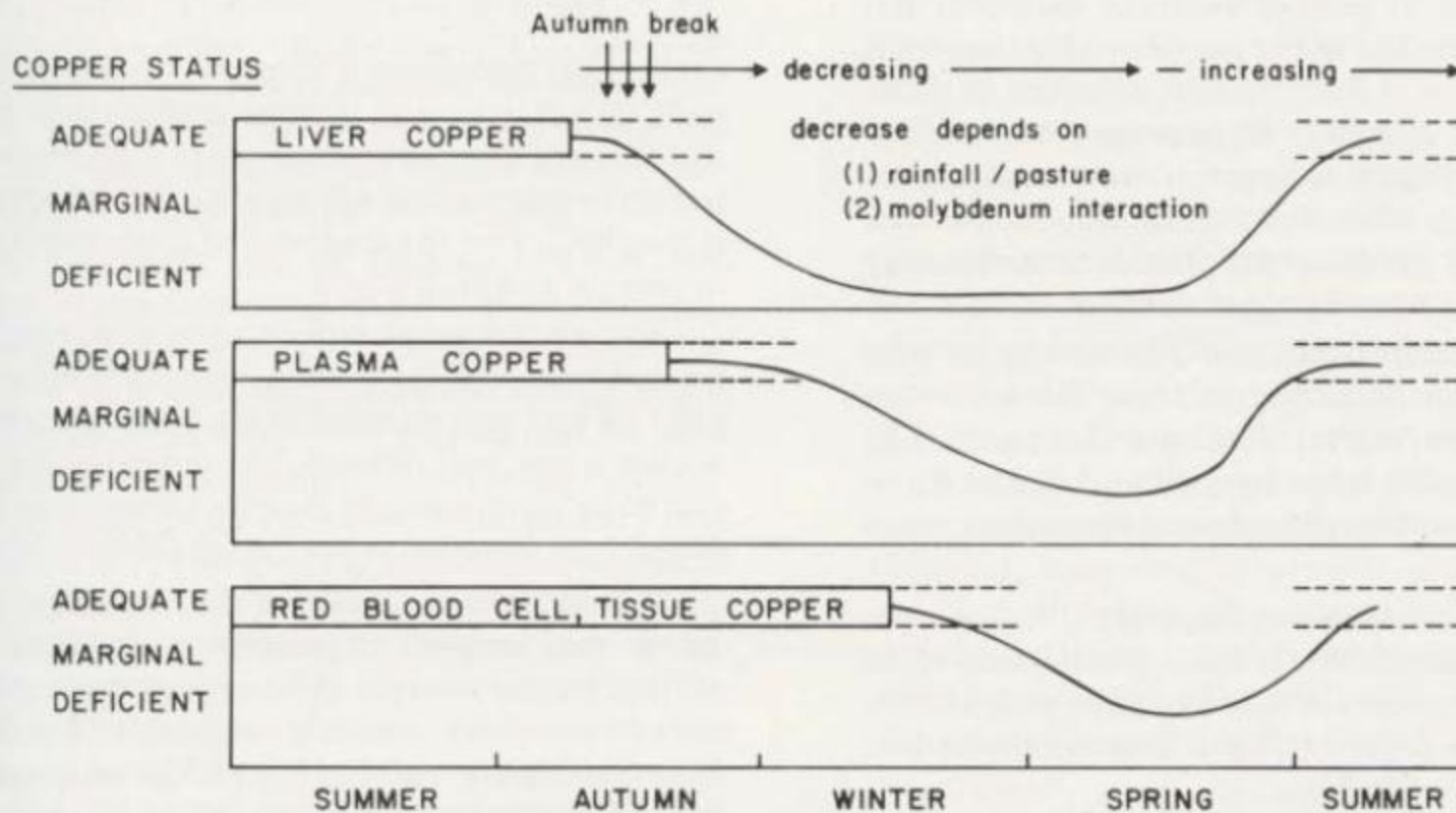
Copper deficiency



Copper deficiency complicated

- Low pasture copper levels
 - Low levels in specific soils
 - Grass < clover
 - Green feed < dry feed
- Complicated interactions
 - Molybdenum (peat swamps, excess Mo applied)
 - Liming pasture makes Mo more available
 - High sulphur

Copper availability



Copper deficiency: Clinical Signs

- wool:
 - Steely wool, loss of pigment in black wool
 - Don't confuse with poor nutrition
- Low Growth (10-15% max more likely cattle high moly May-Oct)
 - Plasma copper must be low >1 month
 - Often Mo > 3 mg/kg DM or Cu:Mo ratio < 2
- Diarrhoea (more cattle)
- Infertility – over rated
- Skeletal abnormalities broken bones
- Enzootic ataxia (swayback) in young lambs



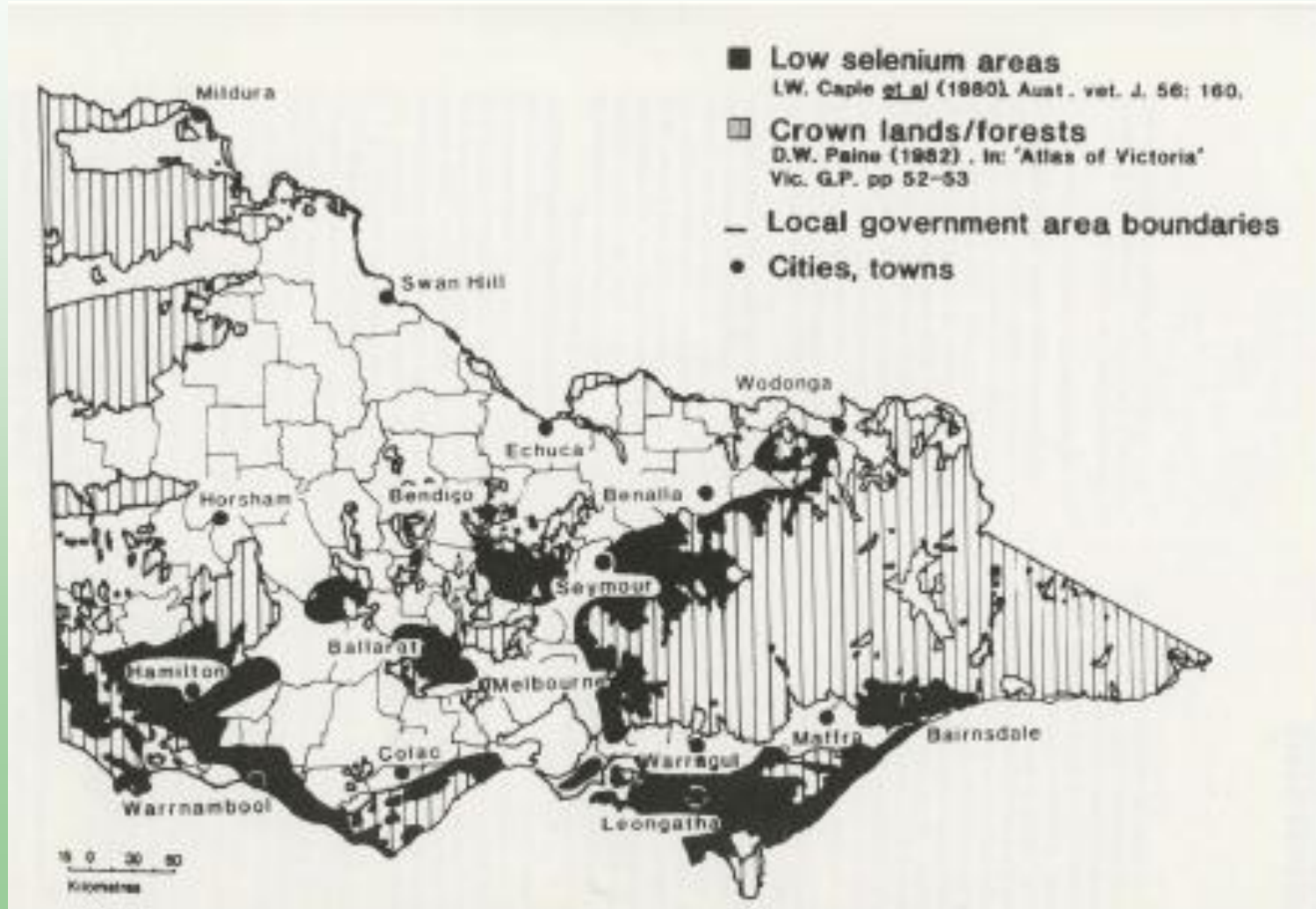
Copper deficiency: Diagnosis

- Blood and liver copper
- Also consider pasture Mo, S & Cu
 - Herbage Cu > 7 mg/kg (stock), 3 mg/kg pasture clover (response trial)
 - For every 4 mg/kg Moly, Cu availability reduces by 50%
- Soil copper: waste of time

Copper supplementation

- Care with too much copper – toxic
 - Especially when on dry feed
 - Sheep previously grazing Paterson's Curse or Heliotrope
- Copper pellets (9-12 months)
- Oral drench copper sulphate
 - 1-2 monthly
 - Weekly where Mo high
- Copper injection
 - Registered for cattle
- Water dispenser (no good in winter!)
- Top dress pastures (up to every 15 years)
 - ~0.5 - 2 kg/ha depends on situation

Selenium deficiency: Where?

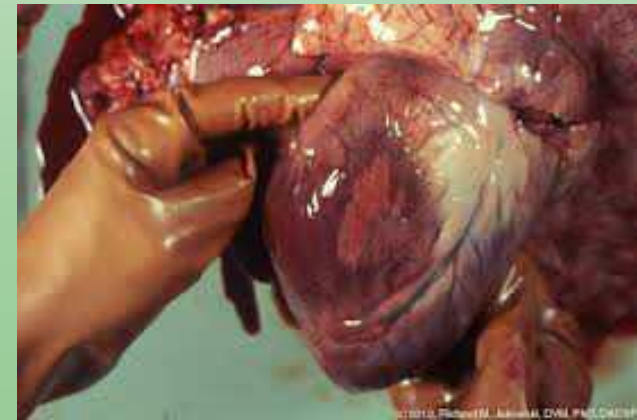


Selenium deficiency complicated

- Low pasture selenium levels
 - Lowest levels in spring & summer
 - Lowest in years of good autumn rain and lush clover growth
- Complicated interactions
 - Lower levels with heavy superphosphate applications
 - Dilution with extra pasture growth
 - High sulphur reduces Se availability
- Sheep very sensitive especially merinos < 12 mnths

Selenium deficiency Clinical Signs

- White muscle disease
 - Lambs (at birth or young lambs under stress)
- Illthrift, poor growth young sheep
 - 10% wool growth response
- Infertility, retained membranes
- Increased susceptibility to disease
- Bigger responses in sheep than cattle



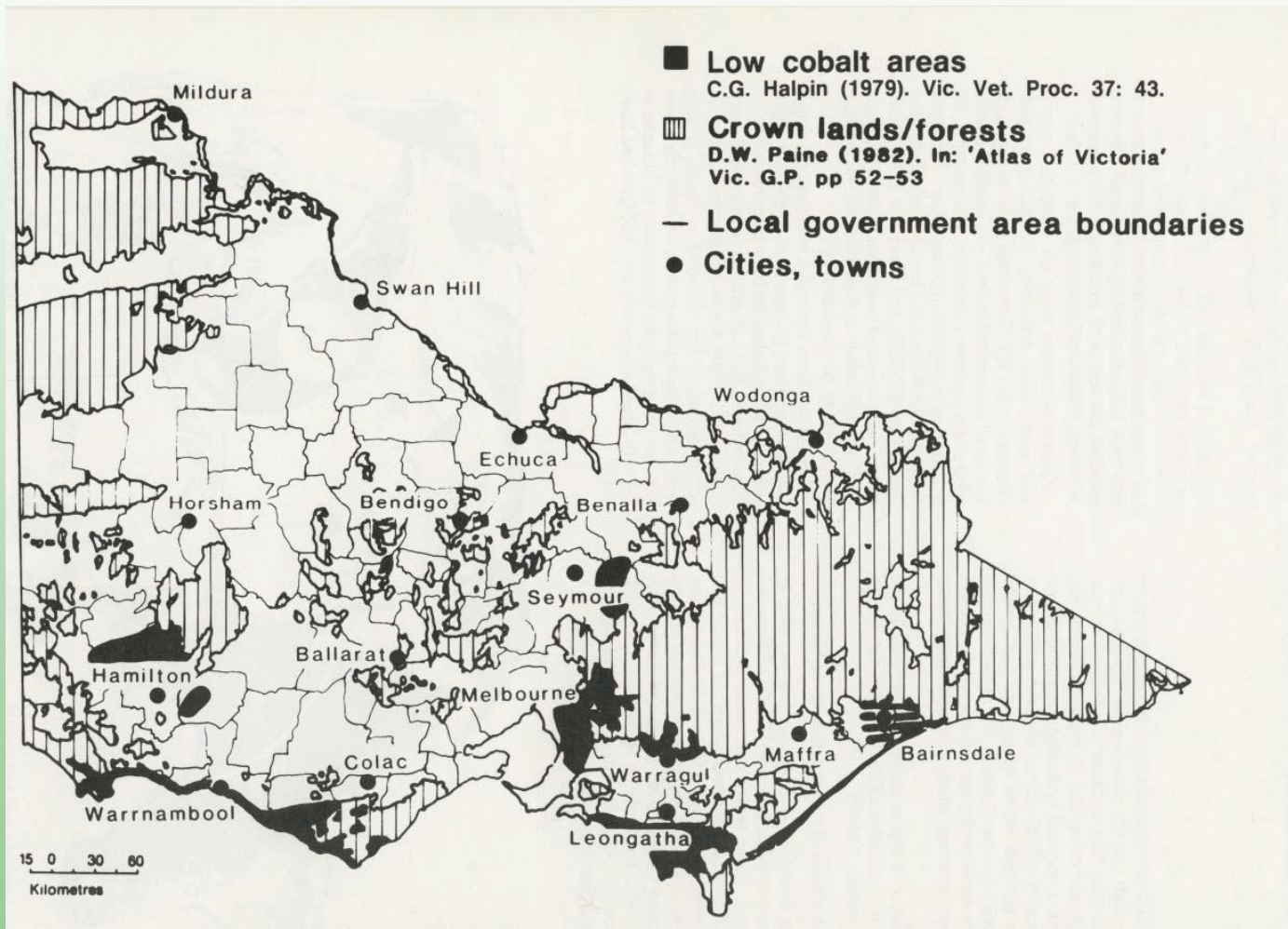
Selenium deficiency: Diagnosis

- Blood and liver Selenium
- Blood Glutathione peroxidase
- Also consider pasture Se
 - Note no plant requirement
- Soil selenium: waste of time

Selenium supplementation

- Selenium pellets
 - 3 years sheep
- Long acting injection
 - Injection Deposel® (availability issue at moment)
 - 2 years protection in sheep
- Selenium in drench for sheep (short acting 6-8 weeks) and shorter acting injections
- Selenium in vaccine (dose enough for lamb at lamb marking)
- Water dispenser
- Selenium in super- Selcote (2 years)

Cobalt deficiency: Where?



Cobalt deficiency

- Cobalt converted to Vitamin B₁₂ in rumen
 - Required in various metabolic pathways including metabolism of propionate (cellulose)
 - Lowest in spring and lush years **“starvation in the midst of plenty”**
- Specific soils
 - Coastal calcareous soils
 - Mountain kraznosems (Co bound)
 - Granite soils
 - Liming and high super application will increase risk of deficiency
- Response does not occur in all years
- Some pasture response (required in nitrogen fixing rhizobia legume nodules)

Cobalt deficiency Clinical Signs

- Poor growth
 - 2-5 kg response in 5 weeks, 0.7 kg wool growth response
- non specific illthrift
- Photosensitization due to Liver damage
- Phalaris staggers Cobalt protective even though cobalt may not be deficient

Cobalt deficiency: Diagnosis

- Blood vitamin B₁₂ levels most common
- Liver vitamin B₁₂, cobalt
- Pasture cobalt levels (<0.1 mg/kg DM)
- Response trial

Cobalt supplementation

- Vitamin B12 injection
 - Up to 3 months
 - In vaccine +/- selenium
- Cobalt pellets
 - 3yrs sheep
- Cobalt oral supplementation/licks short acting
- Water dispenser
- Pasture application (consider pasture requirement too)
 - response variable especially calcareous soils with high Mn

Iodine deficiency

- Lush wet years (>100 mm in 3 months before lambing)
- Goitrogens (white clover brassica crop)
- Goitre
 - More commonly recognised in sheep
 - Spring calving high rainfall years (good autumn break)
 - Diagnosis Thyroid > 0.4 g / kg BW lamb
- Prevention
 - Potassium iodide drench sheep
 - Iodized salt licks



Conclusion

- Substantial economic response to trace element if deficiency present
- No response when not deficient: monitor
- Assess your herds status before spending money
- Intensification can induce more severe deficiencies

Acknowledgement:
Trace elements for pastures and animals in Victoria
www.dpi.vic.gov.au