

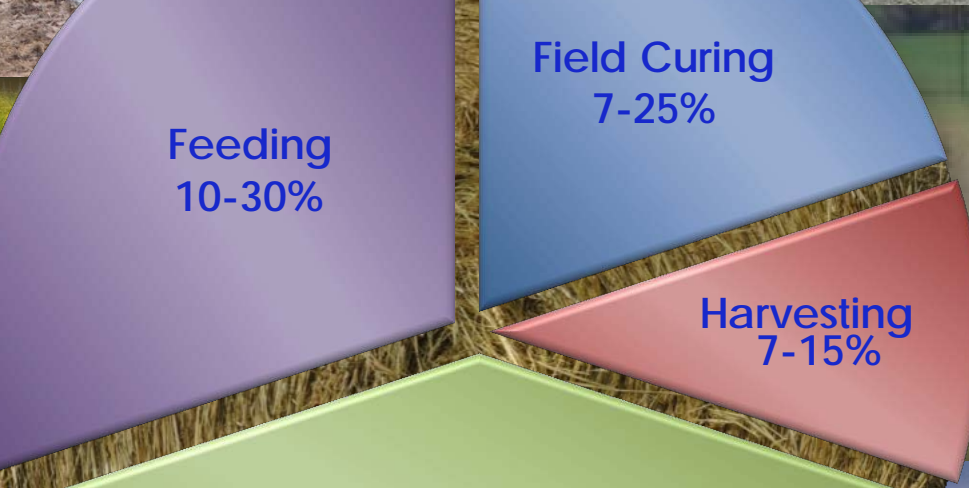
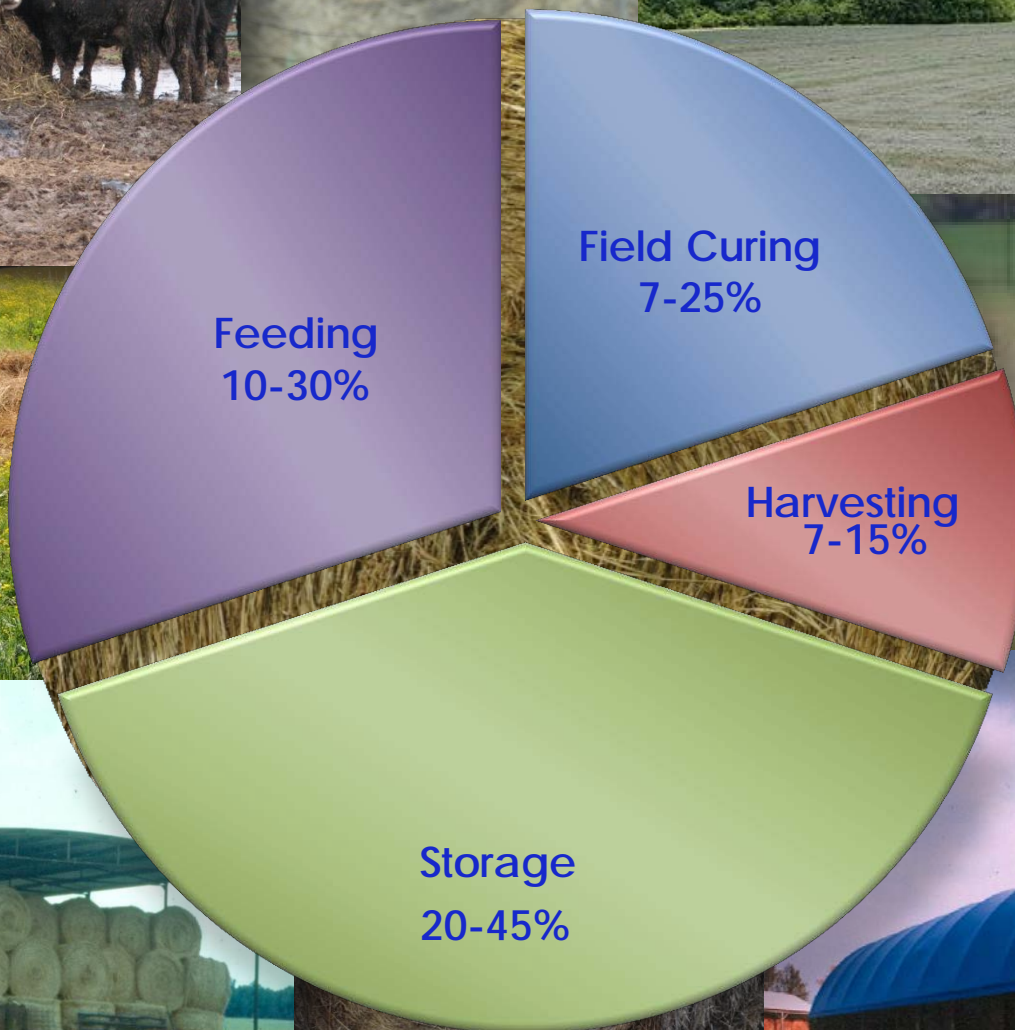


HOW TO CUT, CURE, AND HANDLE HIGH QUALITY FORAGE

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Our Biggest Problem is **LOSS**

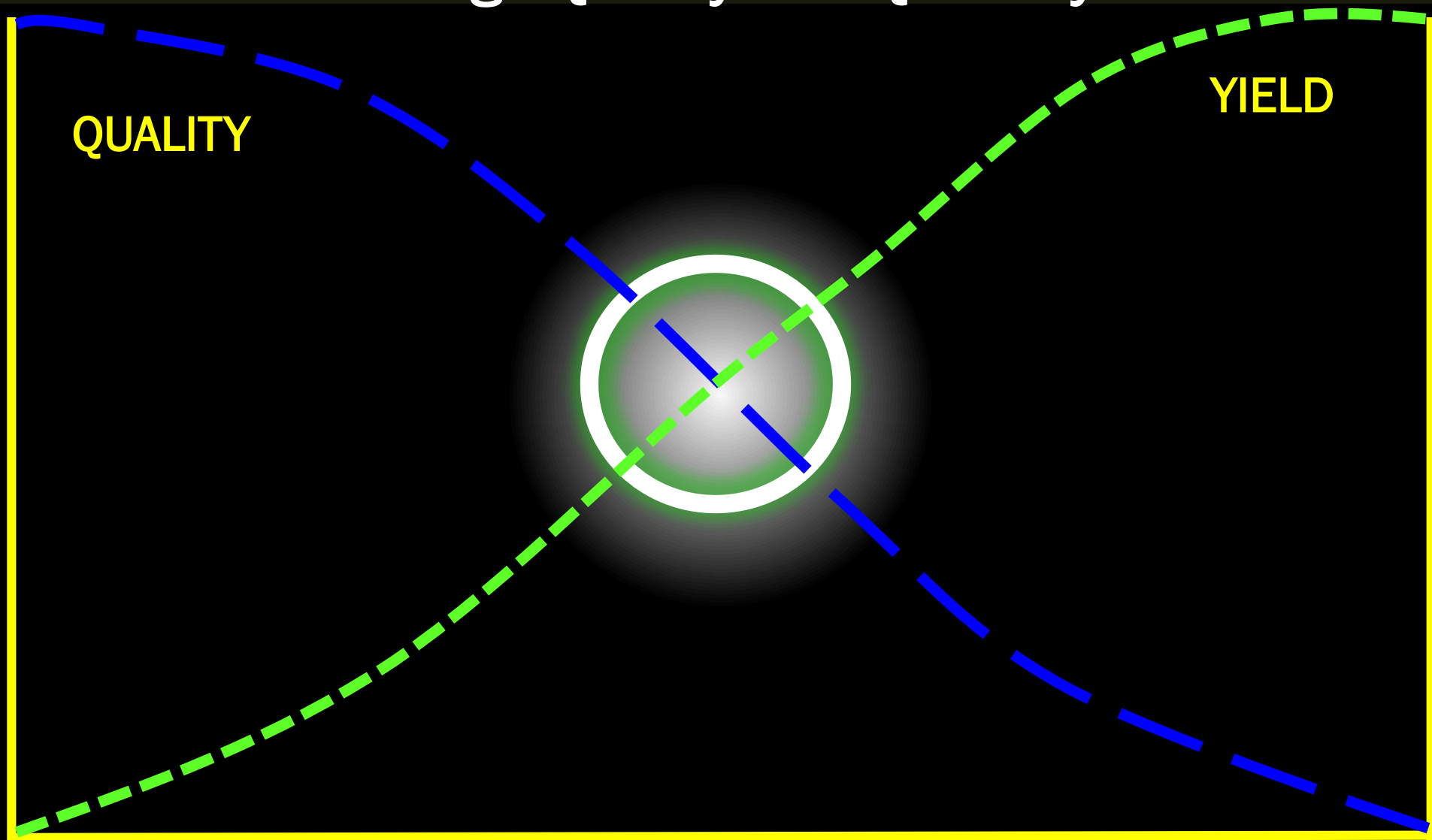


Timing is Everything!

- When to cut?
 - *When plant is at the right stage of growth*



Forage Quality and Quantity

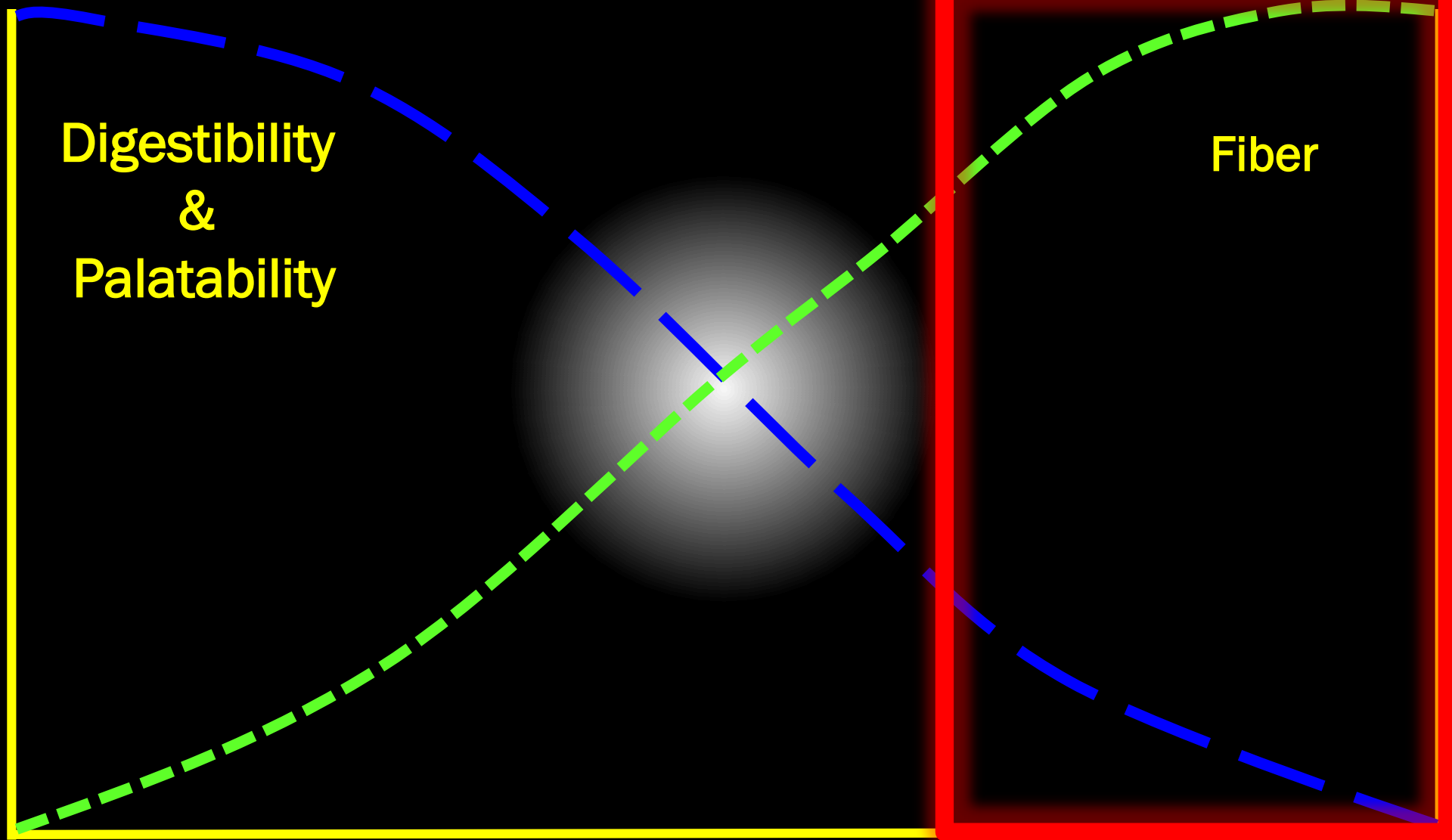


QUALITY

YIELD

Stage of Maturity

Forage Quality and Quantity



Stage of Maturity

Timing is Everything!

- When to cut?
 - *When plant is at the right stage of growth*
 - *When weather conditions are favorable*

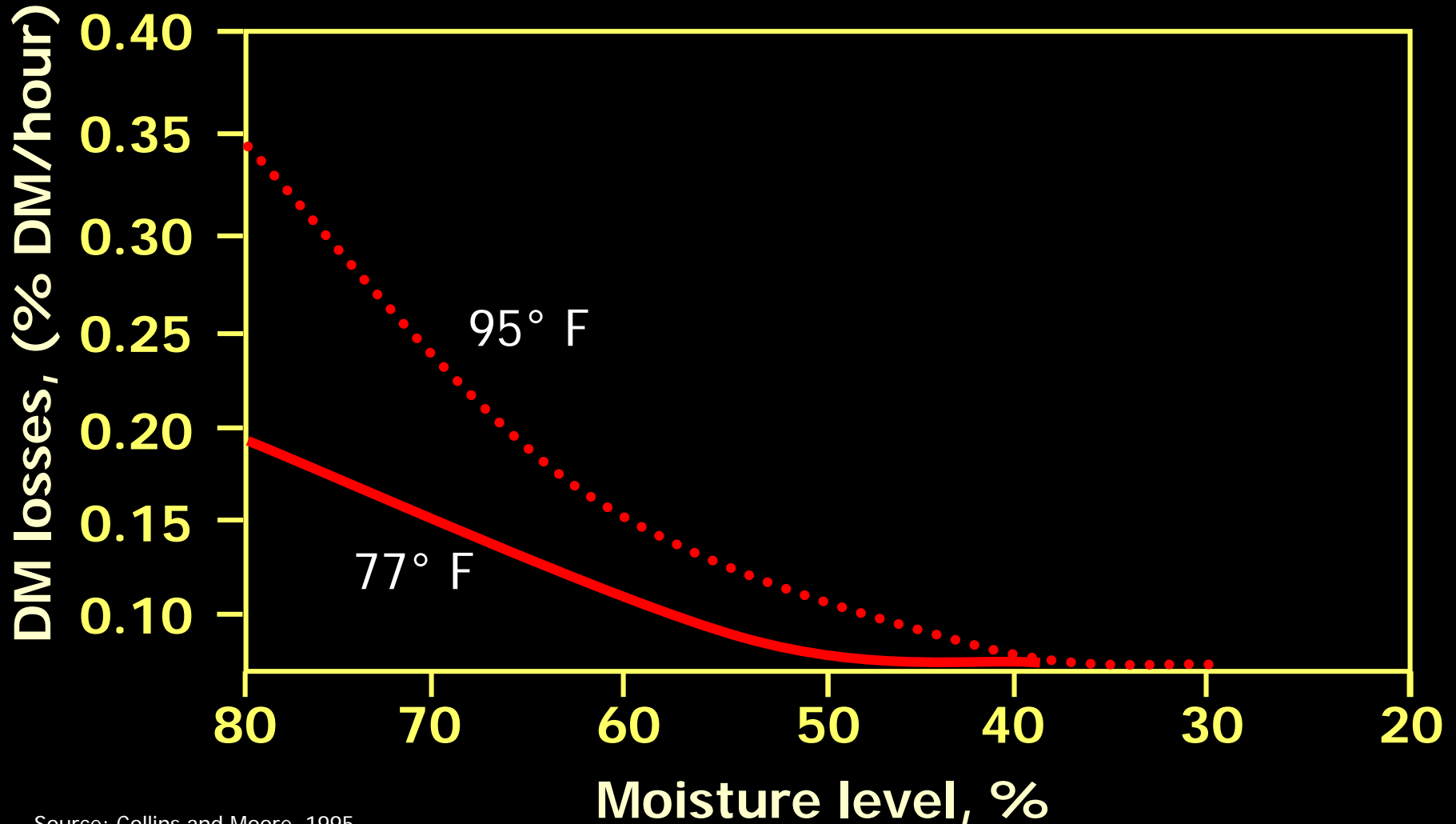


Field Curing 7-25%

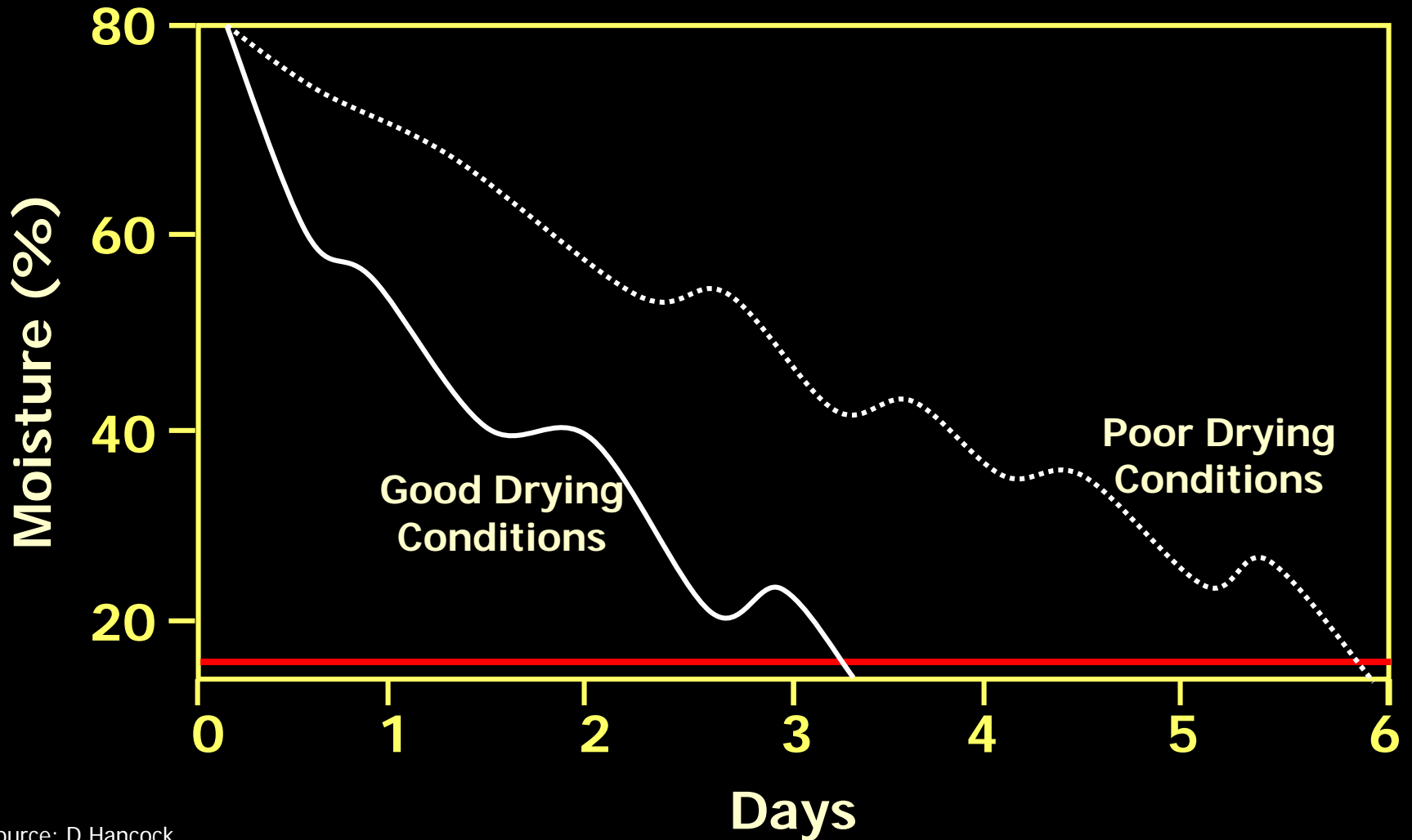


Respiration can result in 2 – 16% dry matter loss

Rate of Respiration Loss Depends on Internal Crop Moisture and Air Temperature



Drying Times Vary



The effect of rain during curing on hay losses¹ .

Loss	Alfalfa			Red Clover		
	No rain	2" rain during curing	3" rain on dry hay	No rain	2" rain during curing	3" rain on dry hay
	------(%)-----					
Leaf loss	8.8	16.4	14.7	10.5	16.8	20.4
Leaching and respiration loss	1.3	27.7	39.1	0.5	32.5	34.7
Total loss	10.0	44.0	53.8	11.0	49.2	55.1

¹ percent of initial dry matter

Source: M. Collins. 1983. Agronomy Journal. 75:523.

Should I cut or should I wait?

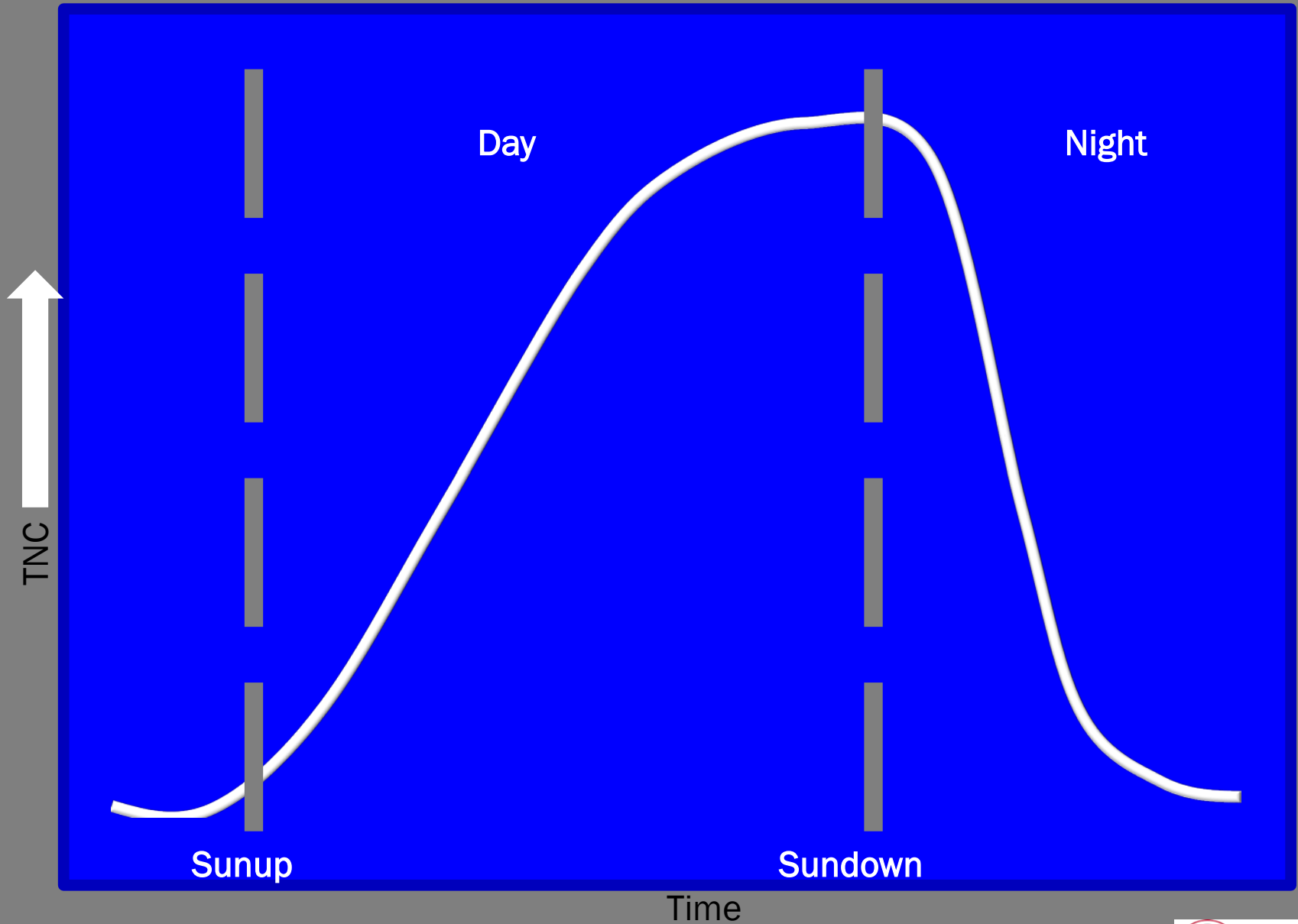
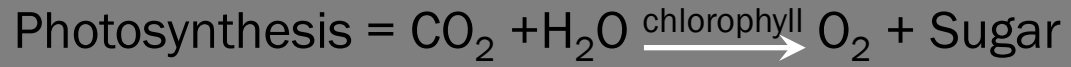
- Late hay making can result in extensive loss
 - *Loss in quality and digestibility*
 - *Wilting losses in the swath*
 - *Increased leaf shatter*
- Wilting and shattering losses are always proportionally higher with late-cut than with early-cut forages.



Timing is Everything!

- When to cut?
 - *When plant is at the right stage of growth*
 - *When weather conditions are favorable*
- Morning or evening?

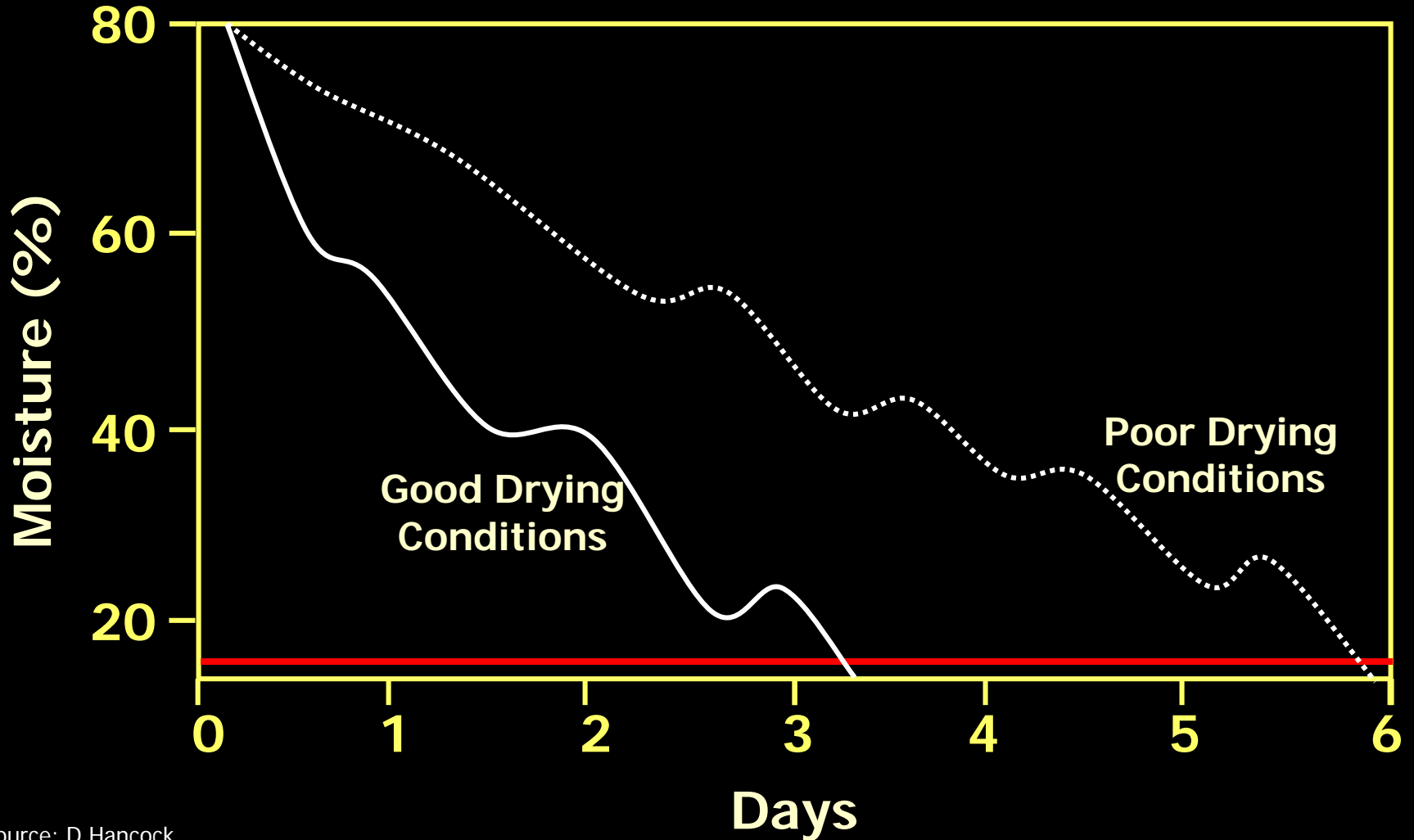




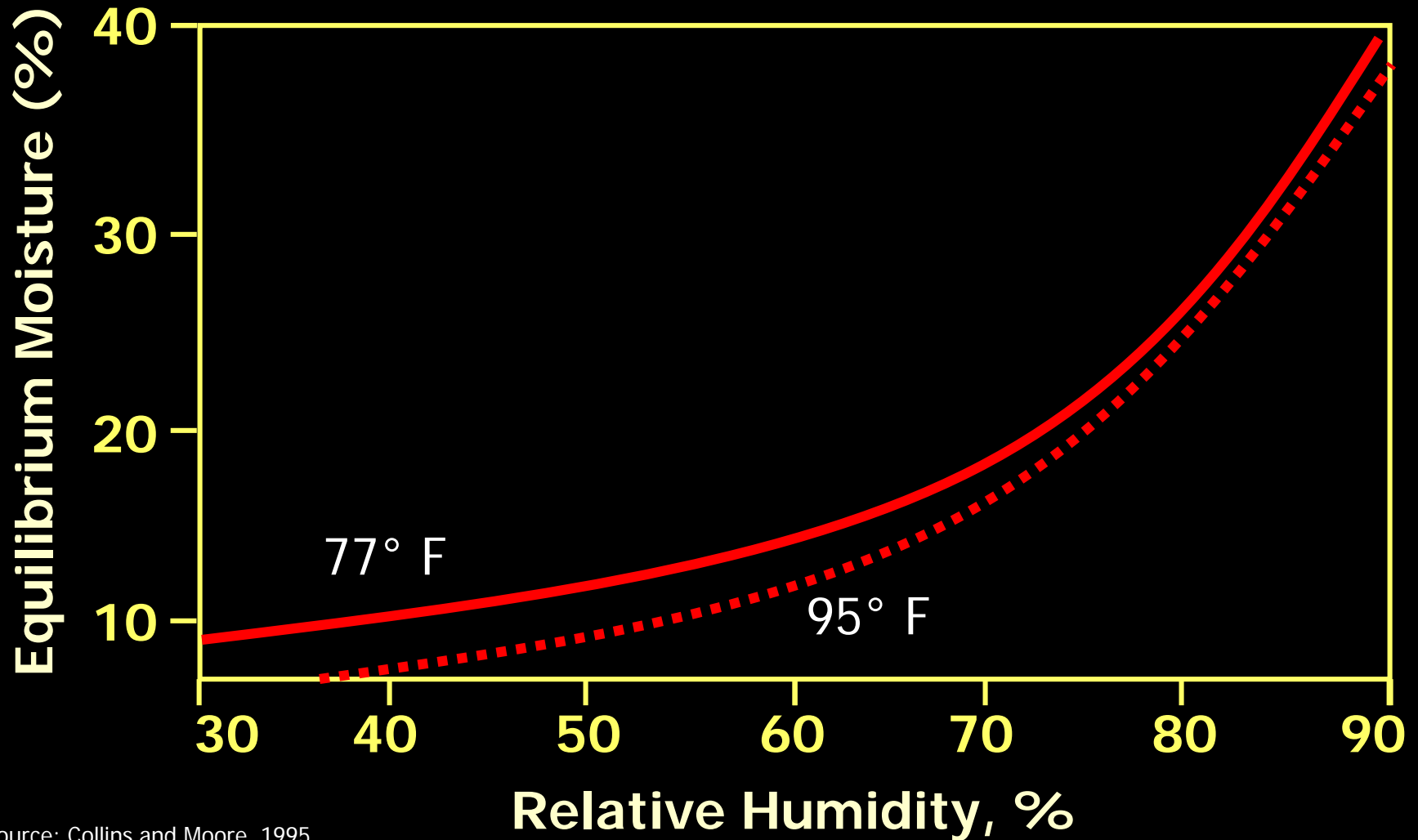
Timing is Everything!

- When to cut?
 - *When plant is at the right stage of growth*
 - *When weather conditions are favorable*
- Morning or evening?
 - *Morning – the forage is wetter but you get a full day of drying time*
 - *Evening – the forage is dryer, but the energy level may be greater due to increased carbohydrate concentrations in the plant material*

Night-Time Moisture Fluctuations



The Effect of Relative Humidity



Timing is Everything!

- When to cut?
 - *When plant is at the right stage of growth*
 - *When weather conditions are favorable*
- Morning or night?
 - *Morning – the forage is wetter but you get a full day of drying time*
 - *Evening – the forage is dryer, but the energy level may be greater due to increased carbohydrate concentrations in the plant material*
- When to rake, ted, and bale?
 - *When the moisture content is just right!*

To be Timely you need to Be Prepared!

- Have the equipment maintained and ready
 - *It's better to be waiting on the plant, than to be working on a mower when the plant and weather are ready to go!*



Harvesting 7-15%

- Leaf losses can be high during baling operations (1-15%)
- Losses with conventional balers can range from 8-15%





Leaves Our Greatest Loss

MOWING

Mower Options

- Sickle Cutterbar
 - *10-20% less expense*
 - *Require 30% less hp*
 - *Repairs are less expensive*
- Disk Cutterbar
 - *Faster ground speed*
 - *Cuts through ant hills better*
 - *Maintenance is 20-30% less*
 - *Better if crop is lodged*



Using hay crimpers or crushers (conditioners) leads to reduced:

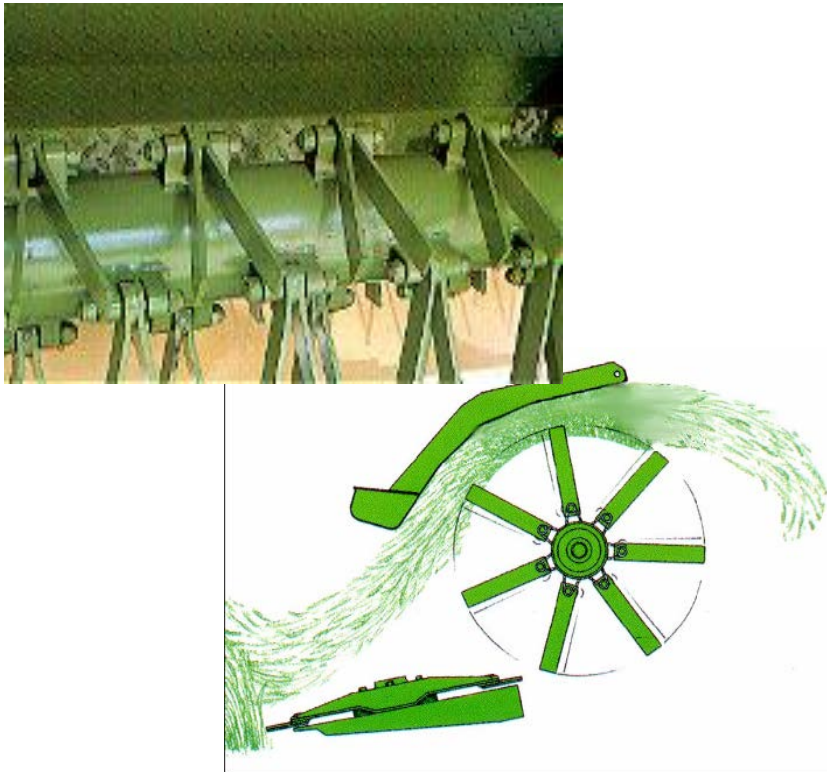
- Dry matter loss
- Curing time in the swath
- Exposure to the weather
- Leaf shattering and respiration losses



Crushing Stems (conditioning) at mowing will cause stems to dry at nearly the same rate as leaves!

Conditioner Styles

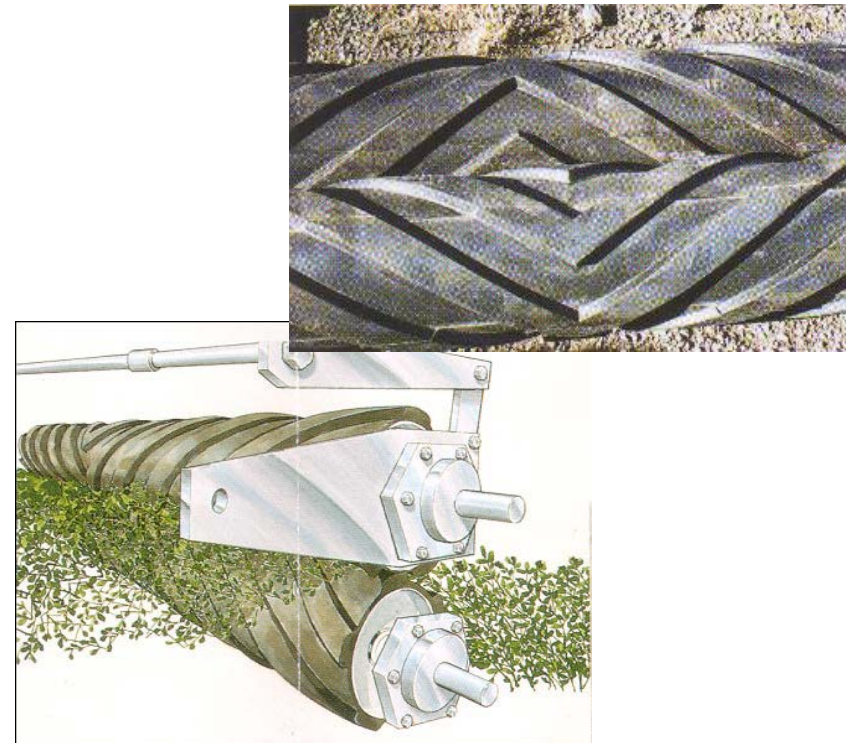
Impeller (flail)



Fine stemmed grass

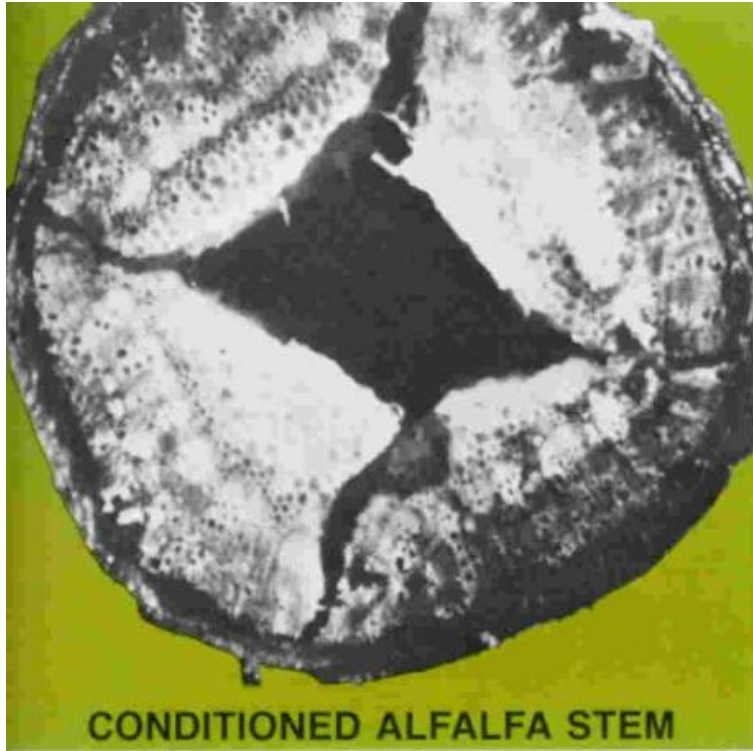
Source: D Hancock

Roller (crimper)



Thick stemmed grass
and Leafy (legumes)

Cross Section of Crop Stem



- Stems have a waxy surface called cutin
- Conditioning should scratch or crack the stem surface for faster drying

TEDDING



- Increase hay-drying rates by 20-40% (~ 0.5 – 1 day)
- DM Loss: Grasses (<3%) Legumes (7-10% +)
- Breaks up clumps & distributes the crop over the entire area.
 - *Increased sun*
 - *Fluffed for better air movement*
- Initial tedding: w/in 2-4 hrs (clumps break better)
- Additional tedding? May be necessary for grass, probable for alfalfa

RAKING

- Parallel bar rake
 - The lowest amount of hay loss, particularly with legumes.
 - Usually ground drive system.
- Rotary rakes
 - Some are dual function (rake or ted).
- Wheel rakes
 - Operated at a higher speed (saves time)
 - Tend to leave more in the field.



BALING

Square vs Round Bale

- Round bales

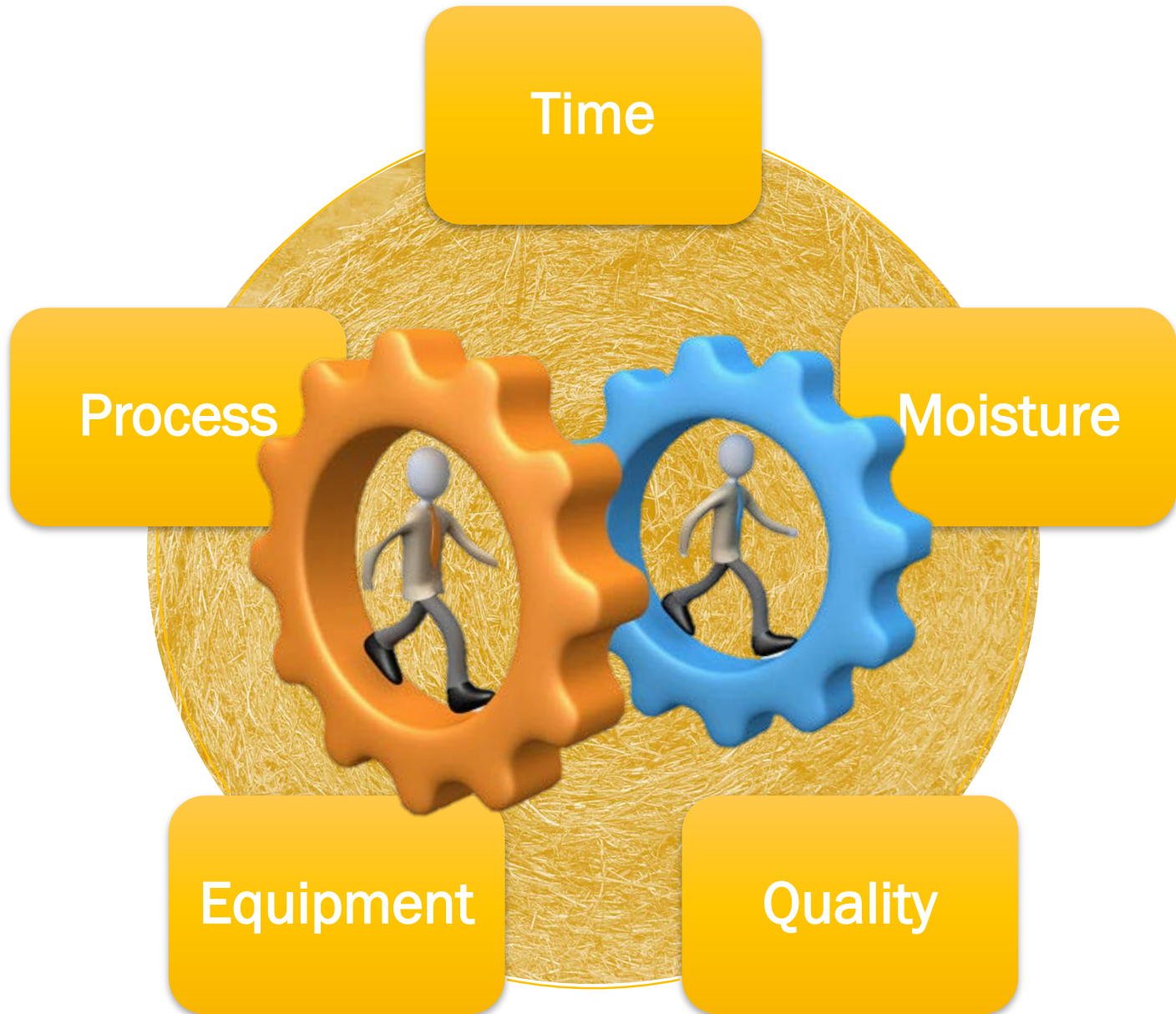
- *Large (800-2000 lbs)*
- *Easy to handle, if you have a tractor*
- *Less expensive (\$/dry ton)*
- *Lots of waste*



- Square (small rectangular) bales

- *Small (40-75 lbs)*
- *Relatively easy to handle and store*
- *More expensive (\$/dry ton)*





Management can make or break the operation

Hay Harvest, Storage, and Feeding Losses

Percent Loss, %				
	Lax Management		Good Management	
	<u>Incremental</u> *	<u>Additive</u> **	<u>Incremental</u> *	<u>Additive</u> **
Field Curing	25	25	12	12
Harvesting	15	36	8	19
Storage	35	58	5	23
Feeding	30	71	8	29
Total Loss	-	71	-	29
*Losses of dry matter remaining at beginning of each step				
**Losses accumulate with each step				

Source: Southern Forages 4th edition pg 307
 Dr. Mike Collins, Mississippi State University

Hay Curing Management

■ Conditioner?

■ YES

Hay Curing Management

■ **Complainer?**

■ **Wide or Narrow Swath?**

■ **YES**

■ **Wide as Possible**

Hay Curing Management

■ Conditioner?

■ YES

■ Wide or Narrow Swath?

■ Wide as Possible

■ When to Mow?

■ Optimum time for the crop

Hay Curing Management

- Conditioner?
- Wide or Narrow Swath?
- When to Mow?
- Ted it?
- YES
- Wide as Possible
- Optimum time for the crop
- YES... but only when damp and toward the end of the when the dew is on.

(avoid tedding legumes when >50% moisture)

Hay Curing Management

- Moisture at raking?
 - 35-40% for legumes
 - 20-25% for grass/legume mixtures
 - ~<20% for bermudagrass
- Moisture at baling?
 - Small squares = 18%
 - Round Bales = 15%

Questions?



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