Nursery Plants that may be Harmful to Camelids

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This is the time of year that we often receive questions concerning the winter planting of trees, shrubs, or ground cover to spruce up homes and farms. Most of these questions revolve around the danger of landscaping plants to livestock. These plants, also called cultivars, have been selected by nursery owners for their hardiness as well as their attractiveness.

Cultivars, however, usually are not native to an area in which they are being sold. Some may come from different continents, such as the European Yew and Japanese ground-cedar. Others may simply be transported across our own continent. For example, the Oleander bush that has been brought to the east coast from the west coast, or the red maple that have been brought from the east coast to the west and can now be found in a large numbers in west coast nurseries.

Unfortunately, while cultivars may be hardy and attractive to look at, they also include some of the most poisonous plant species known to humankind. In this article we will identify some of the most dangerous cultivars on the market that ranch owners should try to avoid.

To those not familiar with botanical/medical terms, "poisonous" is used to describe the general potential of a plant to do harm. The poisonous element may be introduced into a body through 1. ingestion of a plant part that contains toxins (e.g. black cherry leaves), 2. mechanical penetration (e.g. thorns of briar), and/or 3. absorption through the skin or other membranes (e.g. poison ivy). The latter two normally do not cause death. We will, therefore, concentrate on the first form of poisoning: ingestion. Toxicity is used in this article to refer to the toxic agent, which, in this case will be an ingested poisonous substance that can be either a chemical (such as nitrates or selenium) or a protein structure contained in plant tissue.

There are over 240,000 species of plants worldwide with well over 20,000 in North America alone. It has been estimated that nearly half of those may be, at least in some form and in varying quantities, poisonous to humans and/or animals. With that in mind, this article will emphasize only woody plants that are commonly sold commercially throughout the US and Canada and are know to be toxic to livestock.

We have chosen to arrange the plants by phylum (conifers first, angiosperms second) and alphabetical by either family (if more than one genus is discussed) or by genus (if only one genus is discussed). Common names can often be confusing; therefore, we have provided the genus and species with the common name of each plant for clarity.

Jim discussed a number of landscape species in past CQ poisonous plant articles. Therefore, to provide space for other species in this article we will not repeat those plants but will provide you with the appropriate reference. There will be a few exceptions, however, as we do feel strongly about re-iterating the dangers of the most poisonous ones (e.g. yews, oleanders, and cherries).

Finally, we cannot emphasize enough the fact that most plant poisonings of livestock comes from ingestion of poisonous plants by hungry or starved animals. In many cases, if adequate pasture or good quality hay been available it is likely that the poisoning would not have taken place. As always, in case of any suspected poisoning, call your vet immediately. Separate the animal from the possible source of poison to avoid further damage, and keep the animal as calm as possible - companion animals may help, but make sure the poison has been removed first.

CONIFERS (CONE-BEARING PLANTS)

Cedars

Numerous cedars, including members of the genus Juniperus and Cupressus, contain a toxin thought to be responsible for "pine needle abortion". The toxin has been identified as isocupressic acid (IA) and is also found in other genera of conifers (it is particularly prevalent in the Ponderosa pine, Pinus ponderosa, from whose needles the name for the poisoning comes). Monterey cypress (Cupressus macrocarpa), a west coast plant found in nurseries, and the Japanese ground cedar (Juniperus horizontalis), are known to contain IA (Monterey cypress is known to have caused abortion in livestock) and should be considered poisonous. Signs of IA poisoning include: swollen vulva and/or mucilaginous discharge (that may precede abortion), premature parturition, or stillbirth.

Yews

Even though yews have been covered in past articles, they are so toxic that it is important that we include them here as well. Because of the ease in propagating, easy maintenance, clean looks, and rapid growth, yews are a popular landscape species around commercial buildings. In fact, I noted numerous large specimens of the European Yew (Taxus baccata) planted around the entrances to the Kentucky Horse Center in Louisville, Kentucky, when last attending the AOBA Nationals.

The two most common yews on the market are the European yew and the Asian yew (T. cuspidate from eastern Asia). Unfortunately, both of these plants, particularly the European yew, have caused SUDDEN DEATH. Animals have actually been found with twigs and leaves hanging out of their mouths! In some cases animals have shown no signs before succumbing to the toxin. In others, they present with nervousness, trembling, difficulty breathing, and

diarrhea. Larue Johnson (2003) has noted that llamas have been poisoned by yew. These plants are, therefore, very dangerous and should never be planted where animals may have access to them.

Several members of the conifers commonly sold in nurseries have NOT shown poisoning and may be safe around your farm. These include Leyland cypress (x Cupressocyparis leylandii), blue spruce (Picea pungens), and the Normann fir (Abies nordmannia). In general, most spruces, firs, and pines (other than the Ponderosa pine) are probably safe, but we would advise you to make certain that plenty of pasture or good quality hay is available at all times. The needles of conifers are more acidic than normal graze material; therefore, if they became a large part of any animals diet, ulceration in the digestive system may become a serious problem.

ANGIOSPERMS (FLOWERING PLANTS)

The term angiosperm refers to the botanical grouping of plants that contain protected ovules (fruit). The grouping is also often referred to as the flowering plants, in reference to multiple, often showy, reproductive structures (as compared to the simple cones of the conifers). This is a very large group and comprises over ninety-eight percent of all the higher plants (i.e. plants other than alga and mosses).

Bean Family

Poisonous genera of the bean family that are commonly available commercially include the locoweeds (Astragalus and Oxytropus - we'll save discussion of the locoweeds for another article), Cassia (Sennas), Gymnocladus (Kentucky coffee tree), Laburnum (goldenchain), Lupinus (lupines), Poinciana (bird of paradise), Robinia (black locust), and Wisteria (2 species of concern).

The most widely planted and controversial member of this group is the wisteria. European in origin, they were considered toxic before the turn of the century, but were omitted from mid 20th Century lists of poisonous plants. In the last half of the 20th Century, however, numerous cases of wisteria poisonings, particularly from the Japanese (W. floribunda) and Chinese wisterias (W. sinensis) have been documented by several authors and poison control centers.

The level of toxicity may be mild and most animals seem to avoid the foliage of this vine, but we would not recommend planting it when so many non-toxic species are available.

Boxwood

Boxwood (Buxus sempervirens) is a woody shrub that is commonly planted as a hedge in the temperate and subtropical regions of North America. Our forefathers originally brought it to this country in colonial times. Therefore, it is quite common around many of our historical sites.

The poisonous principal is an alkaloid that we know little about. Both Kingsbury (1964) and Knight and Walter (2001) indicate that boxwood is toxic to camelids. Doses as low as 1.5 lbs of green leaves have proven lethal to horses. Kingsbury also notes that the plant is commonly used as a hedge species and that the loss of livestock was often due to foraging on improperly discarded clippings. Signs of poisoning may include severe gastrointestinal distress, bloody diarrhea, and respiratory distress. Death, if it occurs, is usually due to respiratory failure.

Heath Family

Several species in this family, including rhododendron and azalea (both belong to the genus Rhododendron), are known to have poisoned camelids. The principle toxin is a resin, andromedotoxin (however arbutin, a glycoside of hydroquinone, is also present) and all portions of the plants are toxic, either green or dry.

Other commercially important members of the family known to be toxic include: mock azalea (Menziesia ferruginea), Japanese pieris (Pieris japonica), and two species of laurel (Kalmia latifolia and K. polifolia). Members of this family are, for the most part, avoided by livestock except under poor pasture conditions. Signs of poisoning include repeated swallowing, copious salivation, slow pulse, lowering of blood pressure, convulsions, progressive paralysis, and death. You can read a more in depth treatment of this family in Jim's Winter 2003 CQ article.

Jimsonweed

There is only one woody member of this paradoxical (very poisonous and very edible) nightshade family that is sold commercially throughout the US: the Angel's trumpet (Datura suaveolens). Planted for its showy, foot-long trumpet shaped flowers, the Angel's trumpet is a native of Mexico and has become a favorite landscape shrub in the southern, subtropical US. Angel's trumpet contains the same poisonous alkaloids as many of the other members of the genus. Some of the alkaloids, such as atropine and scopolamine, are not only toxic but have played important roles in human medicine.

Kingsbury notes that 4 to 5 grams of leaves (approximately 5 to 10 leaves) have proved fatal to a child. All classes of livestock have succumbed to the lethality of the Angel's trumpet. Luckily, most animals find the taste of the plant quite disagreeable and ingestion appears to be forced by a lack of any other forage. Therefore, plenty of good pasture or hay would be essential if this species is to be located near livestock.

It is very important to note that members of this genus are more dangerous to humans than to livestock. Children have died after ingesting various parts of the Datura plant, including the flowers, leaves, and seeds. They appear to be attracted to the showy flowers and have a tendency to suck the

nectar (highly toxic) from the disk located at the base of the flower.

Signs of Datura poisoning include dilated pupils (may be prolonged for several weeks even after toxicity has subsided), incoherent motion and/or irregular general behavior (hallucinogenic effect), rapid and weak heartbeat, and, in the case of progressive poisoning, you mat see convulsions followed by coma.

Oleanders

The oleanders (Nerium oleander and Cascabela thevetioides) are plants that Jim has written about in previous articles. But, since they are so toxic and such a popular landscaping plant in the southern US, we feel we must include them here as well. All portions of the oleander plant (flowers, fruits, leaves, and stems) contain toxins (a cardiac glycoside called oleanderase nerioside) of which ingestion of a very small amount have caused death in livestock (including camelids) and humans.

Kingsbury (1967) noted that the lethal dose for horses or cattle was 0.005% of their body weight; that would translate to 1/100 of a pound (approximately only one leaf) for a 100lb animal. Signs of poisoning include increased pulse rate (until terminal stage, where it will decrease rapidly), discoloration of the mouth (white instead of pink), vomiting, weakness and bloody feces. If death occurs it will usually follow within a day.

Livestock will generally not graze oleander plants if good pasture and hay are available. However, oleanders definitely belong on a list of plants that should not be on a ranch.

Rose Family

Commercially available trees in the rose family include cherries, apples, peaches, plums, and apricots. They, as well as other members of the rose family, contain, in various amounts, a toxic chemical that is classified as a cyanic-glycoside (aka hydrocyanic acid).

Hydrocyanic acid is a long chain hydrocarbon (a sugar) that, when grazed by livestock, produces a very undesirable byproduct: cyanide. Apple or peach fruit, seeds, and leaves all contain small amounts of hydrocyanic acid and have caused poisoning in cattle and sheep in the US. Unfortunately, livestock readily graze the leaves from the trees in this family, even when good pasture is available. Therefore, even though the toxin is found in small amounts in the commercial members of this family, poisoning by grazing on the foliage may be possible, particularly to curious crias.

Since a crias ability to cope with environmental and physiological stress is still in the early stage of development, and their curiosity makes them more willing to chew on things their mom's won't touch, I strongly recommend against keeping them in a pasture that has a member of the cherry sub-family. Even though we don't have any record of cria poisonings, the potential is there. Therefore, we recommend removing, or prohibiting access of camelids to all cherry, apple, and peach trees, including fruit, seeds, and foliage.

Signs of cyanide poisoning include stimulation of respiration, followed by shortness of breath and overall difficulty breathing, a strong bitter odor to the breath, gasping, staggering, prostration, and, eventually, coma and possibly death.

Conclusions

We cannot end without emphasizing to those who would like to landscape their ranch how important it is to know what plants are safe and which ones are not. While we're sure no nurseryman or landscaper would wish your animals harm, their expertise lies in growing plants, not in identifying toxic ones.

Seek the advice of local experts in your area, including botanists at local universities, extension agents, and your vet. The bottom line may be that you may not be able to plant that Angel's trumpet or its relatives, but your ranch will be safer for it.

CQ

Acknowledgements:

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Literature Cited and Recommended Reading:

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Kingsbury, J.M. 1964. Poisonous Plants of the United States and Canada. Prentice-Hall, Inc., Edgewood Cliffs, NJ. 626pp.

Knight, A.P. and Walter. 2001. A Guide to Plant Poisoning of Animals in North America. Teton NewMedia, Jackson, WY. 367pp.

Perry, J.E. 2003. Managing your ranch for poisonous plants. Camelid Quarterly 2(4):7-13.

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Web Sites of Interest:

Canadian Poisonous Plants Info. System (presents all potentially poisonous plant north of the US border):
http://www.cbif.gc.ca/pls/pp/poison?p_x=px

Cornell University:
http://www.ansci.cornell.edu/plants/index.html

Oregon State University (complete list of western North American species):
http://extension.oregonstate.edu/linn/content1/poisonplants.php

Virginia Polytechnic Institute and State University (VPI) Department of Forestry (excellent site for a written description and distribution, and photos of all North American trees):
http://www.cnr.vt.edu/dendro/dendrology/factsheets.cfm

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Dr. Jim Perry has studied plants and their dynamics for over twenty-five years. He currently conducts research and teaches courses in plant identification, coastal ecology, and global natural resource management at the College of William and Mary, Virginia Institute of Marine Science graduate program. Patty Richards has a Bachelors of Landscape Architecture from Virginia Polytechnic Institute. She currently runs their ranch, Ambler's Alpacas (named after Ambler, their golden tabby cat who still believes he runs their ranch) in Lanexa, Virginia. Jim and Patty have owned camelids since 1995 and currently have over thirty alpacas and llamas on their farm.

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