



EXTENSION

Impact of Cold Temperatures on Warm-Season Perennial Grasses Mike Trammell, Pottawatomie County Agriculture Educator

Warm-season perennial grasses are the basis of pasture systems and livestock production in eastern Oklahoma. The most prominent warm-season species are Bermudagrass (seeded and hybrid) and Bahiagrass. However, they can go dormant from the first killing frost in the fall (early to mid-November) to the green-up stage in the spring (early to mid-April). Although they are more adapted to low fertility soils than other species, they can be greatly impacted by cold winter temperatures. Some varieties of Bermuda and Bahiagrass vary a lot in their tolerance of growing conditions which is usually referred to as plant hardiness. Hardiness is based on the ability of the plant to tolerate cold, heat, drought, flooding, wind, and other environmental conditions. Hardiness is also defined by the geographic location based on longitude, latitude, and elevation. The most common use of this term is based on cold or winter hardiness. Cold hardiness is measured by the lowest temperature a plant can withstand and survive. By using these parameters, 10-degree F hardiness (Continued Pg. 3)

North American Live Cattle Trade Evolving Derrell S. Peel, OSU Extension Livestock Marketing Specialist

Live cattle trade between the U.S., Mexico and Canada has changed significantly in recent years. For the first ten months of the year, total U.S. cattle imports from Mexico are down 23.4 percent year over year, following a decrease of 32.4 percent in October compared to last year. Cattle imports from Canada are down 9.0 percent for the year-to-date compared to last year but were up 9.2 percent year over year in the month of October. Total cattle imports are down 18.7 percent year over year through October with the one-month total down 18.5 percent.

Exports of U.S. cattle to Mexico and Canada have increased in the last four years. Cattle exports to Canada, in particular, have expanded significantly, with exports up 70.7 percent year over year for the January to October period. Thus far in 2021, cattle exports to Canada are 69.4 percent of cattle imports resulting in net cattle imports from Canada down 55.8 percent year over year. Cattle exports to Mexico remain small relative to the level of cattle imports from Mexico but have also increased in recent years. Cattle exports to Mexico for the year-to-date are up 215.2 percent and are 7.5 percent of cattle imports from Mexico. In total, cattle exports so far in 2021 are up 81.2 percent year over year, equal to 31.3 percent of imports, and contributing to a 35.0 percent decrease in net cattle imports for the first ten months of the year.

Cattle imports from Canada include a mix of cattle for immediate slaughter as well as feeder cattle. For the year-to-date, total slaughter cattle imports from Canada are down 10.2 percent. Slaughter cattle imports consist of fed cattle (steers and heifers) that are 43.1 percent of (Continued Pg. 5)

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Figure 1. The image on the left is a 1,300-pound bale placed in an “open” steel ring hay feeder. The image on the right is the same bale and feeder after twelve cows had access to the bale for 24 hours.

Hay Feeder Design to Reduce Hay Waste

David Lalman, OSU Extension Beef Cattle Specialist

Hay production in the Southern Great Plains has steadily increased over the last 50 years. Even though minimizing use of harvested forage would reduce cost of production and carbon footprint in most situations, it is a fact that the haying industry remains an enormous component in the Southern Great Plains agricultural landscape. Therefore, improving hay feeding efficiency represents “low-hanging fruit” in many seedstock and commercial operations.

Feeding strategies for large round bales can basically be separated into use of a hay feeder and rolling bales out. A major advantage to rolling bales out is improved distribution of hay waste and manure over the pasture, which should lead to improved soil fertility. Hoof action is also distributed over a larger feeding

area, and this could lead to less soil compaction and (or) less sod/plant damage compared to concentrated feeding areas associated with hay feeders. The disadvantage to relying on unrolling hay is the need to feed every day if standing forage availability is limited. Hay waste is basically a function of the amount of hay provided per animal each day. The more restricted the amount of hay fed, the lower the waste and visa versa. If two or more days’ worth of hay must be fed at a time, expect hay waste to exceed 25% of the original bale weight. The term “waste” may be considered a matter of perspective, because the “wasted” hay does provide soil nutrients and organic matter to the system.

Several studies have investigated the influence of hay feeder design on the efficiency of

hay utilization and hay waste. The lightweight (and therefore convenient), simple hay ring feeders remain popular for round bale feeding. However, the low original cost and light construction come at the expense of hay feeding efficiency. Researchers have consistently documented 19 to 21% waste, expressed as a percentage of the original bale weight, when these “open” feeders were used (Figure 1). Waste from feeding dry, long-stem grass hay can be reduced to about 12 to 13% simply by purchasing a feeder with a solid sheeted bottom. Finally, in four different experiments, feeders that combine a sheeted bottom feature with some type of a basket or cone mechanism have documented waste of dry grass hay between 3.5 to 8% of the original bale weight.

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Cold Temperatures (Continued)

zones has been established across the USA by the US Department of Agriculture (USDA) and at a more defined level within the state. Bermudagrass and Bahiagrass grow best when soil temperatures are above 70 °F. These temperatures usually occur when daytime air temperature reaches approximately 80 °F. Night temperatures are usually a good indicator of soil surface temperatures. Keep in mind that soil temperatures can be affected by soil color, surface residue, water content, etc. Warm-season grasses will not produce roots (rhizomes and stolons) unless the soil temperature exceeds 55 °F for several weeks.

This is the stage usually known as dormancy. As day length becomes shorter and temperature drop below 50 °F, Bermudagrass and Bahiagrass cease shoot growth, lose chlorophyll, and begin nutrient translocation (carbohydrates, nitrogen, potassium and phosphorous) for storage in the below ground tissue (rhizomes). Without proper plant nutrition, even the most winter hardy variety can succumb to winter kill or injury. Injured plants are slow to recover in the spring and after every grazing cycle or cut of hay.

Yield will always be limited by winter kill or injury, and stands will begin to thin as injured plants eventually die out. This can be costly over the long-term when producers are forced to renovate their pastures or hay fields. Most of the winterkill in warm-season perennial grasses, especially Bermudagrass, is related to poor soil fertility. Nutrient deficient plants are more susceptible to disease, regrow more slowly, yield less, and die off more quickly. The most common fertility issues associated with stand losses due to winter kill include low pH, low potassium (K) and low phosphorus (P). Low pH can restrict root mass development deeper in the soil profile and restrict root mass for nutrient translocation and storage. Bahiagrass and bermudagrass plants that are growing under optimum pH tend to have deeper growing, more dense rhizomes which escape low temperature damage by being better insulated in the deeper soil profile. Soil sampling to determine pH and nutrient levels is important in developing a management program for forage production, especially if a soil test has not been done within the past three years.

Late nitrogen (N) management, especially when overseeding annual ryegrass into a perennial warm-season grass sod, can impact the warm-season grass stand by maintain them active. If N needs to be applied to annual ryegrass in this case, wait until bermudagrass or Bahiagrass is dormant. It is not recommended to apply N to warm-season grasses late in the season (30 to 45 days before frost) because excessive N levels during the late-season may deplete nutrients stored in rhizomes as shoots compete for plant reserves. Late N applications increase tissue hydration, stimulates new growth, producing tissues that have thin cells and are more susceptible to winter kill or injury. Minimizing N movement to new leaves may increase nitrate assimilation in the roots and increase translocation of additional nutrients (P and K) for storage in the belowground tissues. Nitrogen may also stimulate root growth as nitrate directs carbohydrates for amino acid synthesis and storage.

(Continued Pg. 5)

UPCOMING EVENTS and DATES

January 6th – Kay County Master Gardener Monthly Meeting
9:30a.m.

Cann Memorial Gardens
Ponca City, OK

February 14th-18th – Kay County Carcass Contest
Tonkawa Meats

February 21st-25th – 2022 Kay County Junior Livestock Show
Blackwell Fairgrounds

Monday, February 21st – Sheep and Goat Show

Tuesday, February 22nd – Swine Show

Wednesday, February 23rd – Cattle Show and Fitting Contests

Friday, February 25th – Awards Banquet and Dance



GARDEN TIPS FOR DECEMBER!

David Hillock, State Master Gardener Coordinator

Lawn & Turf

- Remove leaves from cool-season grasses or mow with a mulching mower. ([HLA-6420](#))
- Continue mowing cool-season lawns on a regular basis. ([HLA-6420](#))
- Continue to control broadleaf weeds in well-established warm- or cool-season lawns with a post-emergent broadleaf weed killer. ([HLA-6421](#))

Tree & Shrubs

- Select a freshly cut Christmas tree. Make a new cut prior to placing in tree stand. Add water daily.
- Live Christmas trees are a wise investment, as they become permanent additions to the landscape after the holidays.
- Light pruning of evergreens can be used for holiday decorations. Be careful with sap that can mar surfaces.

Flowers

- Apply winter mulch to protect rose bush bud unions and other perennials. Wait until after several early freezes or you will give insects a good place to winter.
- Poinsettias must have at least six hours of bright, indirect light daily. Keep plants away from drafts. ([HLA-6413](#))
- Watch for and control pests on indoor houseplants. ([HLA-6411](#))
- Make sure indoor plants are receiving enough light or set up an indoor fluorescent plant light. ([HLA-6411](#))

Fruits & Nuts

- Cover strawberry plants with a mulch about 3-4 inches thick if plants are prone to winter injury. ([HLA-6214](#))
- Wait to prune fruit trees until late February or March. ([HLA-6228](#))

General

- Keep all plants watered during dry conditions even though some may be dormant. Irrigate all plantings at least 24 hours before hard-freezing weather if soil is dry. ([HLA-6404](#))
- Order gardening supplies for next season.
- Now is a great time to design and make structural improvements in your garden and landscape. ([HLA-6425](#), [HLA-6440](#), [HLA-6441](#))
- Send for mail-order catalogs if you are not already on their mailing lists.
- Christmas gift ideas for the gardener might include tools, garden books, magazine subscriptions or membership to The Botanic Garden at OSU. (<http://botanicgarden.okstate.edu>).
- Clean and fill bird feeders.
- Till garden plots without a cover crop to further expose garden pests to harsh winter conditions.
- Visit your county extension office to obtain gardening fact sheets for the new gardening season.
- Join a horticulture, plant or urban forestry society and support community “greening” or “beautification” projects.
- Review your garden records so you can correct past mistakes. Purchase a new gardening journal or calendar to keep the New Year’s gardening records.

North American Live Cattle Trade Evolving (Continued)

total cattle imports plus slaughter cows and bulls that represent 33.9 percent of total imports. Imports of feeder cattle from Canada represent 21.6 percent of total cattle imports and are down 3.7 percent thus far in 2021 compared to last year.

Decreased net cattle imports are adding to declining cattle inventories in the U.S. and generally tighter cattle numbers at the end of the year. Numerous factors, both short term and long term, are affecting the development of live cattle trade in North America. Structural development in cattle feeding and packing in Canada and Mexico, along with drought conditions, feed supplies and prices and exchange rates all contribute to currently observed live cattle trade. Some of the current trends may not persist or may change but the overall live cattle market between the U.S., Mexico and Canada will continue to evolve.

Hay Feeder Design to Reduce Hay Waste (Continued)

Efficient hay feeders generally restrict access to the top half of the bale. This limits cows' ability to drag hay from the top of the bale directly onto the pen or pasture surface. Next, the basket or cone mechanism serves to hold the bale in the center of the feeder until it collapses below the basket. Finally, the basket mechanism creates a feeding space inside the feeder so that the cows are not constantly entering and exiting the feeder, dropping hay on the pen or pasture surface.

These features are not without drawbacks, however. First these more efficient hay feeders are going to cost considerably more than the simple, open style feeders. Placing a bale is going to require a tractor with a loader, although some feeders can be filled with a hydraulic truck bed. These more efficient feeders are considerably heavier and cannot be stood up and rolled to a new location as with the open style feeders. Finally, lighter calves may not be able to access the core of the bale in some models. Be sure to explore these potential issues before you purchase a feeder.

Cold Temperatures (Continued)

Warm-season perennial grasses need an excellent source of P and especially K to reduce winter injury. Phosphorus is important in the overall plant health, especially in root development. Potassium is essential in over-wintering capability of Bahiagrass and Bermudagrass because it acts as the plant's natural antifreeze within the cells. Potassium enhances winter hardiness and resistance to frost. This is very important in poorly drained fields that are highly vulnerable to a larger array of winter injuries. Low K levels have shown to have the biggest effect in winter survival, yield production and disease resistance (Table 1).

It is important to note that winter kill in warm-season perennial grasses is highly variable and difficult to estimate because it could be affected by genetics, temperature extremes, geographical location, soil drainage, nutrient management factors and endless combination of the factors that interact with each other to cause a highly variable impacted phenomenon. Fall fertility and plant health does affect winter kill, but the pattern is not always clear. However, using "best management practices" that encourage healthy stands, better nutrient utilization along with rotational grazing and hay production practices that extend the longevity of the stand is the producer's best line of defense.

Table 1. Effect of Potash (K₂O) Rate on Yield and Stand of Coastal Bermudagrass (6-year average) with Low Soil Potassium Level.

K ₂ O	Hay Yield	Year	
		Year 1	Year 2
	Ibs. /ac	lbs./ac	
0	8919	57	29
100	12399	47	84
200	13583	45	89
400	14341	41	88

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**KAY COUNTY
EXTENSION**

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