

## Perennial Grasses – Potential Grazing Issues

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Perennial grasses provide a good feed source in most situations but occasionally livestock problems may occur. The likelihood of this depends on which pasture species is being grazed, and when and how it is being grazed. Weather conditions, for example summer rain, may also influence toxin concentrations in these plants. These problems can often be avoided by providing pasture diversity and preventing stock from grazing the same pasture species for long periods of time. Note which perennial grasses you are planting, especially when seed mixes are used, and be aware of the possible problems that may arise with those species.

### Rhodes grass (*Chloris gayana*)

Rhodes grass is widely grown and grazed in Queensland where it is regarded as an excellent pasture species. There have been no reported problems in livestock grazing this grass. Some *Chloris* species have been reported as presenting a risk to stock by way of cyanide poisoning due to cyanogenic glycosides present in the plant, but Rhodes grass is not one of these.

### Panic (*Panicum* spp.)

Many of the *Panicum* species contain steroidal saponins. These compounds can cause photosensitisation (dermatitis caused by chemicals in the bloodstream reacting with light at the skin surface) in ruminants.

Photosensitisation is most often associated with the grazing of stressed plants. This may occur in late spring and summer when good rain is followed by a period of hot conditions. Young animals are most susceptible, so short and hard grazing periods with adult animals may help to avoid this problem.

The species of Panic known to cause problems include:

- *P. coloratum* (Bambatsi Panic, coolah grass);
- *P. maximum* (Green Panic, guinea grass);
- *P. gilvum* (= *schinzii* = *laevifolium*), (sweet grass);
- *P. dichotomiflorum* (smooth witch grass);
- *P. virgatum*;
- *P. miliaceum* (French millet).

Green Panic also contains oxalates and has caused big head in horses (see *Setaria* below).

Green Panic and Bambatsi Panic are commonly used in seed mixes in Western Australia.

Steroidal saponins in the plant result in secondary photosensitisation. In **secondary photosensitisation** toxins act to directly damage the liver. The damaged liver is then unable to metabolise phylloerythrin, a breakdown product of chlorophyll in the green feed. This results in increased levels of phylloerythrin, a photoactive compound, circulating in the blood. Where the blood comes close to the surface of the skin the compound is activated by the light and causes tissue damage. The liver damage can be present as a chronic problem and future grazing can result in the same problem quickly recurring. Photosensitisation results initially in swelling under the skin, which then sloughs leaving raw sores. Areas like the ears and face are the worst affected because they are covered only by short wool that provides less protection from the light. The backline can also be affected.



Figure 1. Photosensitisation on the muzzle and eyelids of a ewe

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## **Setaria (*Setaria sphacelata*)**

Setaria contains oxalates and has caused acute oxalate poisoning in ruminants and horses, but it is most often associated with a condition called '**big head**' **in horses**. This occurs when horses graze pasture grasses with more than 0.5 per cent total oxalate dry matter, and a calcium:total oxalate ratio of less than 0.5. In this situation the oxalate binds with the calcium to form insoluble calcium oxalate, making the calcium unavailable for absorption. This results in increased activity of the parathyroid gland which produces more parathyroid hormone (secondary hyperparathyroidism). This hormone in turn increases the resorption of calcium from the bones and abnormal tissue replaces this bone material, producing what is called osteodystrophia fibrosa. This often causes swelling of bones in the head due to the abnormal tissue, thus the name big head in horses. Alternatively this problem can lead to poor growth and lameness. This condition does not occur in ruminants because their rumen microbes break down some of the calcium oxalate, releasing calcium for absorption.

Hyperparathyroidism can be avoided or its risks reduced by providing mineral licks.

Setaria has also been reported to produce death in lactating cattle on young growth.

Purple pigeon grass (*Setaria incrassata*) is also capable of causing big head in horses but this plant is not a recommended pasture species for Western Australia.

### **Grazing management**

Setaria will contain high oxalate levels especially if fertilised with nitrogen. The oxalate levels also vary in different cultivars and younger plants, which are high in nitrogen and therefore high in oxalate.

## **Signal grass (*Brachiaria decumbens*)**

Signal grass contains steroidal saponins that cause photosensitisation in ruminants and oxalates that cause big head in horses.

## **Kikuyu (*Pennisetum clandestinum*)**

Kikuyu grass is a safe and useful pasture in most situations but, in certain circumstances, it can cause acute and severe rumenitis and death in cattle or sheep. This has been reported in New Zealand, Queensland, New South Wales and Western Australia. In most cases the outbreaks have followed the introduction of livestock to paddocks that had been spelled for a period and which had become quite lush or rank. It can also occur in pasture that receives good summer rain after being fertilised, and is growing vigorously.

The clinical signs from Kikuyu poisoning in ruminants include abdominal pain, depression, incoordination, aimless wandering, recumbency and eventually death. Animals are often found drooling and situated near water, looking as if they are drinking but not swallowing any water. Affected animals may recover if removed from the Kikuyu pasture when clinical signs are first seen.

### **Grazing management**

Avoid grazing lush paddocks that may have been locked up for periods of time, especially if there has been a summer rain event.

Kikuyu grass may also contain oxalates and is capable of causing big head in horses.

## **Buffel grass (*Cenchrus ciliaris*)**

Buffel grass is not recommended in the agricultural region, as it is not as productive or as palatable as some of the other grasses. (it may also have some weed issues).

Buffel grass contains oxalates and is capable of causing acute oxalate poisoning in ruminants and big head in horses. The acute poisoning is more often reported in young or hungry sheep.

### **Grazing management**

Avoid grazing Buffel grass if there is lush growth following good rains the previous summer. Young animals should also avoid grazing pure stands for long periods.

## **Premier digit grass (*Digitaria eriantha* spp. *eriantha*), Puccinellia and Tall wheat grass (*Thinopyrum ponticum*)**

There is no information on these plants being toxic.

## **Para grass (*Brachiaria mutica* or *Brachiaria muticum* or *Panicum muticum* or *Urochloa mutica*)**

This grass contains oxalates and may cause big head in horses; it may also contain cyanogenic glycosides and cause cyanide toxicity.

## **Lucerne**

Lucerne is usually a good feed source for cattle and sheep, but very occasionally can be associated with problems.

Photosensitisation can occur periodically as it does with a number of other legumes. It is unsure whether lucerne causes **primary photosensitisation** (due to a photoactive agent in the plant being absorbed) or a secondary photosensitisation (resulting from a damaged liver that is unable to metabolise phylloerythrin).

Lucerne may also cause infertility. Lucerne contains variable amounts of coumestans that are phyto-oestrogens and which can suppress oestrus and inhibit ovulation.

A condition called '**red gut**' may also sporadically occur in sheep grazing lucerne. This results in the small intestine becoming inflamed and possibly twisted. Affected animals usually die. There have been two recorded cases in Western Australia, involving only a small number of sheep in the flock each time. The condition was reasonably common in New South Wales and New Zealand, but better management has reduced the number of cases.

## Seed mixes

Some of the major seed resellers in Western Australia are marketing mixes of perennial grass seeds. The mixes contain varieties of Rhodes grass (*Chloris gayana*), Panic grass (*Panicum* spp.), Signal grass (*Brachiaria decumbens*) and Setaria. The Setaria is made up of the varieties Splenda and Solander, which provide equal risk to horses as most other Setaria varieties.

At first glance it may be assumed that such mixes will have the potential to produce photosensitisation in ruminants, big head in horses, acute oxalate toxicity in ruminants, and possibly nitrate toxicity, when they are grazed. However, all the problems described above that may be associated with these plants usually only result when a single species is the major pasture component available. Using a mix dilutes any risk, and the presence of Rhodes grass in the mix adds a further safety factor. Nevertheless, the pasture should be monitored to ensure that no single species becomes dominant over time.