

AGRICULTURE

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Extension programs are available to all without discrimination.

AG BUSINESS

Wheat Marketing Webinar Series Coming in February Brent Young, Regional ABM Specialist

Many agricultural producers don't feel confident in their abilities to market the commodities they produce. In today's agricultural business environment of high input costs and slim or non-existent margins, marketing skills are essential. In an effort to help wheat producers improve their marketing skills, CSU Extension Ag Economist, Dr. Brent Young and the Colorado Wheat Growers Association is offering a series of ag marketing webinars.

The Basic Ag Marketing Lunch and Learn – Wheat Producers Edition webinar series is meant to be a basic course covering the mechanics of cash, futures, and options markets with advanced sessions leading up to the development of a marketing plan. Participants will have the opportunity to participate in four additional webinar sessions throughout the marketing year.

The webinar format is interactive and will allow for live questions. Each webinar session will be recorded for review if you miss a session or for additional viewing to clarify concepts.

The webinars will be held from noon to 2pm, Tuesdays in February (7, 14, 21 & 28) and March (7 & 14). One fee covers all six sessions, \$50 for Colorado Wheat Growers Association (CWGA) members and \$100 for non-CWGA members. To register online go to <https://cowheatmarketing.eventbrite.com>. For more information contact Brent Young at 970-580-2204 or email at brent.young@colostate.edu

AGRONOMY

Wheat Stem Sawfly Ron Meyer, Area Agronomy Specialist

Wheat stem sawfly is a native insect that feeds on grasses in Colorado. The insect was first identified by entomologists in Colorado around the late 1800's and primarily fed on range grasses. However, wheat stem sawfly emerged as a Colorado wheat pest in 2010 and damage from this insect has been expanding and increasing since. Today, this pest is estimated to cause \$30 million in damage, according to Brad Erker, Executive Director of the Colorado Wheat Research Foundation. As a result, Colorado State University (CSU) is focused on addressing cropping strategies to ease pest losses to this insect. Research is focused on cropping rotations and developing wheat varieties that discourage wheat stem sawfly from reproducing and damaging plants.

CSU and others have found that wheat stems that are more solid than the traditional hollow stemmed varieties have shown merit in reducing the pest's damage. Typically, adult wheat stem sawfly lay eggs in the stem during the growing season. The developing larvae feed and move downward in the plant and eventually cut the plant's stem off near the soil surface. The wheat plant with seed in heads fall to the

ground and are un-harvestable. Thus, not only is yield impacted negatively, but straw residue is also now lying flat on the ground. The larvae survive in the remaining stem near the soil surface.

Cropping strategies include shallow tillage that lifts wheat crowns and loosens soil. This activity exposes larvae to winter weather and increases mortality during some winters. However, tillage interferes with biological control insects (insects that feed on sawfly) and may increase soil erosion. Keep in mind that the advantages of controlling sawfly with tillage must be compared to the benefits of leaving residue on tops of fields.

Another strategy for tolerating wheat stem sawfly is to swath wheat early. Swathing wheat at 25-30% moisture allows wheat to reach physiologic maturity and permits harvest before sawfly cuts plants off. This strategy necessitates the use of a swather to windrow wheat, allowing grain to dry in the swath, before stem cutting has occurred. Swathing before grain is 30% moisture, will cause test weights to drop as plants are still filling grain. Wheat stem sawfly will still cut stems after swathing, but losses to yield will be reduced as grain will remain harvestable in the swath.

Planting trap crops along field edges has shown promise in research trials. Wheat stem sawfly will deposit eggs in oats, barley, and rye and developing larvae will not survive in these crops. Trap crop strategy works best with low to moderate wheat stem sawfly populations. If populations are heavy, adults will continue to fly past the trap crop and into wheat fields. Also, avoid planting new wheat next to a previous field that contained wheat with sawfly populations. Adults emerge from the old wheat stubble in the spring and move into actively growing wheat. Adult wheat stem sawfly are not strong flyers and do not move long distances.

Although new chemistry is being tested and until promising results dictate, applying insecticides has not been an effective strategy for this pest. Adults have an extended flight time during the growing season and repeated insecticidal applications in trials have not been cost effective for control. Keep in mind that new insecticidal application strategies are being investigated.

One of the most effective strategies for reducing wheat stem sawfly damage is planting solid stemmed wheat varieties. Larvae trying to feed and develop in solid stemmed wheat varieties have higher mortality rates. CSU is currently incorporating solid-stem characteristics into existing wheat varieties and has released Fortify SF and Amplify SF. Other wheat stem sawfly varieties include AP Solid, Spur, WB4483, WB 4418, WB4595, and WB4792. For more information regarding local wheat variety availability, contact your local wheat seed dealer.

Agricultural Census

Ron Meyer, Area Agronomy Agent

Taken every five years, the Agricultural Census is a complete count of America's farms and ranches. The Census provides extremely valuable information used at the local, state, and national levels to plan for the future. Information submitted to the Census is used for statistical purposes only in accordance with federal law as responses are kept confidential and will not be disclosed in identifiable form.

The Census provides comprehensive agricultural data for every county and state in the nation. Census results will play a role in determining future decisions about agricultural research, beginning farmers programs, conservation programs, new agricultural technologies, production practices, rural economic development, broadband expansion needs, and future federal farm bills.

The United States Department of Agriculture will begin collecting information in November of 2022. Responses can be mailed (questionnaires will be mailed to all farm entities) in a prepaid envelope provided or can be filled out online at www.agcounts.usda.gov. Reporting will provide an opportunity for agriculture to tell how American agriculture provides food, fuel, feed, and fiber to city cousins who may not know anything about agricultural production.

Crop and Soil Considerations when Grazing Corn Stalks

Kat Caswell, Area Agronomy Specialist

Grazing corn stalks in the fall and winter is an excellent way of integrating livestock onto cropland. Research from UNL has shown that grazing corn stover has no immediate impact on the following crop yield in a typical year. Corn stover provides an alternative source of forage for cattle, and an additional source of income from fields that would otherwise be dormant in the winter. Grazing livestock does not remove the total amount of nutrients from the field that baling stover does, as a portion of the nutrients consumed during grazing are returned to the field through manure. Nor does grazing remove the same amount of corn residue that baling does. While grazing corn stover can be beneficial, there are some important considerations to keep in mind.

For general soil conservation, at least 50% ground cover should be left after grazing. With the high price of feedstuffs, there might be the temptation to graze as much as possible from corn stalks this winter. While there may be no impact on next year's crop, over time the greater removal of corn residue will decrease soil carbon and impact soil quality. Avoid heavily grazing areas where soil is already prone to erosion. One year of heavy grazing on easily eroded soils can decrease the amount of time it takes for water run-off to occur, increasing the risk of both soil and nutrient loss from the field. After several years of drought, unusually high winds, and short but intense storms, preventing soil erosion should be a concern.

As with pasture or rangeland management, determining an appropriate stocking rate is important. The amount of grazable forage (stalks, leaves, husk, and cob) after corn harvest is directly related to the amount of harvested grain. In fields where corn yields have been decreased due to drought, there will be less forage available for grazing this year. UNL Extension has a Corn Stalk Grazing Calculator available to assist in determining the stocking rates for your corn residue (see below for link and website directions).

The concentration of nitrates are highest in the lower third of the corn stalk. Stalks are generally not the first forage cattle graze but leaving animals to graze for a longer period this year may lead animals to consuming toxic levels of nitrates. Nitrate toxicity is a higher risk in dryland fields than in irrigated fields. Corn stalks on the edge of irrigated fields may have higher nitrate content than the rest of the field.

For example, a field that typically produces 100 bu/acre of corn would produce around 1,600 lb of dry matter per acre, meaning there is 830 lb. of dry matter available for grazing. If a 1,000 lb. animal eats roughly 26 lb. of forage a day, there would be approximately 30 days of grazing available. If the corn yield was only 50 bu/acre, the available grazing period for the same animal is now 15 days. Grazing that field with the same 30-day period as you would have in the past, will remove a greater amount of residue and increase the likelihood of soil erosion.

Previous studies have shown that there is little impact of grazing on soil compaction. When compaction did occur, it did not reach levels where plant root growth would be impeded, nor did the last through the following year. If compaction around a single area is a concern, try rotating the location of supplemental feed and minerals to encourage animal movement.

In conclusion, grazing corn stalks can benefit both cropland and cattle. Following lower corn yields due to drought, adjust the grazing period length, stocking rate, or amount of supplemented feed to reduce the risk of soil erosion, nutrient loss, and nitrate toxicity. While one year of heavy grazing may not impact the following crop's yields, be aware of the risk that water erosion and residue loss can have on future field management.

For more information on UNL Extension's Corn Stalk Grazing Calculator

1. <https://beef.unl.edu/learning/cornstalkgrazingcalc.shtml>
2. Go to beef.unl.edu → Educational Resources → Learning Modules → Feeding and Nutrition Management → Corn Stalk Grazing Calculator

CSU Cowpea Production Webinar **Sally Jones-Diamond, Research Associate Crop Testing**

The Colorado State University (CSU) Crops Testing Program and CSU Extension are inviting producers to a Cowpea (black-eyed pea) Production Webinar. The free webinar will be live online on Thursday, January 19th from 9-10:30 a.m. hosted on Zoom. This meeting will offer agronomic and marketing insights into this drought-tolerant and low water use crop.

CSU Extension Specialist Sally Jones-Diamond will present the CSU cowpea variety trial results from 2022. Joel Schneekloth, CSU Extension Water Resources Specialist, will talk about water-use of cowpea under different irrigation regimes. Courtney Schuler from Trinidad-Benham and Don Pope from Farmer Bean and Seed will talk about agronomics and current markets.

To register and receive a Zoom meetinglink or for more information, please email Sally at sally.jones@colostate.edu.

Private Pesticide Recertification **Ron Meyer, Area Agronomy Agent**

Colorado State University Extension is hosting Private Pesticide Recertification sessions at various locations in Northeast Colorado. Anyone who purchases restricted-use pesticides must have a Private Pesticide Applicator license which is issued by the Colorado Department of Agriculture. Private Applicator license study guides and exams can be obtained either from the Colorado Department of Agriculture or some Extension offices. Once a license is received, it is active for 3 years before renewal is needed. Renewal can be achieved by either retaking the exam or attending a recertification meeting. These recertification meetings offer seven core credits which can be substituted for retaking the exam.

Private pesticide recertification sessions will be held on March 20, 21, and 22, 2023. On Monday March 20 the program will be held in Akron at the Colorado State University Extension office beginning at 9 am and will last until noon. The March 21 meeting will be held at the Julesburg Courthouse Annex and

will begin at 9 am and conclude at noon. The March 22 meeting will be held at the Burlington Community Center and will begin at 9 am and will conclude at noon. Cost will be \$50 per person.

Registrations will be taken early in 2023. Watch for additional advertisements. For more information contact Ron Meyer (7193491101) or at rf.meyer@colostate.edu.

LIVESTOCK

Toxic Forage: Nitrate and Prussic Acid Toxicity **Scott Stinnett, Livestock and 4-H Youth Development**

With extremely dry conditions and having the first real frost this week, producers are looking at all the possible available forages to feed their cattle. But they need to be careful as the conditions are right for nitrate and prussic acid toxicity in forages. Both can be deadly to cattle.

Nitrate toxicity appears in forages who have absorbed nitrogen and then become stressed due to conditions such as drought, hail damage and frost damage. Nitrate toxicity happens when the plant was growing and absorbing nitrogen through the roots. As the nitrogen is moving up the stems or in the leaves, the plants become stressed from conditions such as drought, frost or freezing. Nitrogen in the form of nitrates, then becomes trapped in the plants and not synthesized into the carbohydrates as normal. The plants now have toxic levels of nitrate. Nitrate poisoning then occurs when cattle eat forages high in nitrate and it turns into nitrite in the rumen. Nitrite bonds with hemoglobin in the blood and limits the capacity to carry oxygen. High enough levels of nitrite lead to low blood oxygen and animals succumb to oxygen deprivation. Signs of animals with nitrate poisoning may include stumbling, rapid pulse, labored breathing and frequent urination then collapse, coma and death. Plants known for having high nitrates include sorghum-sudangrass, oats, wheat, rye, barley and millet. Some perennial grasses like fescue and johnsongrass, as well as weeds including pigweed, kochia, mustard, nightshade and lamb's quarters can have high nitrate levels.

Prussic acid toxicity, also called hydrocyanic acid, is similar. Like nitrate toxicity, some plants can accumulate cyanogenetic glycoside in the plant and when the plant becomes stressed, the glycoside degrades. This releases high levels of hydrocyanic acid in the plant making it toxic. When ingested, the hydrocyanic acid then interferes with the release of oxygen from oxyhemoglobin to body cells. Again, animals succumb to oxygen deprivation. Once a lethal amount is ingested, prussic acid poisoning is very rapid. Symptoms include excitement, muscle tremors, rapid and difficult breathing followed by the animal going down, gasping for breath and may convulse before finally asphyxiating. These symptoms occur so quickly most producers only find the deceased animal. In Colorado, plants known for possible prussic acid toxicity are sorghum-sudangrass, white clover, vetch seed and chokecherry.

Fortunately, there are qualitative tests to evaluate forages (hay, pasture, and silage) for prussic acid and nitrate toxicity. These tests take less than 10 minutes to complete and can determine if there is a presence of prussic acid or elevated nitrates. Prussic acid and nitrate qualitative tests can be completed at some Colorado State University (CSU) Extension offices. If tested forages do indicate the presence of either of these, a sample can be sent to a qualified lab for further testing to determine the levels of

prussic acid or nitrates. If you are concerned about the possibility of prussic acid or nitrate toxicity, contact your county CSU Extension office for more information and to see if testing is available.

References:

Whittier, J.C. (2011) *Nitrate Poisoning*. [Fact Sheet No. 1.610]. Colorado State University Extension. <https://extension.colostate.edu/topic-areas/agriculture/nitrate-poisoning-1-610/>

Whittier, J.C. (2011) *Prussic Acid Poisoning*. [Fact Sheet No. 1.612]. Colorado State University Extension. <https://extension.colostate.edu/topic-areas/agriculture/prussic-acid-poisoning-1-612/>

Hay Waste Is Money on the Ground **Scott Stinnett, Livestock and 4-H Youth Development**

With the current cost of feeds including hays, combatting waste is a good way to save some money. There are several shapes and sizes of hay from small square bales, rounds bales to large square bales. Each has its unique advantages and disadvantages. Producers with a few animals, horses and those with smaller livestock like sheep and goats may find small squares the best for them. Cattle producers with large groups to feed may find round bales the best fit. Large squares may best fit drylot and feedlot situations where large bales can be processed and mixed with other feeds. No matter which you use, there is usually some waste. There are two big considerations for addressing hay waste, hay storage and feeding.

Storage of hay to prevent waste starts with protecting hay from the environment, specifically from moisture. Most of the time we focus on moisture in the form of precipitation like rain and snow. We know hay acts like a sponge and even the tightest bales can absorb moisture, and this can promote mold, fungus and rot to degrade the hay quality and quantity. But do you consider moisture from the ground or from the bales themselves?

Many round and large square bales are stacked on the ground in a hay lot. They may or may not be tarped or even under roof but examining these bales, we can usually find some mold or rot on the bottom where the bales contacted the bare ground. Even in areas we consider very dry and well drained, condensation can occur, and the bottom of the bales will absorb moisture. There is not much that can be done, but if hay can be stored on ground that drains away from the stack, it can lessen the moisture in the ground. A producer should not stack hay in a low spot that water flows to or puddles in. For example, if you are lucky enough to have a section of abandoned roadway on your property, it is a great stack location as roads are normally built to be crowned in the middle for drainage.

For small square users, ground condensation can still be a factor even though most small squares are stored inside. Consider using old pallets to stack hay on. It keeps bales off the ground and allows airflow underneath to keep the bottoms dry.

Protection from precipitation is the usual focus and a very valid one. Consider a common 5 ½ foot diameter round bale. The outer 6 inches of the bale is equivalent to 33% (one third) of the total hay in the bale.¹ A bale that weighs 1200 lbs. means 396 lbs. of hay is in the outer 6 inches. A 1500 lbs. cow who needs 3% of forage per day could eat on that outer 6 inches for 8.8 days assuming no waste. Stacking and properly tarping hay can protect it from rain and snow, but caution should be used as some tarps can trap moisture creating condensation that can have the same damaging effect as rain or snow.

Feeding hay creates another chance for waste. Hay can be fed in a variety of ways. The most wasteful is directly on the ground. Livestock tend to eat and walk on hay on the ground and can waste as much as 40% of the hay.² Put that into a current value. If the hay is valued at \$200 per ton, a 1200 lbs. round bale is worth \$120 and therefore 40% or \$48 is wasted on the ground.

Using a feeder is the best option for feeding hay, but some feeders are better than others. A ring feeder without a solid bottom can waste up to 20% of the hay. Adding a solid bottom to a ring feeder can reduce loss to 12 or 13%. The best feeders are the cone style which can bring hay waste down to under 6%.² The problem with most cone feeders is having the equipment that can lift a bale up into the top of the cone feeder where the ring feeders can be set over a bale on the ground.

The cost of purchasing the lower waste feeders may seem high compared to other feeders, but putting pencil to paper, the money saved in hay waste will pay for the better feeder in just one winter. Using the earlier example of the 1200 lbs. round bale, reducing waste from 20% with an open bottom ring feeder to 12% with a solid bottom ring feeder saves 8%. At \$200 per ton hay cost, which is a savings of \$9.60 per bale or \$16 per ton. If you are feeding a bale per day over 150 days, that equates to \$1440 in savings.

There are better hay feeder choices for horses and small livestock as well. Horse owners should consider net style feeders or ground feeders that have a net or grid covering to slow the amount of hay a horse can pull from the feeder. There are several small livestock feeders designs similar to cattle hay feeders and horse feeders. Choosing one that allows small amounts of hay to be removed at a time will help to limit the waste.

References

¹Wells, R. & Lalman, D. (2018) Hay feeder design can reduce hay waste and cost. Noble Foundation Ag News and Views. <https://www.noble.org/news/publications/ag-news-and-views/2013/november/hay-feeder-design-can-reduce-hay-waste-and-cost/>

²Moore, & Sexten, W. J. (2015). Effect of bale feeder and forage on hay waste, disappearance, and sorting. *The Professional Animal Scientist*, 31(3), 248–254. <https://doi.org/10.15232/pas.2014-1365>

Vitamin A Deficiency in Beef Cattle **Travis Taylor, Area Livestock Specialist**

Vitamin A is necessary for growth, vision, maintenance of epithelial tissue and mucous membranes, bone development, glucose synthesis and immune function in livestock. It is one of four fat soluble vitamins, the others being D, E, and K, that beef cows obtain from green grass or good quality hay. In drought stricken years cows can easily be short of this important vitamin. Fat soluble vitamins absorbed in the intestinal tract are required for metabolism of structural units and can be stored in the liver and fat tissues. Vitamins A, D, and E cannot be directly synthesized in the rumen and are required in the actual diet. Quality forages actually contain large amounts of vitamin A, or rather a precursor called carotene that the ruminant animal can convert to vitamin A. Carotene rich feed sources are green leafy forages or pastures, hays/silages, dehydrated alfalfa meal, yellow corn, whole milk and fats such as fish oils.

Unfortunately, vitamin A is the least stable vitamin needed in livestock diets. It is readily oxidized in hays and forages during storage. Heat and light also drastically reduce availability. High dietary fat or mineral levels can destroy or tie-up vitamin A and other antagonistic factors, like excess or deficient amounts of another nutrient, may impair absorption. Degradation in forage is variable, yet a conservative rule of thumb is that the available beta-carotene declines by about 30-50 percent each year a forage is stored. Thus, vitamin A in two year old hay would be approaching zero availability.

Vitamin A deficiencies in beef cows can be correlated to many production and reproductive problems. Common deficiency signs include reduced feed intake and growth, rough hair coat, night blindness, edema, diarrhea, and even seizures. Other production pitfalls are seen as increased susceptibility to infection, retained placentas, abnormal bone growth, and low conception rates. Bulls also need adequate vitamin A in their diet, as deficiency can affect sperm development, thereby increasing the chances of low conception rates. At calving time deficiency may manifest as increased abortions, stillbirths, and weak calves. Calves a cow with very low Vitamin A may be born blind..

Livestock vitamin requirements are commonly expressed in International Units (IU). In cattle, sheep, goats and horses, one milligram of beta-carotene in feedstuffs equals approximately 400 IU of vitamin A. The daily requirements for beef cattle appear to be ~5 mg of carotene or 2,000 IU of vitamin A for every 100 lb. body weight; lactating cows may require twice this amount to maintain high vitamin levels in the milk. It is a fact that mature cows can store vitamin A in their livers for up to 4 months under plentiful conditions. Even so, it's during times of stress that vitamin A requirements increase to facilitate the functioning immune system. When there is prolonged drought or an extended period that cattle are fed less than desirable forages or stored hay that these levels rapidly deplete and supplementation may be required to maintain proper health and cow reproductive performance as well as the normal calf development and health. Drought conditions will decrease the amount of carotene in plants limiting the ability for cows to accumulate liver stores during grazing. Additionally, harvested forage during a drought will have extremely low carotene levels decreasing the ability of cows to consume their requirements during the winter feeding. Another complicating factor is that many drought stressed forages have elevated nitrate levels. High nitrate levels are thought to lead to destruction of carotene and Vitamin A in the digestive tract and increasing requirements for Vitamin A by depressing thyroid function.

Late pregnant cows and heifers would benefit from being supplemented if subjected to drought conditions, fed poor quality forage such as corn stalks, weather damaged hay, or with minimal green grass intake during the year. Supplements can be in liquid supplements mixed with feed or added to salt. It can also be administered via injection, but Vitamin A supplementation, like other vitamins or minerals, when overdone can cause antagonistic interactions with other nutrients in the diet. It is also important to remember that cows and calves that are deficient in Vitamin A are probably deficient in Vitamin E, copper, manganese, selenium and zinc. There are numerous and definite interactions that can occur quickly when dealing with vitamin and mineral interactions. The symptoms from toxic versus deficient levels can be similar, and is the case with vitamin A. If you suspect vitamin A trouble, it might be prudent to have a diagnostic analysis done that includes liver mineral and vitamin levels. With such information and veterinary consultation, managers can determine a cost effectively supplementation plan to provide cattle the necessary vitamins and minerals to help ensure a healthy beef cow, bull, and calf.

Prepare for Calving Season

Scott Stinnett, Livestock and 4-H Youth Development

Preparing for calving season usually comes during an already busy time of the year. No matter if you calve in winter, spring or fall, gathering all the items needed for a successful calving season is a bit daunting. Here are some things to keep in mind as you prepare for calving season.

Contact your veterinarian. Review with them your herd health plan for the calving season and let them know when your calving season should start and how long it may last. Work with them to determine any pre-calving vaccinations of bred females and ordering any medications to have on hand for calving season. Be sure and get an after-hours contact number for your veterinarian or their clinic in case you have an emergency during calving.

Arranging calving season labor should not be a last-minute task. If your operation is large and you have several employees, or it is a family operation encompassing multiple households, it is a good idea to start working out the cow checking schedule. A common rule of thumb is a check every 3 hours depending on weather. Make sure contact numbers are known by everyone in case of emergency including your veterinarian's number. Also educate anyone who is new to working calving season on the stages of calving and signs of dystocia.

Cow calf operations vary widely in the types of calving facilities that are used. Some use calving pastures close to home or ranch headquarters while others have specific calving lots or paddocks and utilize sheds and calving pens. No matter the facilities, all need some attention to certain things. Make sure the area is clean. Dispose of any old feed. Remove old manure. This can be done by physical removal in calving barns, sheds and small lot or using a means of mechanical breakdown like dragging a chain harrow across paddocks and pastures to break manure down into smaller pieces. Removing trash and hazards from the calving areas to prevent injuries to cows and calves. Repair fences and facilities to good working order. Ensure proper drainage around buildings, wind breaks and calving areas. Check that all head catches, working alley and chute gates are in working order. Check all lighting both inside and outside of calving facilities. Test warming boxes, huts or rooms to make sure they will work prior to being needed. Have on hand an extra supply of supplemental feed and bedding in case of inclement weather.

Calving supplies should be gathered in a central location to make them easy to find for anyone during a calving emergency. Such supplies may include: OB sleeves, OB lube, OB chains or straps, calf puller, sanitizing solution (ex. chlorhexidine), navel dip, esophageal "stomach tube" feeder, colostrum or colostrum replacer, calf bottles, milk replacer, flashlights with fresh batteries or spotlights with good charging or power cords, ropes and halters, calf sled or calf carrier of some type, ear tagger and tags, and straw or other bedding on hand.

Record keeping is an important part of calving season. Be sure to have those record keeping items gathered whether it be a classic "red book" or notebook with pens. Some operations are using tablets and smart phones with record keeping applications loaded on them to keep an electronic record.

Being prepared for calving season just make sense. It makes handling those typical calving season problems easier and may help prevent some others.

Horticulture

Relentless Gardener Pod Cast **Linda Langelo, Area Horticulture Agent**

As a gardener in Colorado, are you relentless in your efforts? Want to know how to improve as a gardener? Tune-in on Spotify and listen to our horticultural topics. Topics that have been published throughout 2022:

Wasps: With guest, CSU Horticulture Agent Lisa Mason from Arapahoe County.

Turf Renovation: With guest, CSU Turf Specialist Tony Koski.

Turf Problems: With guest, CSU Turf Specialist Tony Koski.

Spotted Lantern Fly: Guest, CSU Horticulture Agent Lisa Mason from Arapahoe County.

Pollinator Habitats: With guest, CSU Horticulture Agent Lisa Mason from Arapahoe County.

Native Bee Watch: With guest, CSU Horticulture Agent Lisa Mason from Arapahoe County.

Japanese Beetles: With guest, CSU Horticulture Agent Lisa Mason from Arapahoe County.

Emerald Ash Borer: With guest, CSU Horticulture Agent Lisa Mason from Arapahoe County.

Beneficial Insects: With guest, CSU Horticulture Agent Lisa Mason from Arapahoe County.

High and Dry Gardens: With guest, CSU San Miguel Basin Extension Director Yvette Henson.

Seed Libraries: With guest, CSU San Miguel Basin Extension Director/Horticulture Yvette Henson.

Benefits of Trees: With guest, CSU Horticulture Agent Alison O'Conner from Larimer County.

Caring for Your New Tree: Guest CSU Horticulture Agent Alison O'Connor from Larimer County.

Choosing the Best Spot for Your Tree: Guest, CSU Horticulture Agent Alison O'Connor.

Tips for Tree Selection in Colorado: Guest, CSU Horticulture Agent Alison O'Connor.

Grow & Give: Past Results: Guest, CSU Statewide Master Gardener Coordinator Katie Dunker.

Grow & Give What Does Grow & Give Have to Offer: Guest, Katie Dunker.

Grow and Give: How Did Grow and Give Start: Guest, Katie Dunker.

Future topics coming soon on the Sustainable for Life Program, Cut Flowers, Fruit Trees, Season Extension Trials, The Ute Garden, Cool Season Crops and much more. Stay tuned.

Growing Under Walnuts

Linda Langelo, Area Horticulture Specialist

Why does a walnut tree produce a plant toxic chemical called juglone or hydrox juglone? This is a naturally occurring chemical that is a defense mechanism protecting the walnut tree from surrounding plants. What happens to the surrounding plants? It stunts the growth of surrounding plants as Juglone inhibits plant respiration. If there are sensitive plants under a walnut, juglone will deprive these plants of water and nutrient uptake. Symptoms such as wilting or yellowing leaves occur.

Juglone is not soluble in water. Consequently, it does not move very far in the soil. If sensitive plants are under the walnut and the ground is compact, it will succumb to this juglone toxin. If the soil were well-drained and had good organic matter any sensitive plant will fare better. This chemical can persist for years after a walnut is removed, and if you find a lot of plants cannot grow in a particular location, then ask the previous homeowners if there was a walnut tree there. If there were no walnut trees, then test the soil for nutrient value and pH.

The term allelopathy means one plant inhibits another from growing. This happens from the roots of the walnut touching the roots of other plants. This toxin (juglone) can also stop any seed germination. Walnuts are not alone in the production of juglone. According to Penn State Extension, English or Persian walnut (*J. regia*) and hickories (*Carya*) produce juglone but to a lesser degree.

So, what plants can survive under a walnut? Below is a brief list:

Herbaceous Perennials: Yarrow, Hosta, Bugleweed, Hollyhock, Iris spp., Aster, Mums & Daffodils

Vines: Clematis, Virginia Creeper, Wisteria

Shrubs: Barberry, Forsythia, Rose of Sharon, Juniper, Elderberry

Vegetables: Onion, Beets, Squash and Melons, Carrots, Beans, Parsnips and Corn.

Reference and full list of Juglone Tolerant Plants can be located at the following link:

<https://extension.psu.edu/landscaping-and-gardening-around-walnuts-and-other-juglone-producing-plants>