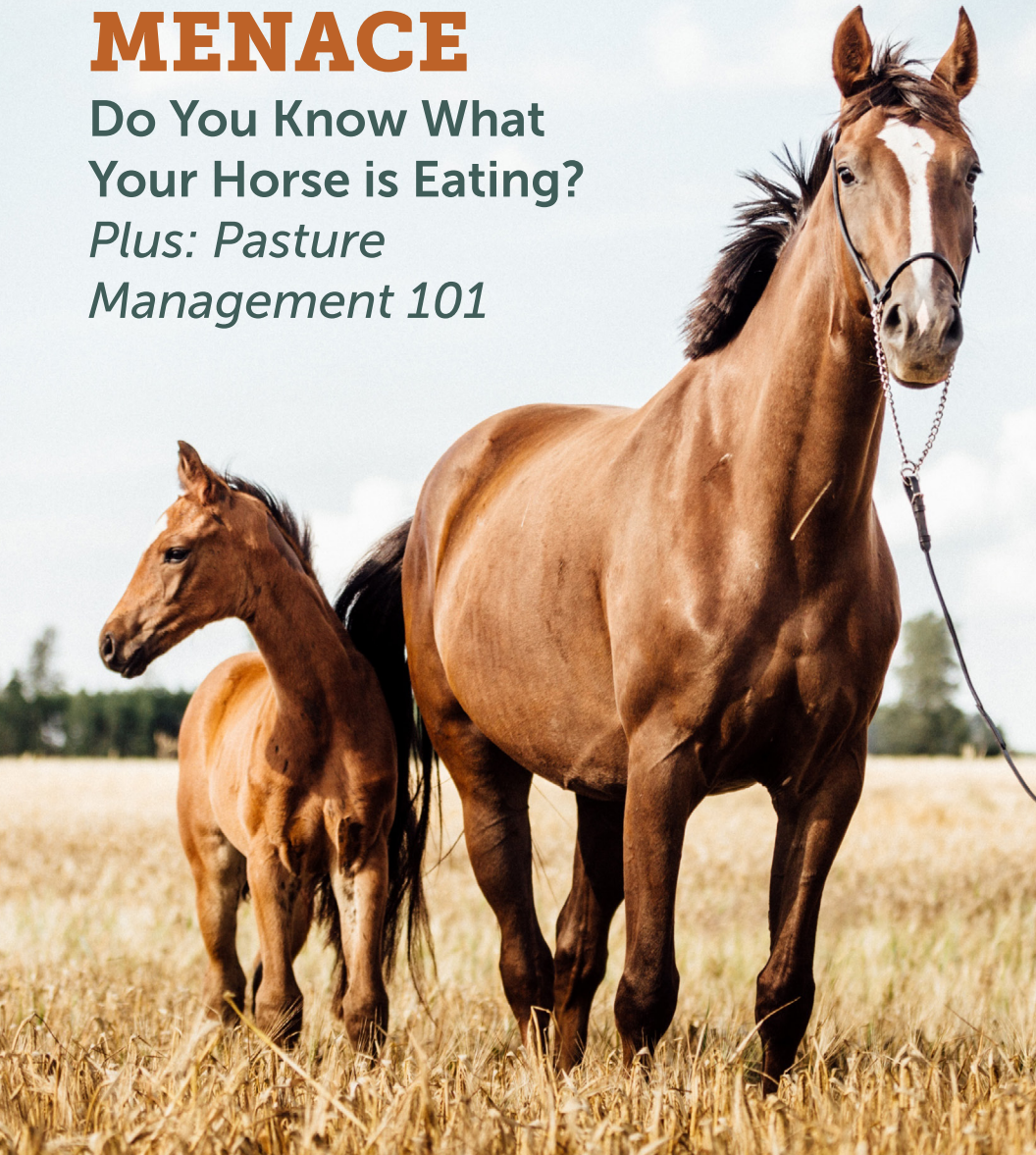
COLORADO POISONOUS MENACE

Do You Know What Your Horse is Eating?

Plus: Pasture Management 101



Horses in Colorado

According to the Colorado Horse Development Authority and the American Horse Council, approximately 180,000 horses called Colorado home in 2023, and over 430,000 acres in the state are utilized by horses. In 2017 Colorado's horse industry pumped approximately $1.8 billion into our state's economy and provided over 34,000 jobs to our residents, while more than 697,000 Coloradans consider themselves horse enthusiasts.

In addition to these impressive numbers, horses have a value beyond money. They are intelligent and beautiful animals that provide loyal service and companionship to their owners year after year. In return, horse owners take care of their equines, providing them with forage, pastureland and shelter.

Unfortunately, some plants growing in Colorado do not provide horses with nourishment. Instead, these poisonous plants cause illness and even death in horses, even if they only ingest a small amount. Noxious weeds may outcompete more palatable forage, depriving horses of essential nutrition. Therefore, identifying plants of all kinds in horse pastures is a small price to pay for keeping our horses safe and healthy.

The Main Reasons Horses Are Harmed By Poisonous Plants:

1. Some plants grow prolifically in Colorado and can be difficult to eradicate.
2. Poor pasture management.
3. Plant identification can be difficult, learning to identify plants takes time and effort.
4. Low quality feed or low quality supplemental forage provided to horses that does not meet their nutritional needs.

The Colorado Department of Agriculture (CDA) is committed to the management of noxious weeds in our state. Plants designated by CDA as noxious weeds must be managed by each landowner in Colorado. Horses are well worth protecting as they are a valuable resource to the state of Colorado for agriculture, recreation, and the preservation of undeveloped lands.

This brochure is designed to help horse owners recognize and prevent poisonous plant problems before harm occurs to horses. It will help you pinpoint poisonous species in your area and recognize any developing or existing health problems that your horses may have. Some poisonous plants in this brochure are native and some are noxious weeds; both are highlighted because of their potential impact on horses. Finally, this brochure summarizes good pasture management practices to keep your land and your horses safe and healthy.

Identifying Colorado's Worst Poisonous Plants for Horses

The top plants dangerous for horses are commonly found in Colorado pastures and rangelands. These plants should be at the top of your list to identify and remove from your horse's pasture.

SENECIO & PACKARA

(Approximately 25 species in these related genera are toxic)

- Genera of the sunflower family *(Asteraceae)*
- Wide range of forms including annuals, perennials, aquatic forms, climbers, succulents, shrubs, and small trees
- Common names include groundsels, ragworts, lamb's tongue, butterweeds, stinking willie, old-man-in-the-winter
- Single layer of touching, but not overlapping, greenish bracts surrounding the flower
- Alternate leaves, composite flower heads flattened clusters with showy yellow flower in a ray pattern
- Young, pre-flowering plants are the most toxic; plants are not usually very palatable but are poisonous in hay where it is harder for the horse not to eat it.

EFFECTS AND SYMPTOMS:

- *Senecio* species cause liver failure in horses
- Diarrhea, weight loss, anorexia, sensitivity to light, poor hair coat, violent behavior, circling, aimless wandering, head pressing, excessive tearing, swollen red eyes, yellow coloration of mucous membranes, red-black urine; bloodstained feces, fetuses may be affected in utero
- No treatment available

LOCOWEED (3 SPECIES): Purple *(Oxytropis lambertii)*, White *(Oxytropis sericea)*, and Woolly *(Astragalus mollissimus)*



- Legume family *(Fabaceae)*; annual or perennial
- Common name: locoweed, vetch
- Leaf patterns common to all 3 species paired off along stem
- Leaves are long and thin or slightly rounded
- Woolly locoweed leaves have a covering of white hairs that appear a silvery-blue
- Horses can develop a taste for locoweed and may become addicted to it

EFFECTS AND SYMPTOMS:

- Locoweed affects the horse's nervous system
- Weight loss, abortions, fetal deaths, abnormal births, sudden changes in temperament, aimless wandering, impaired vision, depression, excessive sleeping, violent reactions to routines such as putting halters on or trailering
- May be irreversible or long, slow recovery

POISON HEMLOCK *(Conium maculatum)* and **WATER HEMLOCK** *(Cicuta douglasii)*

- Parsley family *(Apiaceae)*; biennial
- Small white flowers in umbels
- Poison hemlock has fern-like leaves, purple-spotted stems and a taproot
- All species in the genus Cicuta are highly toxic
- Water hemlock has large, serrated leaves, hairless stems and a cluster of fleshy taproots at its base; perennial
- Found in wet areas
- Exude an unpleasant, parsnip-like odor when cut

EFFECTS AND SYMPTOMS:

- All parts of the plants are toxic
- 8 ounces of water hemlock can be fatal; 4-5 lb of poison hemlock is fatal
- Effects are on the central nervous system
- Nervousness, trembling, and incoordination may be observed
- Horses typically become violent, with muscle tremors and convulsions

HOUNDSTONGUE
(Cynoglossum officinale)

- Forget-me-not family *(Boraginaceae);* biennial
- Named for rosette of leaves that are shaped like a dog's tongue in the first year of growth
- Forms flowering stalk the second year with stems reaching 2-4 feet in height
- Flowers are reddish-purple and grow along the length of the stem
- Herbicide can increase palatability, and plants are most palatable when dried in hay

EFFECTS AND SYMPTOMS:

- Houndstongue causes equine liver damage
- Weight loss, excessive yawning, circling, sensitivity to light, jaundice, diarrhea, red urine.
- No treatment for liver disease

BLACK HENBANE
(Hyoscyamus niger)

- Nightshade family *(Solanaceae)*; annual or biennial
- Large, very hairy, sticky branching erect herb
- Leaves alternate, simple, stalkless except at base, coarsely toothed, 4-8 in long
- Flowers greenish yellow or white with prominent purple veins
- Flowers produced in the leaf axils

EFFECTS AND SYMPTOMS:

- All parts of the plant contain toxins
- Effects are on the nervous system; animals may have difficulty seeing normally
- Excitement and convulsions may occur when large amounts of plant are eaten
- Decreased salivation, bloat, intestinal stasis, colic, and diarrhea
- Elevated heart rate
- Muscle weakness
- Drugs can help reverse the effects

YELLOW STARTHISTLE
(Centaurea solstitialis)

- Sunflower family *(Asteraceae)*; annual herbaceous
- Yellow flowers at ends of branches
- Flowers surrounded by 1 inch spines
- Bracts are tipped with stiff yellow spines
- Blue-green leaves covered with cottony hair
- Up to 3 feet in height
- Palatable to horses
- Toxic in both its green and dried states

EFFECTS AND SYMPTOMS:

- Starthistle affects the nervous system and causes necrosis of the brain
- Facial muscles frozen, excess salivation, severe weight loss, drooping lip or facial features, tongue hangs out, horse laps water like a dog, acts as if something is caught in their throat
- Horses must eat over 20% of their body weight of this plant over the course of 1-3 months to become poisoned
- No treatment, euthanasia recommended to avoid subjecting the horse to starvation

DEATH CAMAS
(Zigadenus Michx)

- Lily family *(Liliaceae)*; perennial
- Central stalk with a cluster of white or cream-colored flowers
- Flat, grass-like leaves growing from a basal rosette
- Underground bulb similar to an onion but does not smell like onion
- Most toxic during the spring; the bulb is the most toxic plant part

EFFECTS AND SYMPTOMS:

- Increased or irregular pulse
- Weakness and stumbling
- Excessive salivation; froth at the mouth and nose
- Difficulty breathing
- Toxicity effects take place quickly after poisoning and are deadly
- A significant amount of this plant needs to be consumed for it to be toxic

Problem Plants

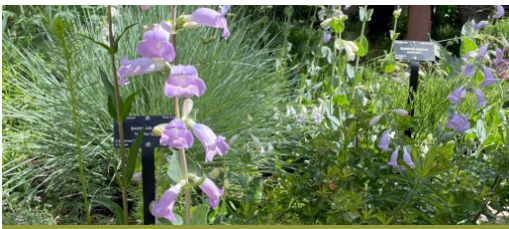
Several other plant species are toxic to horses, causing a range of medical problems. A few, such as monkshood and species of nightshade, can cause immediate death. Others result in death or permanent damage to the horse if not caught in time. However, there are few cases of equine poisoning due to these plants.

Selenium Accumulator plants absorb selenium from the soil. When ingested by the horse, selenium replaces the sulfur found in keratin, the primary protein in hoof and hair structures. Altering the composition of keratin, an important building block for strong hooves, may cause severe abnormalities. As the structure of the hoof breaks down, its walls may crack. While not fatal, prolonged ingestion of these plants can cripple the horse for life. Selenium accumulators also cause serious damage to the horse's musculoskeletal system.

Obligate Selenium accumulators: penstemon *(Penstemon* spp.*)*, prince's plume *(Stanleya pinnata)*, woody aster *(Xylorhiza glabriusculaa* Nutt.*)*, two-grooved milkvetch *(Astragalus bisulcatus)*

Potential Selenium accumulators: gumweed *(Grindelia* spp.*),* saltbush *(Atriplex* spp.*)*, Indian paintbrush *(Castilleja* spp.*)*

prince's plume *(Stanleya pinnata)*



penstemon *(Penstemon* spp.*)*

saltbush *(Atriplex* spp.*)*

Indian paintbrush *(Castilleja* spp.*)*

Oxalate & Nitrate/Nitrite Poisoning

Oxalate levels vary within the plant, with leaves typically containing higher amounts than stems. Plants with high levels of oxalates can contribute to secondary calcium deficiency, causing weakened bones, increased susceptibility to fractures and other adverse effects. Severe cases can lead to permanent kidney damage, which can become life threatening.

Nitrate toxicity is less common in horses but can occur with high ingestion of nitrate- accumulating plants. Signs of nitrate/nitrite poisoning include colic, diarrhea, respiratory difficulty, weakness, muscle tremors, abnormal gait, shaking, elevated heart rate, seizures, blue to brown discoloration of the gums, and death. Nitrite is absorbed into the blood, where it damages hemoglobin and converts it to methemoglobin, which cannot carry oxygen. Blood in affected animals might be chocolate brown instead of deep red.

Examples of oxalate and nitrate accumulator plants include: curly dock *(Rumex crispus)*, redroot pigweed *(Amaranthus retroflexus)*.

Nitrate accumulator plants include: johnsongrass *(Sorghum halepense)*, jimsonweed *(Datura stramonium)*, kochia *(Bassia scoparia),* and lambsquarters *(Chenopodium album)*.

Poorly Managed Pastures

Some plants are problematic when the pasture is poorly managed, and these plants are able to create monocultures. Horses who eat large amounts of these plants (over 60% of their bodyweight) may see injurious effects, most of which can be reversed by removing the horse from the contaminated pasture.

Problematic plants in poorly managed pastures: milkweed species (unpalatable but highly poisonous - *Asclepias* spp.), some lupine species *(Lupinus L.* spp.*)*, Russian knapweed *(Rhaponticum repens)*, sand and fringed sage *(Artemisia filifolia and A. frigida)*. Knapweeds and sages affect the nervous system.

Leafy spurge *(Euphorbia esula),* field bindweed *(Convolvulus arvensis)*, yellow sweet clover *(Melilotus officinalis)* and alsike clover *(Trifolium hybridum)* can increase skin sensitivity to light, burns or cause colic. Horses will generally prefer other vegetation than these plants if available. However, these plants spread aggressively and tend to overtake a pasture or hay field.

See below for good pasture management practices.

Injurious Plants

Plants with burrs, barbed awns or spines: buffalo burr *(Solanum rostratum),* burdock *(Arctium* spp.*),* cocklebur *(Xanthium* spp.*),* puncturevine (*Tribulus terrestris)*, sandbur *(Cenchrus* spp.*),* black locust *(Robinia pseudoacacia)* and Russian olive *(Elaeagnus angustifolia)* trees.

Grasses: Most grasses can be grazed at certain times of their life-cycle, typically towards the earlier stages. Many native and non-native grasses can turn injurious as they dry and go to seed. Examples of potentially injurious grasses include native foxtails (*Alopecurus* spp.) and the noxious weed cheatgrass *(Bromus tectorum)*.

Other Potentially Problematic Plants: Bracken fern *(Pteridium aquilinum)*, horse nettle *(Solanum carolinense)*, horsetail *(Equisetum* spp.*)*, oaks *(Quercus* spp.*)*, red maple *(Acer rubrum),* switchgrass *(Panicum virgatum)*, chokecherry *(Prunus virginiana)*, wild plum *(Prunus americana)*, halogeton *(Halogeton glomeratus)*, and Kentucky coffee tree *(Gymnocladus dioicus)*.

BE AWARE:
What is your horse eating?

The easiest and most cost effective way to protect your horse is to prevent them from ingesting harmful plants in the first place. Providing your horse with good pasture is where the battle against poisoning begins. Most horses will not eat plants that are bad for them as long as other forage is available. This means providing them with good pasture during the spring and summer months, and making sure they are fed good quality, weed-free hay during the winter.

Major Steps For Preventing Equine Plant Poisoning

Check Your Bales

Weeds in baled hay can pose significant problems, introducing toxic plants and weed seeds onto your property. Common potentially toxic plants like pigweed and kochia are nitrate accumulators. It's important to inspect your bales for weeds and feed with caution. If you find weeds in your hay, properly identify them to rule out poisonous plants.

Inspect your hay for mold, as molds can produce spores that cause respiratory problems. Mold on yellow sweet clover *(Melilotus officinalis)* hay is particularly dangerous. If your hay is moldy, get it tested to understand concentrations. Use precaution when feeding moldy hay by pulling flakes apart before feeding, feeding in a well-ventilated area and restricting the horses ability to bury their nose into the hay. Wet the hay to reduce the amount of mold spores inhaled.

When in doubt, consult your vet or a CSU Extension specialist. Testing your hay at a reputable lab is a good practice, not only to check for toxic levels and mold but also to understand its nutritional value.

Species problematic in hay: horsetail *(Equisetum* spp.*)*, hoary alyssum *(Berteroa incana)*, yellow sweet clover *(Melilotus officinalis)*, yellow starthistle (*Centaurea solstitialis)*

On Your Land

Identification

Identify what should and should not be growing in your pastures. Many plants are easy to identify once they have bloomed; however, by that time plants may have already begun to spread and may be more difficult to remove. Early detection is important, so horse owners should familiarize themselves with not only the flowering stage of poisonous plants, but pre-flowering stages as well. Correctly identifying plants in your pasture can help you understand the best control method. Contact your county weed supervisor or local CSU Extension office for help with identification and management options. These contacts can be found in the References section of this brochure.

Poisonous Plant Control

Be proactive in controlling harmful plants. The best control options will depend on the target plant(s). In general they may include mechanical (mowing or pulling), chemical (synthetic and organic options), and/or biological (introduction of natural predators such as leafy spurge flea beetle) controls. Remember to control weeds and poisonous plants in ditches and along fence lines. It may take several years to eradicate weeds from your pastures. Be patient and persistent.

Pasture Management
A well-managed pasture is not only a natural shield against toxic encroachers, it also reduces soil erosion, restores healthy soils, and mitigates climate change. Good pasture management practices include:

- Provide good forage, such as native or introduced grass species for your horses and they will be less likely to seek out toxic plants.
- Rotate horses from one pasture to another so the forage grasses can recover and regrow. Do not allow pastures to become overgrazed. Many weeds appear in recently disturbed or untended fields.
- Irrigate pastures if possible. Grasses will recover and regrow much quicker with regular moisture.
- Spread manure annually with a harrow or rake to break-up hard materials and distribute nutrients more evenly.

Pasture Management for Horses on Small Acreages

As a horse owner, you will need to decide if your pasture will be used for recreation or nutrition. Answering the following questions can help you make that decision:

- How many horses do you have?
- What size is your pasture?
- Is the pasture dryland or irrigated?
- How long will you need the pasture?
- What months do you want to use this pasture?

Recreation Pastures

Grass species for a recreational pasture should be selected based on their ability to withstand wear and tear and not be based on forage quality. Species such as crested or western wheatgrass, intermediate wheatgrass, and endophyte-free tall fescue can be considered. If possible, turn horses out for several hours of exercise and grazing per day, returning them to a barn or dry lot at night.

For dryland recreational pastures, you may need to delineate a sacrifice area/pasture, as it may become bare with heavy grazing. This technique can be used with smaller acreages to preserve a few pastures with healthy grass for occasional grazing, and utilize a sacrifice area for daily recreational use.

Nutrition Pastures

A mature horse consumes 1.5% or more of its body weight in forage dry matter per day. If the primary nutrient source is pasture, a 1,000 pound horse will consume and waste approximately 3,000 pounds of forage dry matter during a typical 6-month grazing season. Thus, with average management, it would take about 2-3 acres of irrigated pasture, or 30-40 acres of dryland pasture to meet the nutrient needs of one mature horse.

Cool-season grasses, such as orchard grass, wheatgrass, and smooth bromegrass, have their maximum production during the spring and early fall, when temperatures are cooler.

Warm-season grasses, such as blue grama and buffalograss, begin to grow later in the spring compared to cool season varieties, with maximum production during the midsummer months when temperatures are hot.

Many of the irrigated pastures in Colorado contain cool-season grasses such as tall fescue, orchard grass and smooth brome. These cool-season species are highly palatable to horses. A horse pasture can be productive for about 4-6 months of the growing season, depending on soil type, elevation, irrigation, and temperatures.

Dryland (Non-irrigated) Pastures

Horse owners may also keep their animals on pastures that are not irrigated. Under these conditions, forage production in our semi-arid climate is greatly reduced. There are both cool-season and warm-season grass species available for healthy pastures. Overgrazing easily damages warm-season grasses. All forage grasses become less palatable as the plants mature. This may result in selective grazing of the more desirable species and, consequently, overgrazing of the palatable species. Consult with your local CSU Extension office for site-specific advice.

Regardless of the type of pasture, follow the regenerative grazing practice of frequent rotation and long recovery periods for pastures/paddocks. Don't let your horses overgraze their pasture. It will take many months/years and a large investment to re-establish forage that has been overgrazed. Additional recommendations can be found in the Colorado **Forage Guide** (QR code).

Mowing

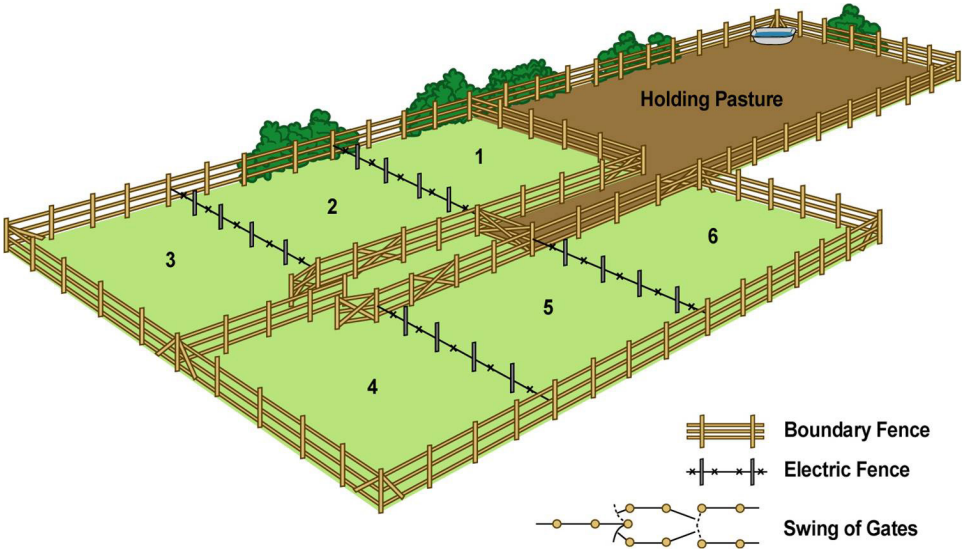
In some instances, periodic mowing may be beneficial, depending on your pasture. Mowing can stimulate desirable forage species growth and suppress weeds if done correctly. Setting your mower to the highest mowing setting can also enhance the appearance of your property. Consider Natural Resources Conservation Service (NRCS) **CRP Guidelines** when it comes to mowing, or reach out to your CSU Extension office for site-specific recommendations.

Grazing Management

Use observation and adaptive management for long-term pasture health. Overgrazing occurs by keeping horses on a pasture for too long, or not allowing proper time for grasses to regrow before grazing. The timing of grazing can have a long-term impact on pasture. Grazing too early in the spring can reduce the potential total yield of your pasture. Grass should be allowed to grow before horses are permitted to graze on it. The amount of growth will vary depending on the grass species; for example, smooth brome and orchard grass should be allowed to grow to a height of 6-8 inches before grazing is initiated. Other grasses may have different recommended height requirements prior to the initiation of grazing.

Take half and leave half. Grazing horses should not remove more than 50% of the available forage. If your horse has eaten 50% of the grass that was there before they started grazing, or if the grass is 3 inches tall or shorter, remove them and allow the pasture to rest until the grass grows to the original height (approximately 30-90 days, depending on moisture).

Rotational Grazing. Divide your pasture into grazing cells/paddocks to allow for rotational grazing practices. After a cell/paddock has been grazed, move the animals to a fresh cell while the grazed cell rests and regrows. Implementing rotational grazing can increase forage productivity and pasture health overall.



Noxious Weed Management
While not all noxious weeds are poisonous to horses, they can degrade your pasture in many ways. They compete with desirable forages such as grass and legumes for soil moisture, light and nutrients. Noxious weeds such as Canada thistle *(Cirsium arvense)*, leafy spurge *(Euphorbia esula)* and diffuse knapweed *(Centaurea diffusa)* must be managed based on both state noxious weed law and county/municipal ordinances.

To manage weeds properly, you must first be able to identify them. Then you can develop a weed management plan, and stick to it! Some weeds are easier to control than others. While some may require the application of an herbicide, others may be successfully managed using a variety of biological, cultural, and mechanical techniques. In Colorado, integrated weed management is the preferred approach. This means the planning and implementation of a coordinated program using a variety of methods for managing noxious weeds in order to promote desirable plant communities in a safe and economical way.

For free help in developing an integrated weed management plan for your property, contact your local noxious weed manager. A link to county contacts is provided in the References section.

REFERENCES AND RESOURCES:

CSU's Guide to Poisonous Plants:
www.poisonousplants.cvmbs.colostate.edu/search

Colorado Department of Agriculture Noxious Weeds:
www.colorado.gov/ag/weeds

Colorado Weed Management Association:
www.cwma.org

CSU Extension Offices:
www.extension.colostate.edu/field-offices/

Boulder County Horse Association:
www.boulderhorse.org

Colorado Horse Development Authority:
www.chda.org

Colorado Conservation Districts:
ag.colorado.gov/conservation/cscb

Colorado County Noxious Weed Contacts:
bit.ly/WeedManagers

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To order copies of this brochure, please contact the CDA Noxious Weed Program at weeds@state.co.us

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