

Some Hay Considerations



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Texas A&M AgriLife Extension Service

Four Aspects to Consider

1. Forage Species
2. Bale Size
3. Physical Characteristics
4. Chemical Characteristics (Nutritive Value)

Four Aspects to Consider

1. Forage Species

Species

- Annual vs. perennial
- Cool-season vs. warm-season
- Legume vs. grass

Forage Nutritive Value Hierarchy (Typical)



Four Aspects to Consider

1. Forage Species
2. Bale Size

Hay Cost/Ton by Bale Size

Price per Bale (Round Bales)				
	\$50	\$60	\$70	\$80
Weight of Bale (lbs)	Cost /Ton Hay (\$)			
800	125	150	175	200
900	111	133	156	178
1000	100	120	140	160
1100	91	109	127	145
1200	83	100	117	133
1300	77	92	108	123
1400	71	86	100	114

Hay Cost/Ton by Bale Size

Price per Bale (Small Bales)				
	\$3	\$4	\$5	\$6
Weight of Bale (lbs)	Cost /Ton Hay (\$)			
50	120	160	200	240
55	109	145	182	218
60	100	133	167	200
65	92	123	154	185
70	86	114	143	171

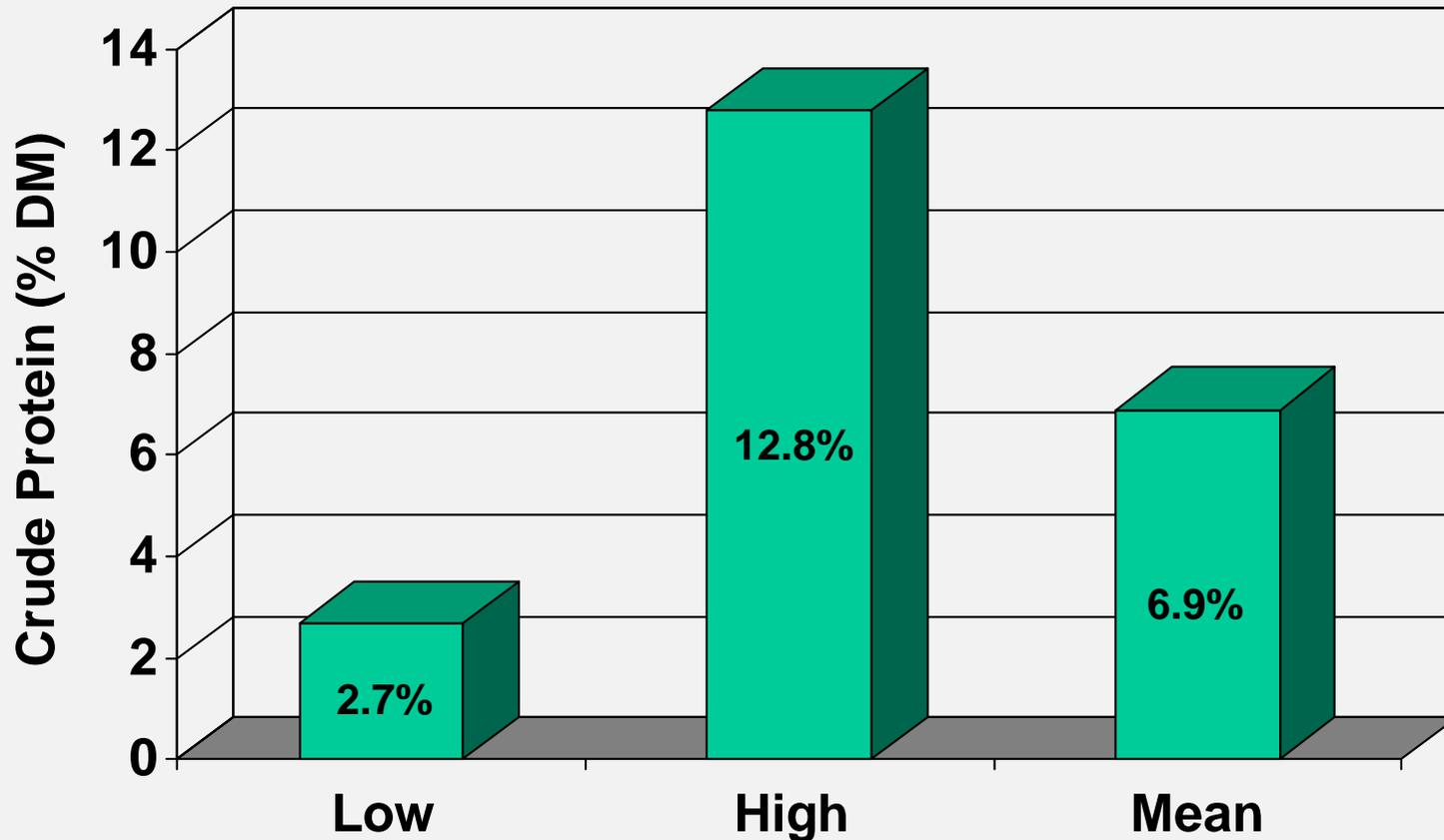
Four Aspects to Consider

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Hay Show “Rules”

- Texture
 - “Would you want to lay your head on it...?”
- Presence of seedheads
 - Indicates advance maturity
- Smell
- Presence of weeds
- Dust or mold

Purchased Hay Crude Protein



Medium green, heavily fertilized, no seed heads...

Light green, no seed heads...

What about purchasing sight-unseen?

- Out-of-state purchases
 - Unknown size
 - Unknown nutritive value
 - Noxious weed introduction
- In-state, but from strangers
 - Same issues as above





Four Aspects to Consider

1. Forage Species
2. Bale Size
3. Physical Characteristics
4. Chemical Characteristics (Nutritive Value)

Analyze Your Hay for Nutritive Value

- You cannot determine nutritive value by “**looking**” or “**feeling**” or “**smelling**” the hay.
- **Over-estimating** your hay’s nutritive value can severely affect animal performance.
 - I.e., low body condition score at calving.
- **Under-estimating** your hay’s nutritive value can lead to excess supplementation cost.
 - You fed when you didn’t need to...
- Check for **toxic** levels of **nitrates**.



Laboratory Analyses



Colorado Hay Probe Model 2001

Stainless Steel Piercing Tip
Re-Sharpenable
Replaceable



Collection Chamber
Holds Approx. 1/2 Pound
Perfect for the Lab



Removable End Cap

Push Rod

Sliding Tip Guard

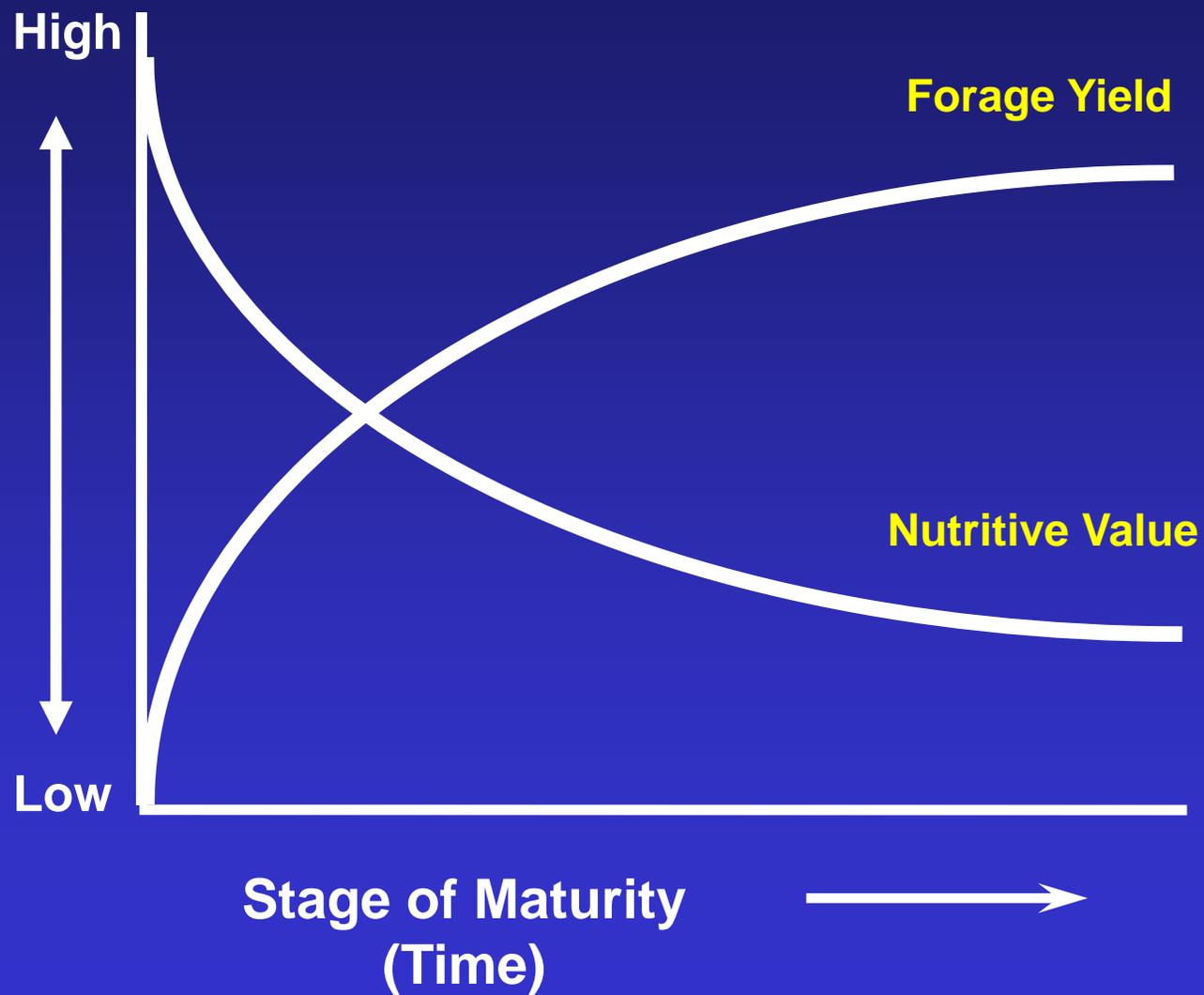
Durable Anodized
Aluminum Alloy



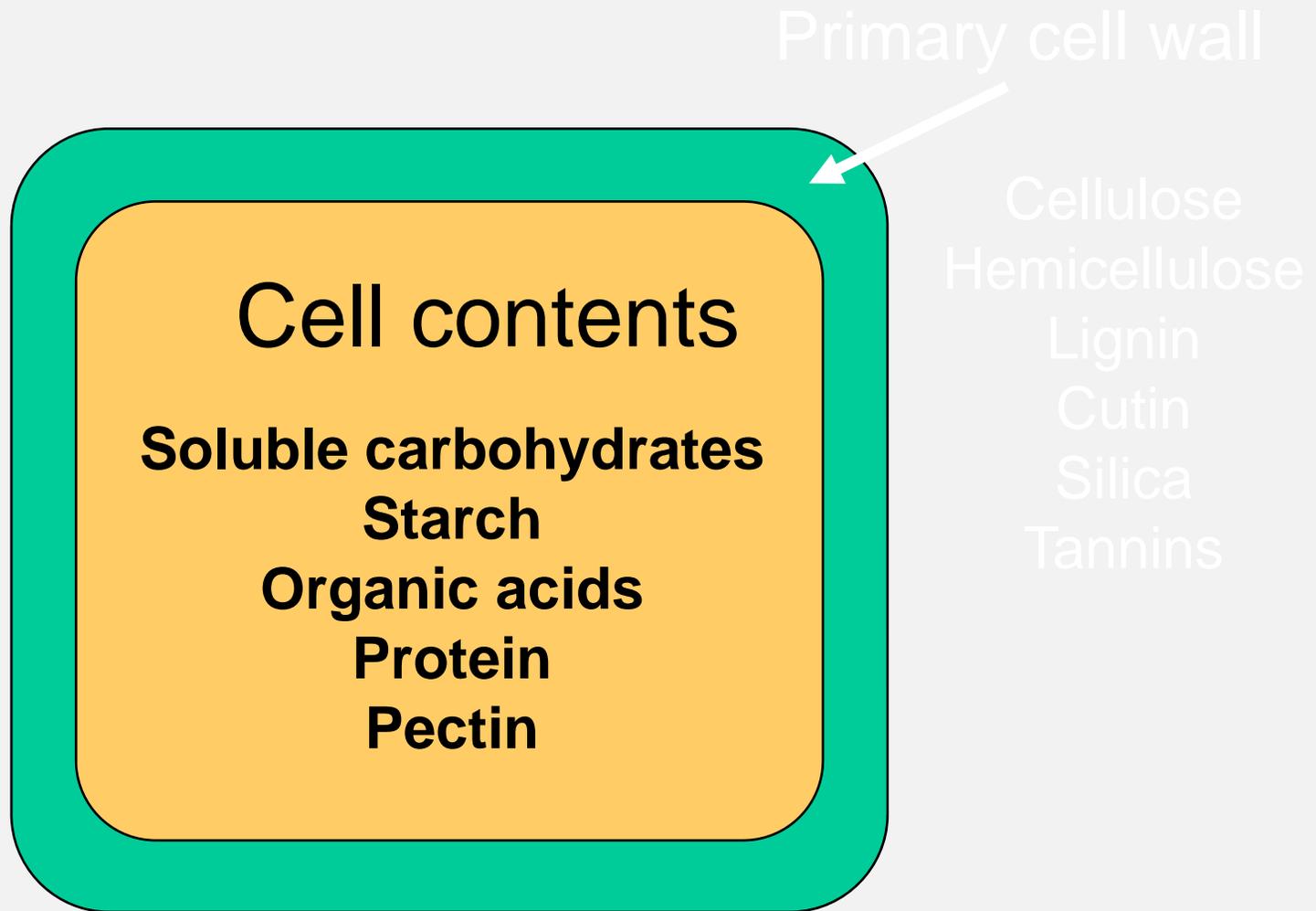
REDMON'S RULES

Maturity is the eternal enemy
of forage nutritive value.

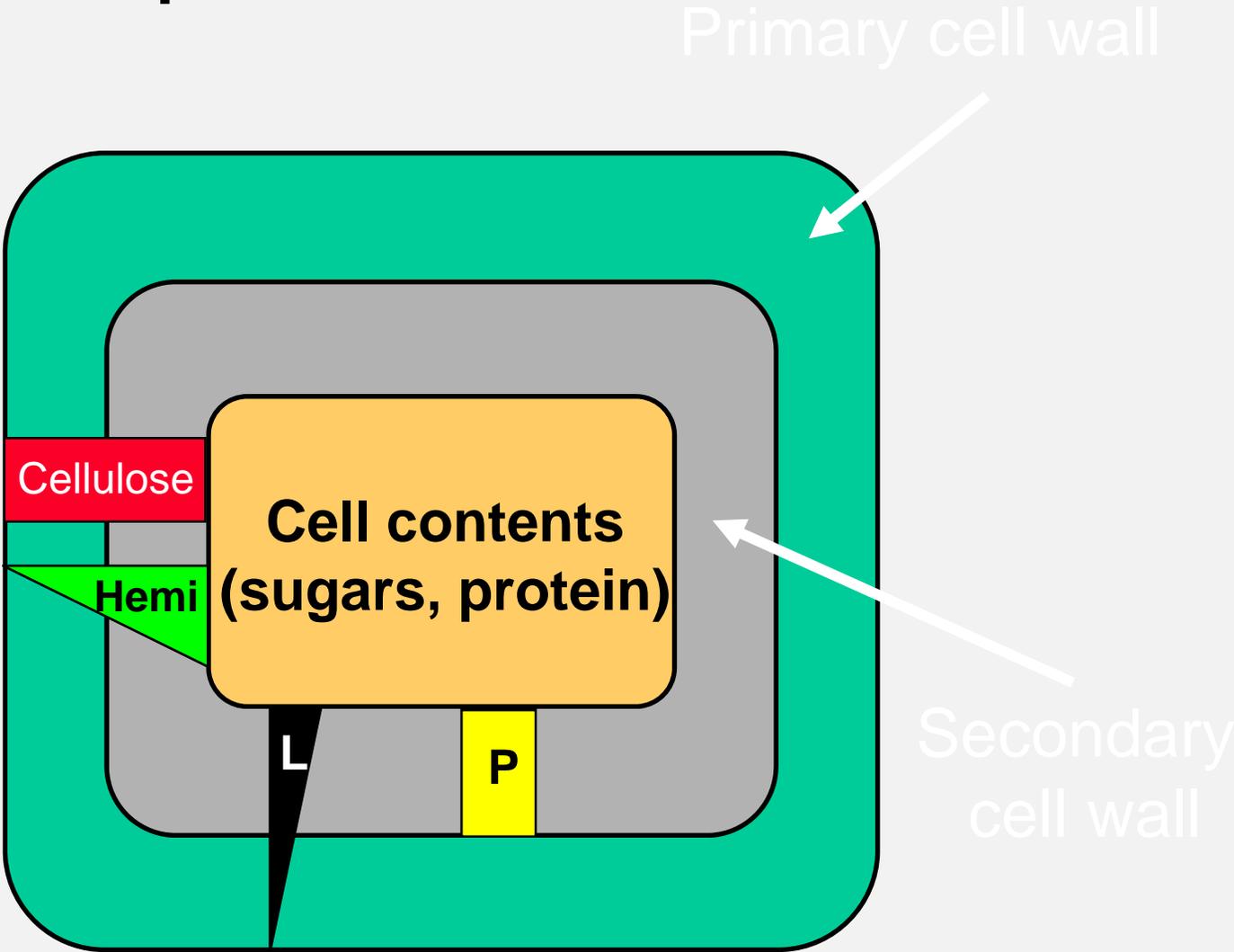
Effect of maturity on forage yield and nutritive value



Immature plant cell



Mature plant cell



So, why do we care about
CP and energy???

Table 1. Crude protein (CP) and total digestible nutrients (TDN) levels required in diets of different kinds and classes of grazing livestock.¹

Animal kind/class	CP (%)	TDN (%)	NEm (Mcal/day)	NEg (Mcal/day)	NEI (Mcal/day)
Growing beef steer					
450 lbs (1.7 lb/day gain)	11-13	65		2.0	
650 lbs (1.7 lb/day gain)	10-11	68		2.7	
Beef cow					
Lactating	10-12	60		n/a	4.2
Dry, pregnant	8-10	50	8.54	n/a	
Sheep					
Lamb (finishing)	12	70			
Ewe (lactating)	13	65			
Ewe (maintenance)	9	55			
Fallow deer					
Doe (lactating)	14-6	66			
Growing buck	12-14	60-64			
Meat-type goat					
Doe (lactating)	12	62			
Growing buck	12-13	62-66			
Horse (maintenance)	10-11	70			

¹ Adapted from *Southern Forages*, 2nd ed., 1998.

Plant Species & Nitrates

- Warm-season annual grasses
 - Forage sorghums
 - Sorghum-sudan hybrids (haygrazer)
 - Sudangrass
 - Millets
 - Corn
- Warm-season annual broadleaves
 - Pigweed, kochia, sunflowers, lambsquarters
- Perennials, others
 - Johnsongrass, bermudagrass, small grains



Minerals

- Additional charge for mineral analyses
- Typically addressed via mineral supplementation in the pasture.





Forage Analysis Report

Soil, Water and Forage Testing Laboratory
 Department of Soil and Crop Sciences
 345 Heep Center, 2474 TAMU
 College Station, TX 77843-2474
 979-845-4816 (phone)
 979-845-5958 (FAX)

Report generated for:
 Bryan Farms

Visit our website: <http://soiltesting.tamu.edu>
 Sample received on: 11/23/2009
 Printed on: 12/7/2009

County

Laboratory number		87006	87007		
Customer Sample ID		#2 Bryan Farms	#1 Bryan Farms		
Forage Type		Sudan/Sorghum Hybrid	Bermudagrass (Tifton 85)		
Forage Use		Hay	Hay		
Crude Protein	%	9.5	7.8		
Acid Detergent Fiber	%	32.1	36.7		
TDN-based on ADF	%	60.1	56.0		
Net Energy Lactation	Mcal/lb	0.61	0.57		
Mineral Analysis					
Phosphorus	%	0.16	0.39		
Potassium	%	1.13	1.67		
Calcium	%	0.39	0.38		
Magnesium	%	0.30	0.15		
Sodium	ppm	414.	1667.		
Zinc	ppm	49.	58.		
Iron	ppm	192.	72.		
Copper	ppm	8.	11.		
Manganese	ppm	154.	61.		

Results reported on a 100% dry matter basis.

For more information visit: <http://soiltesting.tamu.edu> - the laboratory website
<http://forage.tamu.edu> - Forageval program for estimating rate of gain for beef cattle
<http://foragesoftexas.tamu.edu> - collection of information on forages grown in Texas

Forage Report

Forage Report

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REDMON'S RULES

Pay attention to storage
conditions...

Farm Improvements Mean More Business for You

*Increase Your Profits and Make Money for the Farmer
by Building Him a Hay Barn*

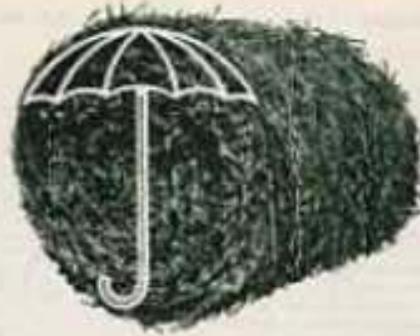
By HIRAM H. SHEPARD

In every progressive farming section the size of the barns increases as the section advances in agricultural efficiency. This is logical and good business, for a roof shelter for field crops and live stock pays for itself over and over again during its lifetime. In some cases, especially during unusually wet and stormy seasons, a cheap hay barn will almost pay for itself in one year in the saving of a large quantity of first-class hay. And hay now is worth from two to three times what it was a decade ago, while the cost of building has not increased in the same ratio.

The hay barn enables the farmer also to hold his product to be handled at his convenience when more important farm operations are not pressing for attention, and to market when prices are good.

Not many years ago straw of all kinds was considered practically worthless, except for bedding and the roughest kind of feeding. It was, and still is in many places, left out in the weather in loose stacks to rot down and blow away, becoming almost total loss. But modern farming now recognizes the value of straw, the market price of which to-day

Round Bales
have a built-in
"UMBRELLA"



The curved top of a round bale stands alone like an umbrella. Here is your answer to one of the biggest crop losses in farming—wet and weathered hay.

In your own lifetime, think how many times a horse-owned ROTO-BALER could have paid for itself by protecting hay from weather spoilage. Saving 50 tons of valuable bales—one good crop—could do it this season!

Round bales cannot work magic and turn poorly cured hay into choice No. 1 grade. But if hay is sweet and cured properly, round baling preserves the vitamins and protein by rolling in the leaves—dry and safe.

Have haying days? Time it perfectly with your own ROTO-BALER. Your reward will come in the greater productivity and well-being of your herd for years to come.

Only the ROTO-BALER has it!

"Roll-in" compression rolls force in the bales and shield them from weather. When hay is round-baled... it's safe!

More economy! That's the final great advantage of a ROTO-BALER, priced for the individual farmer. Your own haying pays for it easily. No other haying system equips you for such quick timing, when hay and weather give the signal to bale fast!

ROTO-BALER and the Chalmers Sealmark



ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE, U. S. A.

ROTO-BALER

51165 f.o.b. factory
including Power Take-Off



1955 Allis-
Chalmers ad



Effect of storage system on dry matter loss of ryegrass hay stored for 7 months¹

Storage System	Dry Matter (%)	Animal Refusal (%)	TOTAL (%)
Ground	28	22	50
Gravel	31	17	48
Tires	35	6	41
Rack	26	6	32
Rack with cover	12	2	14
Barn	2	1	3

¹ Nelson et al., 1983

How long will hay last in the barn?



Hay tarps also work well...



OUTSIDE HAY STORAGE RECOMMENDATIONS

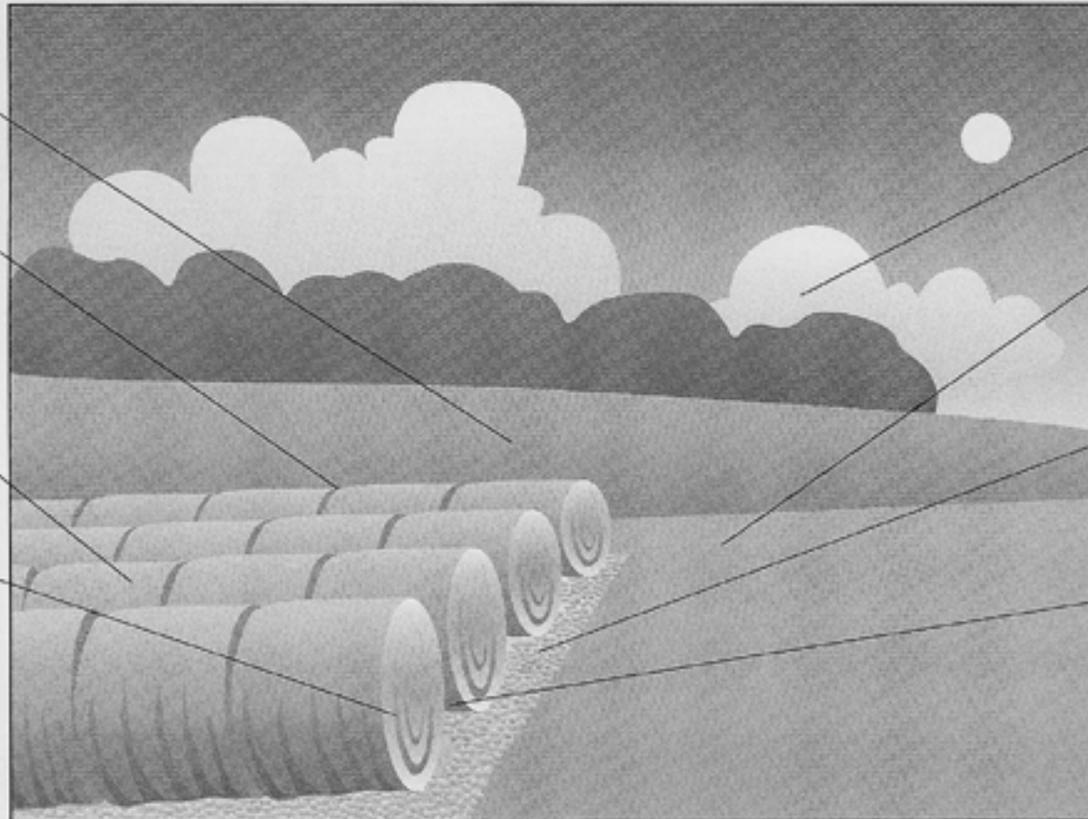
No objects near hay which are likely to attract lightning

Flat ends of bales butted tightly together

Bale rows run up and down slope with north/south orientation; a southern exposure is best

High bale density resists water penetration

Tops and sides of bales can be protected from rain with any of a number of different types of covers



Bright, sunny location; no trees or other objects near hay to slow drying after rains

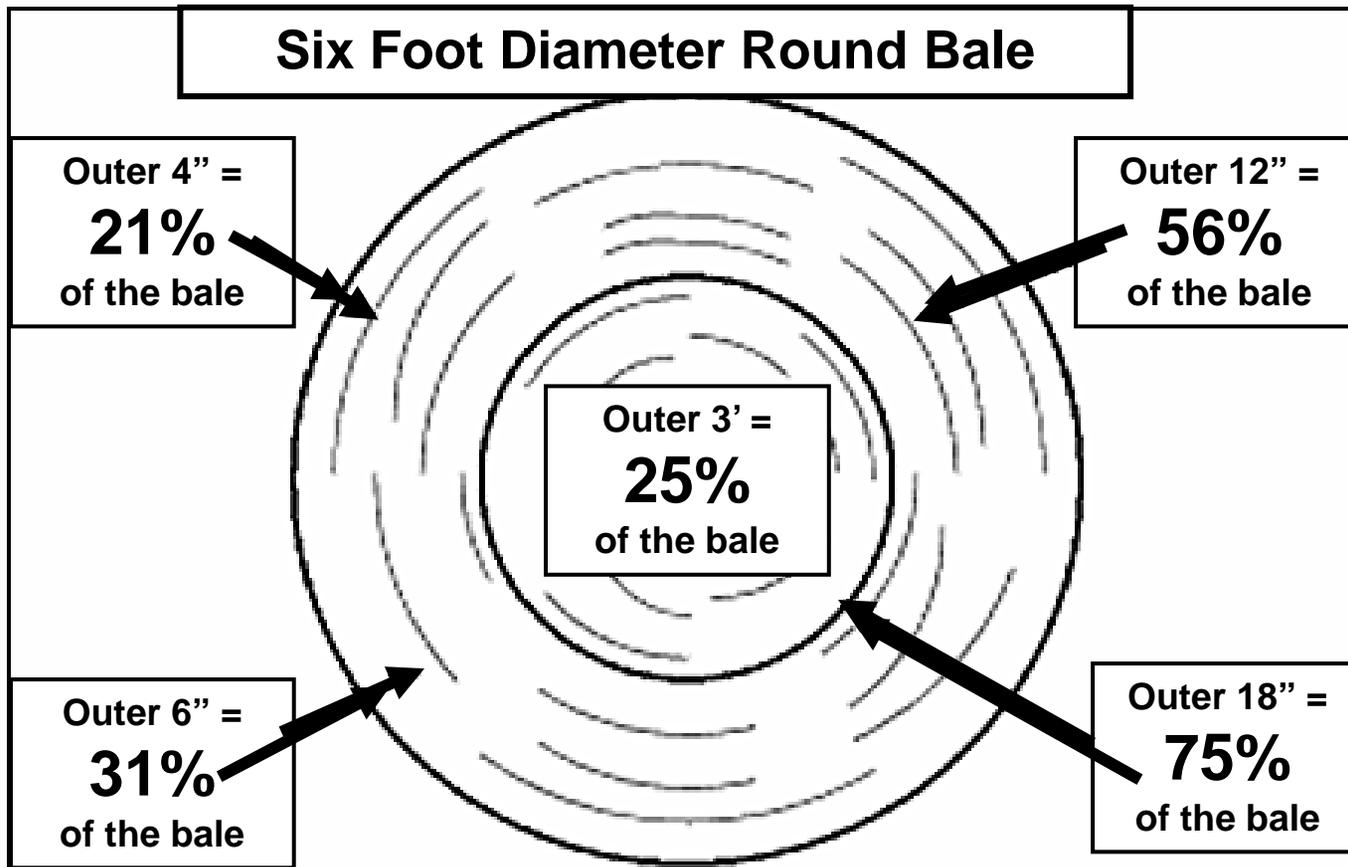
Storage area located on a gently sloping, well-drained site

Hay/soil contact avoided by placing bales on rock, wooden pallets, etc.

Rounded sides of bales not touching; at least 3 feet of space between rows

Fire risk can be reduced by storing hay in more than one location and by maintaining a no-vegetation zone of at least 3 feet in width around the storage area

Hay Losses During Storage



Net Wrap Versus Twine

- Hay wrapped with net wrap loses less DM than hay wrapped with twine (10%?).
- Net wrap is generally used to reduce wear and tear on the baler and to speed up the baling process.
 - Less revolutions in the bale chamber

UK Tall Fescue Storage Research

Storage Method	Weathered Depth (in.)	DM Loss (%)
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Twine	4.4	18.2
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Netwrap	2.1	10.6
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Solid plastic	0.6	3.6
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Shed	0.5	5.7
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John Deere B-Wrap

John Deere B-Wrap

- Developed by JD and Tama, an Israeli company that manufactures net wrap for JD and others worldwide.
- Replaces netwrap in most JD balers with retro kit; newer balers B-Wrap ready.
- Protects better than netwrap from rain, snow, ground moisture.
- Adds ~\$7/bale to overall per/bale cost plus other issues...

REDMON'S RULES

If possible, buy and sell
based on nutritive value...

Hay Marketing

- Purchasing
 - Most producers should purchase hay.
 - Purchase based on crude protein (CP) content and dry matter (DM) weight.
 - If seller can't or won't furnish the info, consider other sources.
- Selling
 - Sell based on crude protein (CP) content and dry matter (DM) weight.
 - Randomly sample each lot of hay
 - Crude protein analysis as minimum
 - Have the ability to weigh hay bales

Summary

- Understand the nutrient requirements of your animals.
- Always obtain a forage analysis for CP & for Nitrates. (2 different tests)
- Purchase hay from a reputable producer that meets the nutrient requirement of your animals.
- Store hay appropriately to reduce DM and nutritive value losses.

- AgriLIFE EXTENSION
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Utilization Establishment
Management Fertility

HOT! [Click for Drought Management Info](#)

...PUTTING THE PIECES TOGETHER...
IT'S NOT A PUZZLE, IT'S A CHALLENGE...

HOWDY, and WELCOME to the Texas A&M University Agriculture Program **FORAGES** web site! At this site you will be able to read or download forage-related publications that will help with forage species selection, establishment, management, and utilization. There is information on soil fertility, grazing management, incorporating legumes into your forage system, and minimizing winter feeding costs. You will also find information about our Pasture & Livestock Management Workshop for Novices, how to manage forage pests, information about upcoming events, and a new feature, *The Pasture Gazette*.

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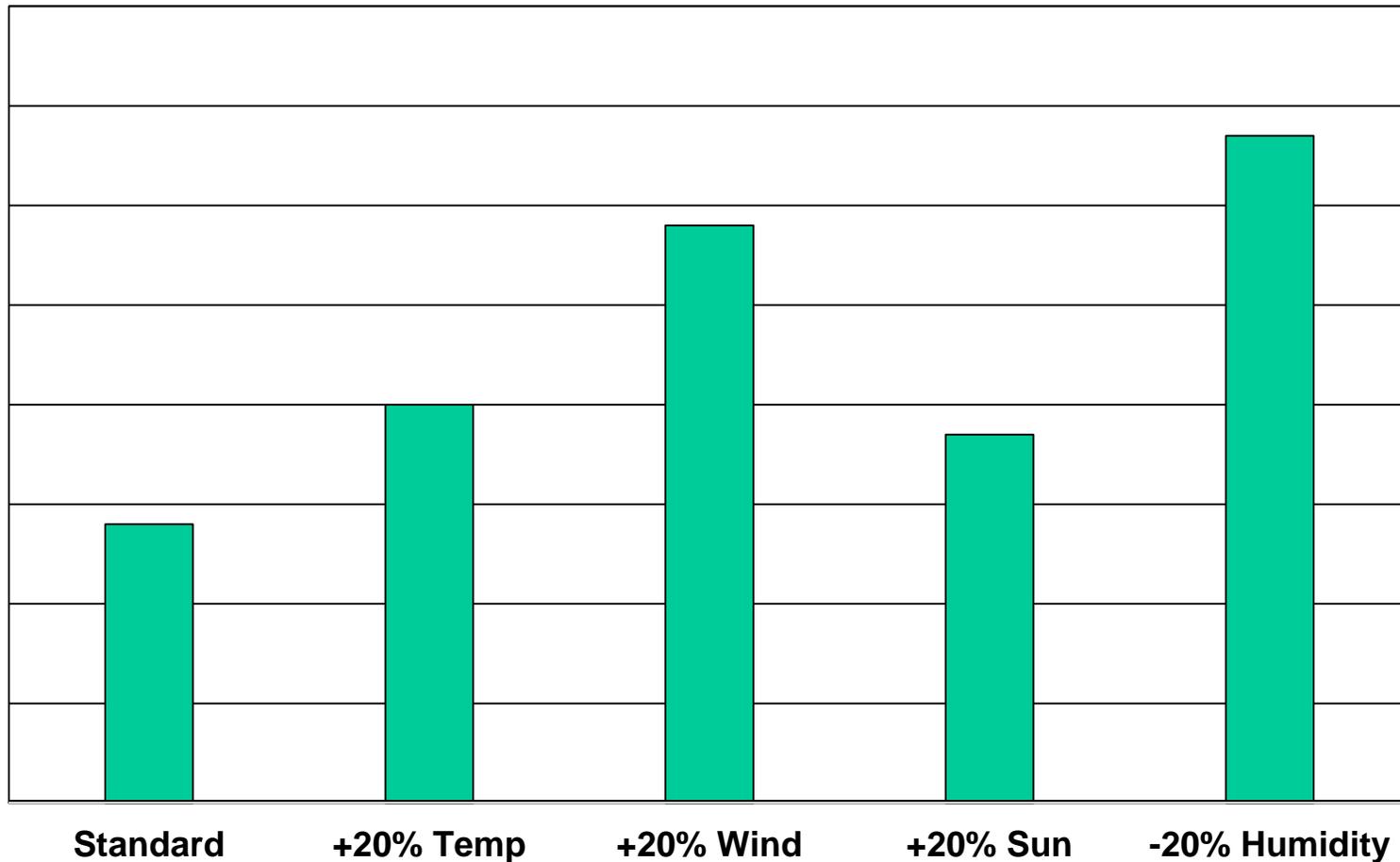
<http://forages.tamu.edu>

Think forage...

TEXAS A&M
AGRILIFE
EXTENSION

Questions?

Figure 1. Relative effects of changing the factors affecting drying rate by 20 percent each¹



Standard is 77°F; wind 2.5 mph; 40% sunshine; 40% RH

¹ Adapted from Undersander