Equestrian Issue 33 2013

Talking Horses

The newsletter with news, views and practical advice

From the editor...

Our past 4 issues discussing pastures have been very popular with readers and this final issue completes the series. If you have missed any of the issues E29-E32, please email Gary at **newsletters@kohnkesown.com** to request back copies.

We are overwhelmed by how many horse owners file our newsletters as handy reference material on a variety of topics. Although new information is available on the internet by browsing search engines such as Google, often the practical information for Australian conditions is difficult to find or doesn't exist online.

In this issue, we include information on toxic pasture plants and a round-up of oxalate-containing tropical grasses for those with C4 grasses in their pasture.

I take this opportunity to wish you all a safe and relaxing festive season and I look forward to writing E34 early next year.

Best wishes,

Dr John Kohnke BVSc. RDA

In this issue...

Handy Hint 1

Mow Weeds before they Seed

It is important to mow pasture to control weeds before the weed plants develop a flower head or mature seed. Potentially toxic weeds, such as those from the Senecio genus eg, fireweed and cotton fireweed (*Senecio spp*) and Paterson's curse or salvation Jane (*Echium plantagineum*), can cause acute or chronic liver damage in horses, as well as flatweed or catsear (*Hyperchaeris radicata*) (the cause of Australian Stringhalt) develop multiple flower heads and quickly mature to seed. Mowing and slashing pasture with visible flowers of these species can spread large amounts of the small seeds throughout the pasture. It is estimated that a single mature cotton fireweed plant (*Senecio quadridentatus*) with 10 flower heads can produce 200-300 seeds. It is a perennial weed and with suitable climatic conditions, it can quickly overrun large areas of pasture. The small seeds of these weed species are also blown in the wind or travel in water after a wet rainy period on grazed down pasture, invading neighbouring pasture areas. Even if you control the invasion of weeds on your horse property, a poorly managed property within 1 km can be a source of continued reinfestation.

Plan a regular mowing schedule to help eradicate fireweed and flatweed by mowing to 75mm in height before flower heads are visible. In optimum winter and spring growing conditions, this may require mowing every 2 weeks to prevent seed head formation. Check the pasture by walking around to identify weeds which are about to flower. Even a delay in mowing to control these weeds by 3-5 days due to wet weather can result in less than effective management of weed growth. Paterson's curse is much more difficult to control by mowing alone, as it has a toxic rosette stage which is below mowing height. In small invasions, such as in areas spread where hay with mature dried plants and seed heads has been fed out, spot spraying in the rosette stage with a targeted herbicide is the most effective way to control and eradicate this perennial, persistent weed.

Did you know...

Overgrazing and drought conditions are the main causes of weed and poisonous plant invasion into a grazing pasture. Many horse owners often have too many horses on a small area, particularly in the urban fringe of 2-4 hectares (5-10 acres) subdivisions around cities and towns.

Studies have shown that to provide grazing pasture all year around a stocking rate of 1 x 500kg average horse per ¾ of a hectare (around 2 acres) is sustainable. A spring flush may produce more pasture on 4 acres (leaving at least 1 acre on a standard 2 hectare property for a house, surrounding garden, stables, yard and working arena) than 2-3 horses can handle, but cold, wet winter or dry summer conditions may reduce this stocking rate down to 1 horse per 4 acres to minimise the risk of overgrazing, even with hard feed and hay to maintain a horse in reasonable condition. Leaving horses out 24/7 on pasture will eventually destroy most of the palatable pasture species, simply because horses have an innate desire to graze, exercise and socialise and will eat palatable pasture out, leaving unpalatable weeds.

If you have more horses than the carrying capacity, it is essential to limit access to grazing to a few hours each day and confine horses to a yard or stable on hard feed and hay. Once a pasture is grazed down to less than 150 mm (6 inches) in height, it becomes stressed and cannot regrow as quickly, allowing weeds, which may be better adapted to the soil or seasonal conditions, to become established. A rotational grazing program by shifting horses regularly onto new rested pasture once plants are eaten down to 75-100mm (3-4 inches), can help increase overall pasture production by 50% throughout the pasture growing season. Horse traffic on fence lines and around gates and shade trees is more likely to stress pasture in either wet or dry seasonal conditions. Even if a pasture appears green from a distance and vigorous enough to support grazing, in time, weed invasion may make up 50% or more of the available forage. If you use mowing to control weeds, avoid mowing down below 75mm (3 inches) in height as the pasture may be checked and the weeds only topped to delay their maturity, often allowing more tillering and vigour on regrowth. It is also important to allow clovers and ryegrass to come to head and seed in spring to help maintain their longevity from year to year in the pasture.

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Toxic Plants in Pastures and the Risk to Horses

By John Kohnke and Mellisa Offord

Many species of plants, grasses, trees and shrubs contain toxic chemicals that have evolved in plants primarily to protect them from attack by insects. Some of these plant toxins are also poisonous to grazing animals. Horses have evolved to selectively graze a wide range of grasses and plants, however, they are particularly sensitive to plant toxins in comparison to other grazing animals, such as goats, sheep and cattle.

It is important for horse owners to be aware of potentially toxic plants and to limit their horses' exposure to these plants. Regular walks around the paddock at different times of the year is a useful way to keep check on the emergence of potentially toxic plants. Particular attention should be paid to the emergence of weeds along water ways, roads and fencelines. These are areas where weed seeds are most commonly deposited by car and foot traffic or through hay fed on the ground which may contain weed seeds, as well as by the flow of storm water. Be sure to also look at trees and shrubs, particularly along fencelines, as these are a potential source of plant poisoning. Ornamental tree and shrub species containing toxic chemicals, such as oleander, white cedar, green cestrum, foxglove and arum lily, can 'escape' back yards and can be found growing in horse pastures, or close to fencelines where leaves can be blown into the paddock or water sources.

Poisonous weeds and escaped ornamentals are not the only potential sources of toxic plant chemicals. Orchard trees from the Prunus species (plums, peaches, apricots, nectarines and almonds), contain chemicals which are responsible for plant-related cyanide poisoning. Sorghum grasses also contain these toxic chemicals, particularly Johnson grass, Sudan grass and Columbus grass, so it is important that these grasses don't dominate a pasture. Low-cyanide varieties of grain sorghum (*Sorghum bicolor*) are considered safe for horses to consume the actively growing plant, grain or hay. Many introduced tropical grasses contain soluble oxalates that can cause 'big head' in horses. These grasses will be discussed in detail on page 4 of this newsletter.

Hay is an important potential source of plant poisoning and spread of seeds which can establish a toxic weed colony in pastures when the hay is fed on the ground. It is important to check each new batch of hay to ensure it is not contaminated with potentially toxic weeds. Open the biscuits of hay out and check for foreign plants and identify them if possible, or remove them from the hay.

Identifying Toxic Plants in a Pasture

It is not always easy to identify which plants in a pasture are potentially poisonous. Some plants can be relatively easy to identify at all stages of growth, such as Paterson's curse, which grows in a rosette with hairy oval leaves in the early stages and has a distinctive purple flower at maturity. Other plants, such as grasses, can be very difficult to identify, particularly in the early stages of growth. Even at maturity, it can be very difficult to distinguish grass species when looking at the seed head. There are many field guides and online weed identification tools which can assist in identifying plants. Other resources which can help in identifying potentially poisonous plants are your local nursery or garden centre, a local agronomist, your state herbarium or your state Department of Agriculture. Some of these offer plant identification services and are well worth investigating.

Handy Hint 2

Controlling Toxic Plants

Keeping a good ground cover of desirable pasture species is the best way of avoiding the emergence and establishment of potentially toxic weed species. Individual toxic weeds can be pulled out by hand, but be sure to wear gloves to protect yourself from prickles, irritant sap or plant toxins. Mowing or slashing at the right time can help control weeds (see Handy Hint 1). If your pasture is dominated by weeds and poisonous plants, it might become necessary to completely renovate your paddocks. More information on improving pastures can be found in Issue 31 of Talking Horses. Sheep, cattle and goats are more tolerant of most toxic plants than horses. These species can be used to intensively graze an infested paddock to help control weeds. Herbicides can be used to control weeds and poisonous plants, either through spot spraying or boom spraying for large areas of weed infested pasture. Seek advice from your local produce store or agronomist to select the best weed control method for your specific area and the particular weed species which you are trying to control.

Did You Know That...

Many poisonous plant species do not lose their toxicity and are not any less dangerous to horses when they have been pulled from the ground or poisoned with herbicide. In fact, some plants become more palatable to horses when the leaves are wilting, compared to fresh plant material. It is very important to remove pulled weeds and shrub or tree trimmings from an area where a horse might have access. Remove horses from a paddock where herbicide has been used until the poisoned weeds are long gone and pasture is well established.

Plant Poisoning Risk Factors

Stage of Plant Growth: Some plants can be safe during certain parts of their maturity, but are poisonous at other times. For example, Annual Ryegrass can be toxic at maturity if seed heads are infected with bacteria.

Season: Some plants can be more toxic to horses at certain times of the year. For example, horses are more likely to develop Australian Stringhalt from grazing pasture infested with flatweed and dandelion in late summer or early autumn.

Environmental Factors: Drought, flooding and fire can significantly influence the risk of exposure to poisonous plants. During drought periods, weed species can often survive and dominate pastures where more desirable species have died out. Flooding can spread the seeds of potentially toxic plants to new areas. Plants, such as Nardoo, can grow quickly after flooding and can dominate waterlogged paddocks. Nardoo, like bracken, is a plant which can cause thiamine deficiency in horses when eaten in large amounts or accumulates after ingesting small amounts over several months. Many horses were lost due to Paterson's Curse poisoning in the Canberra area after bushfires in 2003. The weed was able to re-establish in burnt out pastures with young, succulent leaf growth before other grazing species of grasses could germinate and flourish.

Part of the Plant Eaten: Plants often contain different types or amounts of toxins in the various parts of the plant. For example, the ripe seeds of the black bean tree are thought to be the most toxic material when ingested. Perennial ryegrass is an important pasture species for grazing animals. However, it can be infected with an endophyte fungus which produces toxins. Perennial ryegrass pastures should not be grazed in autumn when close to the ground because the highest levels of toxins occur in the base of the plant.

Availability of 'safe' Feed: Horses will often only eat potentially toxic plants when the availability of good grazing pasture, hay or hard feed are limited.

Boredom: Inactive and 'bored' horses might indiscriminately graze on available plant material. This can sometimes happen if a young horse or a fit horse has to be confined to a small yard or paddock after injury. Any plant growing in the yard or paddock or hanging over a fence might be eaten by a 'bored' or a young horse, so potentially poisonous plants should be removed to prevent this before a horse is confined to a small area.

New Environment: Horses will sometimes graze on unfamiliar plants when they are new to a paddock or a particular area, especially when they've moved interstate where plant species might be quite different to the area in which the horse has previously lived. The risk of horses grazing unfamiliar and potentially toxic plants should be considered when transporting a horse and allowing them to 'pick' at grass during rest stops, or when being yarded overnight during transport or for a competition.

Age and health of the horse: A healthy horse can usually cope better when exposed to potentially poisonous plants compared to a young, old or sick horse.

Exposure to Poisonous Plants: A few potentially toxic plants scattered through a vigorous pasture are not usually a risk to horses. A horse will generally avoid unpalatable weeds and will consume enough good pasture to satisfy its grazing needs. There are some plants, however, which should always be controlled as they can be toxic in relatively small amounts, or the toxic effects can accumulate over time, causing serious health issues for the horse. These include Paterson's Curse, flatweed and dandelion, as well as shrubs or trees such as oleander.

SOME PASTURE PLANTS WHICH CAN BE A RISK TO HORSES

If your horse is ill and you suspect poisoning from a plant or other toxin, it is essential to consult your veterinarian.

Poisoning cases from the plants listed below are relatively rare and many of these grasses and clovers are important grazing species in Australia. Consult with your local agronomist to help identify pasture species on your property and to assist you in improving pastures if they are dominated by a species which can be a poisoning risk to horses.

Grasses & Clovers			
Name	**Signs of poisoning**	**Notes**	**Action**
Blue canary grass (*Phalaris coerulescens*) Paradoxa grass (*Phalaris paradoxa*)	In the small number of reported poisoning cases, horses had a sudden onset of symptoms, including unsteadiness and excitement, followed by rapid death.	Other species of phalaris are not considered to be a risk to horses, although some may contain low levels of toxins. Commercially available phalaris contains no toxins.	Don't graze horses on blue canary grass or paradoxa grass pastures, particularly during periods of rapid growth. Improve pastures to remove these grasses and include safer grasses and clovers.
Red clover (*Trifolium pratense*) Alsike clover (*Trifolium hybridum*)	Photosensitisation, particularly in light coloured horses. Skin around the mouth and nose can become cracked and weeping. Other signs include depression, head pressing (pushing against a solid surface with the head), colic, loss of appetite, yawning, blindness and inability to swallow.	The toxin in these clovers can cause liver damage which may ultimately lead to death. Mild cases can usually fully recover under veterinary care when the horse is removed from the pasture containing the clovers.	Ensure pastures do not become dominated by either red clover or alsike clover. Pastures containing greater than 50% of these clovers can cause liver damage in horses. Consult your local agronomist to help you identify the clovers in your pasture if you do not know the species.
Sorghums (includes Johnson grass, Sudan grass and Columbus grass)	Acute: rapid breathing, bright red mucous membranes, convulsions. Chronic: incoordination, incontinence (sometimes recurring urinary tract infections), constipation and weight loss.	Herbicides can increase toxin levels and make the plants more palatable. Consult with an agronomist if you plan to improve pastures to reduce sorghum grass content. Sorghum grain has low toxin levels and is considered safe.	Don't graze horses on young, growing sorghum-dominated pastures, particularly if damaged by frost or drought. Sorghum pasture over 50cm in height is considered safe for grazing. Sorghum hay should be cured properly before feeding to horses. Plant low-risk cultivars.
Panicum spp (includes giant panic grass, coolah grass, Guinea grass, millet panic and red switch grass)	Photosensitisation, particularly in light coloured horses. Skin around the mouth and nose can become cracked and weeping. Other signs include weight loss, 'off feed' and incoordination in advanced cases.	Poisoning more commonly seen in other species, especially sheep. Signs of poisoning in horses might start after several weeks grazing panic pastures.	Don't allow horses to graze panic pastures for long periods and watch for signs of photosensitisation. Rotate horses between pastures containing panic grasses and those containing other types of pasture species.
Perennial ryegrass (*Lolium perenne*)	Signs of 'perennial ryegrass staggers': easily startled, trembling, incoordination and 'splayed' hind limb stance with exaggerated flexion when walking. Sometimes the horse might 'collapse' and get up again a few minutes later.	The toxins which causes 'perennial ryegrass staggers' are produced by a fungus that grows on the plant. Fact Sheet #S7 'Ryegrass Staggers - Seasonal Alert' is available from Gary at **newsletters@kohnkesown.com**	Don't allow horses to graze perennial ryegrass pasture close to the ground where levels of the toxin are highest. Improve pastures so that perennial ryegrass is not the dominant species. If planting perennial ryegrass, choose low-endophyte varieties. Observe horses closely in high risk periods from summer to autumn.
Paspalum (*Paspalum spp*)	Signs of 'paspalum staggers': easily startled, trembling, incoordination and 'splayed' hind limb stance with exaggerated flexion when walking. Sometimes the horse might 'collapse' and get up again a few minutes later.	The toxins which causes 'paspalum staggers' are produced by a fungus which grows in the flower heads of the paspalum plant. The sign of 'paspalum staggers' and 'perennial ryegrass staggers' are the same, even though the causative fungus that grows on each plant and the toxins produced by the fungi are different.	Don't allow horses to graze paspalum pasture close to the ground where levels of the toxin are highest. Improve pastures so that paspalum is not the dominant species. Observe horses closely in high risk periods from summer to autumn, particularly if rain has caused a flush of growth.
Annual ryegrass (*Lolium rigidum*) Blown grass (*Lachnagrostis filiformis*) Annual Beardgrass (*Polypogon monspeliensis*)	Sudden onset of signs: muscle tremors, shivering, stiff-legged gait, stumbling, convulsions and in advanced cases death can occur. The condition is called 'annual ryegrass toxicosis' when caused by the ingestion of annual ryegrass which contains toxic bacteria.	The toxins that cause poisoning are produced by a species of bacteria which normally lives in the soil. The bacteria can sometimes gain entry and multiply inside a 'gall' which is formed by a nematode that can infect the seed head of these grasses.	Graze these grasses through winter and spring to prevent seed set. Avoid feeding annual ryegrass hay which contains a lot of seed heads. Consult with your local agronomist to establish whether your pasture which contains these grasses is infected with nematodes and then devise a management strategy to minimise risk.

OXALATE PASTURES

Oxalate chemicals are contained in the leaves of rapidly growing tropical grasses and hay such as setaria, buffel grass, Pangola grass, para grass, Guinea grass, kikuyu, signal grass and green panic. When eaten by horses, oxalates bind to calcium during digestion in the small intestine. The oxalates form a calcium-oxalate complex which is carried to the large intestine where it is liberated during microbial digestion. Unfortunately, 90% of calcium is absorbed from the small intestine of the horse. The calcium-oxalate complex is not digested and inadequate levels of calcium are absorbed to maintain blood levels for muscle and tissue function.

The lower blood calcium triggers the release of the parathyroid hormone from the pituitary gland, which then reabsorbs calcium from bone stores, especially the non-weight bearing bones of the upper face and skull. This results in weakening of the face bones, which are pushed out by the nasal contents as the horse grazes, to result in an enlarged nose and forehead, or 'Big Head'.

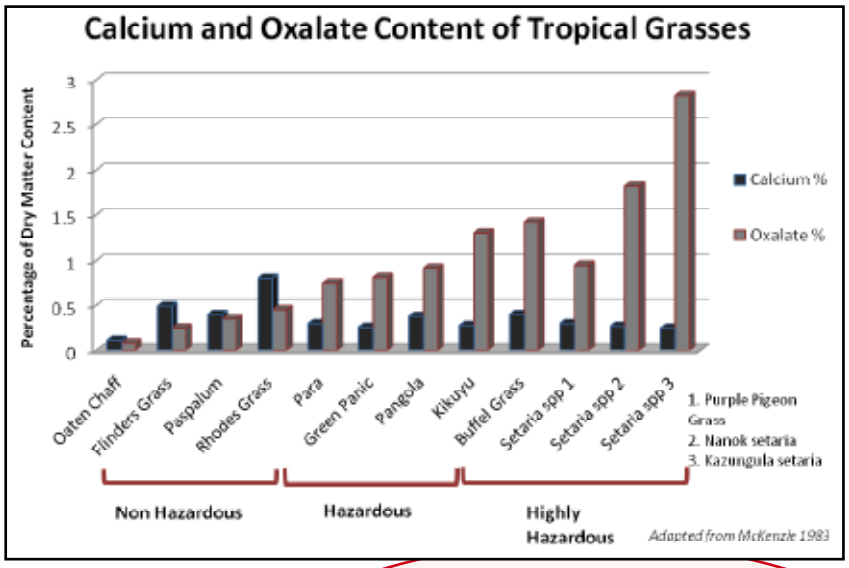
Large quantities of oxalate chemicals in tropical grass consumed by grazing horses can cause a significant reduction in calcium uptake and over a 4-6 week period, which can lead to the development of weakened bones and the appearance of 'Big Head'. This condition is also called Nutritional Secondary Hyperparathyroidism (NSH).

Early signs include a stiff and shortened gait, joint tenderness, weight loss and swollen jawbones. The problem should resolve in early cases if the horse is removed from oxalate pastures and provided with alternative pasture or hard feed.

Where horses have no alternative other than to graze oxalate dominate plants in pasture, it is important to provide supplements of calcium and phosphorus, as well as Vitamins A & D to counteract the reduced uptake of available calcium from the feed.

It is important to feed calcium supplements mixed into a small amount of hard feed, rather than allow horses to consume supplements by themselves provided in paddock feeders, or by high calcium blocks which are a 'hit and miss' way of supplementing calcium. Intake of oxalates just prior to, or following, the supplement can reduce the calcium absorption as oxalates taken in will bind the calcium released in the small intestine as pasture is grazed. It is best to bring horses into a yard and provide a hard feed containing calcium to ensure the optimum uptake of calcium in a 'bolus' of feed, not mixed with oxalates. More information is contained in Fact Sheet #N7 'Calcium and Oxalate Pastures', please email Gary at **newsletters@kohnkesown.com** to obtain a copy.

High calcium commercial feed mixes are available in tropical areas. However, to meet the need for energy and protein in horses grazing tropical pastures, these can be expensive and have to be fed at the recommended amount on the bag label. Economical mixes of calcium and phosphorus include 2 parts of dicalcium phosphate to 1 part of fine limestone, fed at up to 125gm (1/2 cupful) per 500kg bwt per day to high risk horses. Up to double this amount may be needed for 2-3 months to correct calcium deficiency and replenish calcium stores in severely affected horses. Molasses contains 10.3g calcium per litre and feeding up to 2 Litres of molasses per week to supplement pregnant and lactating mares is an optional additional source of calcium. **Kohnke's Own Cal-Xtra™** is formulated to provide a palatable low waste source of calcium, phosphorus, magnesium and Vitamins A and D. It is recommended for horses grazing on high oxalate pastures. It is the only acidified calcium supplement available to help assist calcium uptake from the small intestine. It also contains an oil coating to minimise any oxalates binding when mixed into feeds.



Handy Hint 3

Replacement of Calcium into Bone Stores

In severe cases of 'NSH' involving the limb bones and joints of working and growing horses, X-rays of the bones to determine their relative density should be taken before the horse is put back into training. It can take up to 12 months for calcium stores to be replenished and re-mineralisation is completed, to return bone strength and density. During this time, it is unwise to ride affected horses as bone fracture may occur, resulting in a fall and injury to the horse and rider.

Handy Hint 4

Rapidly Growing Grasses have high Oxalate Content

Some sub-tropical pasture grasses, such as kikuyu, contain more oxalates during periods of rapid, lush growth, particularly during warm weather following rain or irrigation in spring or summer. Oxalate content increases when pastures are fertilised with nitrogen and phosphates, for example poultry manure or N-P-K fertilisers. However, kikuyu grass which is short and dormant is generally not dangerous, even if large quantities are grazed, as the oxalate content is low. Even lucerne contains some oxalates, but studies indicate that the amount taken in by horses even on lucerne based diets, does not cause oxalate-induced NSH.

Reference: Much of the information contained in this newsletter was sourced from the book 'Plants Poisonous to Horses - An Australian Field Guide' with permission from the author. Published by RIRDC in 2006, written by Mellisa Offord. This book is available from RIRDC for purchase www.rirdc.gov.au or for free download from https://rirdc.infoservices.com.au/items/06-048