

## PHALARIS STAGGERS

### Phalaris Staggers Risk

#### Background

Phalaris staggers risk is a function of paddock soil cobalt levels, level of soil ingestion and level of phalaris dominance and palatability. Cases can occur at all times of the year but peaks in late winter. Cattle are less susceptible than sheep but when it occurs it causes larger problems due to staggers in cattle affecting nerves that control swallowing, so effected cattle suffer large weight loss and currently there is no cure. The staggers symptoms can be induced with normal mustering stress up to 2 months after leaving a phalaris paddock.

‘Phalaris staggers’ is a completely separate syndrome to ‘phalaris acute sudden death’. Sudden death syndrome occurs within 36 hours of introduction to phalaris in autumn early winter. The sudden death syndrome is actually an ammonia poisoning. It takes sheep 24 hours to develop effective nitrogen metabolism on phalaris. Vinegar neutralises ammonia but in 2013 the author treated 30 cases with 200 ml of oral vinegar with nil success. Neither cobalt nor Vitamin B12 has any preventive effect on this sudden death syndrome.

To prevent phalaris staggers stock require double the dietary intake of cobalt levels required to maintain adequate sheep vitamin B12 blood levels. Thus cases of phalaris staggers do not necessarily indicate Vitamin B12 deficiency.

#### Assessing risk

##### 1. Animal Cobalt/B12 tests (blood or liver tests)

Vitamin B12 blood levels are not reliable in predicting phalaris staggers, as staggers can occur with normal B12 levels, (B12 blood tests in cattle not even reliable in determining B12 deficiency in cattle *per com I Judson* and also results of double blind tests with split duplicate samples I sent to 4 labs in 2003 including one from NZ which showed no correlation between and within labs)

Liver test unreliable, as I am not aware of any information available correlating liver cobalt with level of risk.

##### 2. Mapping Underlying Parent Rock of Paddock Soil

On phalaris dominant pastures during autumn and winter ingested soil is main source of cobalt. The parent rock is the major determinant of soil cobalt levels, ranking parent rock from highest to lowest cobalt risk is as follows:

- i. Limestone has the highest risk for low cobalt hence the high risk of phalaris staggers in the South east of South Australia. This also might explain why high pH soils are regarded as higher risk for low Cobalt
- ii. Sandstone next highest
- iii. Granite intermediate risk
- iv. Basalt low risk

Alluvial soils risk varies with what rock type soil it was washed away from and conglomerates vary depending on proportion of rock types they are made up of.

### 3. Soil Cobalt Tests

Conducting soil tests not recommended, as there is no calibrated standards or reliable method for measuring soil cobalt available in the published literature. This is not to say with further trials/research this could be a useful method.

### 4. Plant Tissue Tests

Phalaris has very low uptake of cobalt from all soils and thus tissue tests of phalaris will not assist in predicting those paddocks that are at risk. Legumes have much higher levels of cobalt and hence risk of staggers diminishes when proportion of legumes in pasture increases.

### Summary of Assessing Phalaris Risk

Revolves around

- individual paddock history of previous staggers cases
- Palatable phalaris dominant pastures with low legume content
- Likely level of soil ingestion
- Assessing underlying parent rock for each paddock will assist in prioritising at risk areas

### Prevention of Phalaris Staggers

#### 1. Cobalt Foliar Spraying of Phalaris Pasture

##### a) Background

According to Jock McFarlane, (an agronomist at Struan Naracoorte Dept of Prim Industry SA) spraying soon after autumn break once annually has proven to be effective at preventing phalaris staggers in the South East of S.A. (a region where phalaris staggers has a high incidence). Jock McFarlane, in an unpublished trial, found that cobalt deficient sheep grazing pasture treated with cobalt foliar sprays had their vitamin B12 blood levels restored to well above normal levels for a few months. Also a client with a large property west of Naracoorte tells me that the only year they have had phalaris staggers was the year manager forgot to apply the cobalt spray and they suffered 20% losses from staggers in a mob mature first cross ewes.

##### b) Application Recommendations (ref J. McFarlane pers com June 2002)

- 32 gram per Ac of Cobalt Sulphate mixed in water is applied to a quarter of the paddock
- Most use misters due to convenience but he could see no disadvantage with a boom spray
- Require significant green leaves to absorb the foliar spray. May need to wait a few weeks post autumn break for phalaris to shoot.
- Rain within 2- 3 days of application will wash the Cobalt spray off before it can be fully absorbed. So carefully time your spraying.
- Can introduce sheep to paddock as soon as completed spraying.

##### c) Cost of Cobalt Foliar Sprays

In 2011 cost around \$30 per kg (*not including GST*) minimum size bag 25kg = \$825. Chemical cost of around 75c per Ha.

With cobalt only spraying a quarter of the paddock and low toxicity means drift not a problem so tractor could travel at a fast rate heading for the quarter of the paddock that was easiest to traverse over.

Contractor rates \$12 – 17 per Ha but only spraying ¼ of paddock = \$3-4 /ha,

**Total spraying costs of around \$ 4-5 per Ha.**

## Cobalt Bullets

### a) Background

Over fifty years ago CSIRO demonstrated that administration to sheep of two oral cobalt slow release bullets would prevent onset of phalaris staggers for three years. Chris Bourke NSW Dept of Ag Phalaris toxicity expert prefers use of two cobalt capsules per head. Only have to treat sheep once every 3 years (cattle every year) and where have significant phalaris staggers cobalt levels are then at least marginal so bullets ensure sheep are treated all year round for cobalt deficiency rather than only when grazing pasture that has been sprayed in previous few months.

Properties in Hamilton district with only occasional phalaris staggers problems one cobalt bullet has been effective at preventing phalaris staggers. In 2012 one property in Melville Forrest district had substantial phalaris staggers in a mob that had been given a single bullet only 2 years earlier. So whilst one bullet appears to be enough 2 bullets is safer particularly in the 3<sup>rd</sup> year.

### b) Cost of Cobalt Bullets

Cobalt bullets are around \$1 per head, and administration and mustering would cost around 20 c per head for 3 years protection: single bullet = \$1.20 per head, two bullets \$2.20

If running around 10 sheep per ha = \$3-4 per Ha per year single bullet (\$5-7 double bullet)

## Vitamin B12 Injection

- cheap at 8c per dose
- gives an immediate boost to animal B12 levels lasting 6 – 12 weeks
- **it does not prevent or have any beneficial treatment effect on phalaris staggers or phalaris sudden death**

## Clinical Signs & diagnosis

- Takes a minimum of 10 days grazing of phalaris for staggers symptoms to occur with most cases taking 1-3 months of grazing. Symptoms can arise up to 2 months after moved of phalaris.
- Symptoms usually but not always persist for life. The more rapid the onset of symptoms the better the chance of recovery.
- Characteristic symptoms of head nodding and bunny hopping base wide gait. (*I have a video that demonstrates symptoms to look for*)
- Post mortem characteristic pigmentation in the brain seen on microscopic exam at pathology lab that can often also be seen grossly at post mortem.
- Cases between 18 months and 5 years likely to be eligible for TSE (Mad Cow) surveillance subsidy. This provides \$50 to farmer and covers post mortem costs.

## Summary of Phalaris Staggers Preventative Strategies

- Cobalt foliar sprays and cobalt bullets are both effective at preventing phalaris staggers.
- Cobalt foliar sprays easier to apply than cobalt bullets and you still retain full management flexibility with which stock you can select to graze on the at risk productive phalaris pastures.
- **There is no effective treatment for affected sheep. Sheep with advanced symptoms must be promptly euthanased.**

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