

## Red Maple Toxicity

I received a call several days ago that precipitated the writing of this fact sheet bulletin. The call was from a veterinarian in our Delaware area. His call was concerning the two horses he was about to examine that were laying down -flat out- in the pasture and unable to rise; both horses were depressed to the point of being non-responsive. Along with these two very sick horses, the veterinarian reported the unexpected and sudden death of two ponies pastured together with the two desperately sick horses. The story has a sad ending in that the two horses were beyond the help of therapy and required humane euthanasia. The veterinarian's investigation revealed a tree downed in the pasture from a nor'easter that had passed through our area several days preceding the deaths. We identified the downed tree as the common Red Maple, *Acer rubrum*.

[Red Maple, *Acer rubrum*]



The poisoning of horses by leaves of the Red Maple tree [also called the swamp maple] is a seasonal disorder that occurs during the summer and fall months. Fresh leaves right from the tree are safe and present no problem to a horse other than the danger of colic; not unlike the colic risk of a horse eating any strange food. But dried-wilted or fresh-wilted leaves are a different story; they are deadly to our horses, even deadly in very small amounts. Experimentally dried-wilted leaves are toxic when administered at a dose of 1.5mg/kg body mass. Translated: that is far less than a 1 ounce meal of dried-wilted leaves per 1000 pound adult horse; point of fact, the amount is about equal to the weight of two adult aspirin tablets. The exact toxin present in the Red Maple is unknown, but it is recognized and classified as an "oxidant" toxin. The clinical disease produced when horses eat fresh-wilted or dried-wilted maple leaves is that of an acute, hemolytic anemia. Hemolytic anemia is the abnormal break-down of the red blood cells, with ultimate destruction of the red blood cells. The red blood cells are responsible for carrying oxygen in the blood.

Signs of Red Maple toxicity generally start about 1-2 days following eating of wilted leaves, or dried leaves from a wilted leaf source. That distinction is important to understand.

The toxicity is known to occur only when Red Maple leaves have wilted. Wilted leaves are different from leaves which become beautifully colored and naturally drop from a tree in the autumn. Dropped autumn leaves are not recognized to be deadly to the horse. The toxin is released only when a limb has fallen or has been fresh cut from a green tree and the leaves wilt; the dried leaves from autumn do not contain the toxin. Affected horses are acutely lethargic, that is they appear to be sleeping on their feet, non-responsive and will not wake up. Affected horses will not eat; they are weak and depressed. The poisoned horse will be breathing with exaggerated effort, heart rates will be greatly elevated, but they will not have a fever. Death occurs 3-7 days following wilted leaf ingestion in more than 60% of horses that eat wilted Red Maple leaves. Because we do not know the specific toxin, there is no antidote. Therapy is supportive, including IV fluids, oxygen supplementation and blood transfusions; but please recognize and understand that in many cases even aggressive therapy is unrewarding.

Prevention is key and is accomplished simply by preventing exposure of horses to the wilted leaves of Red Maple trees. Accidental exposure generally occurs following storm damage and following the routine trimming of trees from pastures and the trimming of trees lining horse pastures. Prior to the removal of the limbs, horses nibble on the wilted leaves. I have also had cases where horses have reached through fences to nibble on wilted leaves from branches piled up following trimming or storm downed limbs. Inspect your pastures regularly, especially following high wind storms. Use wisdom when trimming trees, there is no wilted leaf that is healthy for our horses to nibble upon, and some, like the Red Maple are deadly. Be vigilant of power and phone line crews as they may unwittingly provide our horses nibbling opportunities.



(Red Maple leaves)



(Red Maple fruit)



(Red Maple bark)



(Red Maple Twig)

(Pictures courtesy of the Virginia Tech Forestry Department Web Site)

Accurate identification of the various species of the Maple Tree is most important to the prevention. But herein lies the last major problem with Red Maple toxicity. There are 13 native Maple Tree species growing in our area, of which the Red Maple is one. However, there are over 125 introduced maple species in our region, making exact Red Maple identification a project for the experts. For us, this means we must keep our horses free from having access to wilted maple leaves altogether. To add emphasis to the last statement, recent veterinary scientists have chemically identified the presence of the “oxidant” toxin to exist in all maple tree species, just at a much lower level than the Red Maple. Knowing this fact and the difficulty in positively differentiating Red Maple from other maple species; it is most important we manage proactively to protect our horses from ingesting wilted maple leaves.