





















Profitability Dairy Tool—Forage Quality Drill Down

Developed by Marvin Hall and Greg Roth, Crop and Soil Science; Paul Craig, Extension Educator in Dauphin County and Gabriella Varga, Dairy and Animal Science

		1	2	3	Limitation	Ranking	
		Low Limitation	Moderate Limitation	High Limitation	(Low	Moderate	High)
ALFALFA HAY							
CROPPING ISSUES					LOW	MOD	HIGH
1.	Is hay more than 50% alfalfa?	Yes		No			
2.	Weeds controlled?	Yes		No			
3.	Insect or disease damage evident at harvest?	No		Yes			
HARVESTING ISSUES					LOW	MOD	HIGH
1.	Hay contains good leaf stem ratio and no evidence of mold?	Yes		No			
2.	Crop maturity at harvest?	At late bud stage or earlier.	Between late bud stage and 10% flower	Greater than 10% flower			
3.	Cut to harvest interval?	< 2 days	2-3 days	> 3 days			
STORAGE ISSUES					LOW	MOD	HIGH
1.	Hay stored under cover?	Yes		No			





































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	1 Low Limitation	2 Moderate Limitation	3 High Limitation	Limitation (Low	Ranking Moderate	High)
GRASS HAY						
CROPPING ISSUES				LOW	MOD	HIGH
1. Weeds controlled?	Yes		No			
2. Insect or disease damage evident at harvest?	No		Yes			
HARVESTING ISSUES				LOW	MOD	HIGH
1. Hay contains no evidence of mold?	Yes		No			
2. Crop maturity at harvest?	At boot or earlier.	Between late boot and 10% flower	Greater than 50% flower			
3. Cut to harvest interval?	< 2 days	2-3 days	> 3 days			
STORAGE ISSUES				LOW	MOD	HIGH
1. Hay stored under cover?	Yes		No			








































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		Low Limitation	Moderate Limitation	High Limitation	(Low	Moderate	High)
ALFALFA HAYLAGE— TOWER SILO							
CROPPING ISSUES					LOW	MOD	HIGH
1.	Is hay silage more than 50% alfalfa?	Yes		No			
2.	Weeds controlled?	Yes		No			
3.	Insect or disease damage evident at harvest?	No		Yes			
HARVESTING ISSUES					LOW	MOD	HIGH
1.	Is Theoretical length of cut (TLC) adjusted at harvest?	Yes		No			
2.	Is particle size assessed at harvest?	Yes		No			
3.	Dry matter at harvest?	35-45%		<35% or >45%			
4.	What was crop maturity at harvest?	At late bud stage or earlier.	Between late bud stage and 10% flower	Greater than 10% flower			
5.	Harvest completed rapidly with no evidence of spoilage between harvests?	Yes		No			
STORAGE ISSUES					LOW	MOD	HIGH
1.	Silo integrity?	Silo well sealed. No evidence of seepage.	Leaking just noticeable around doors and walls. Minimal seepage.	Widespread evidence of air penetration in silo or seepage			
2.	Silage evenly distributed?	Yes		No			
3.	Silage depth?	Depth of haylage greater than 40 feet in last fill.	Depth of haylage 30-40 feet in last fill.	Depth of haylage less than 30 feet in last fill			
4.	Is heating occurring prior to feedout?	No		Yes			





































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		Low Limitation	Moderate Limitation	High Limitation	(Low	Moderate	High)
ALFALFA HAYLAGE— BUNKER SILO							
CROPPING ISSUES					LOW	MOD	HIGH
1.	Is hay silage more than 50% alfalfa?	Yes		No			
2.	Weeds controlled?	Yes		No			
3.	Insect or disease damage evident at harvest?	No		Yes			
HARVESTING ISSUES					LOW	MOD	HIGH
1.	Is theoretical length of cut (TLC) adjusted at harvest?	Yes		No			
2.	Is particle size assessed at harvest?	Yes		No			
3.	Crop dry matter at harvest?	35-45%		<35% or >45%			
4.	Crop maturity at harvest?	At late bud stage or earlier.	Between late bud stage and 10% flower	Greater than 10% flower			
5.	Harvest completed rapidly with no evidence of spoilage between harvests?	Yes		No			
STORAGE ISSUES					LOW	MOD	HIGH
1.	Silo Covering?	Bunker covered with plastic > 80-100% of plastic covered with tires or other materials. Spoilage on top of bunker is minimal.	Bunker covered with plastic but some evidence of leakage and spoiled silage on top of bunker.	Bunker not covered or cover is ineffective. >4" spoiled haylage on top of silo.			
2.	Silo Density?	>14 lb/ft ³	14-11 lb/ft ³	<11 lb/ft ³			
3.	Silo well drained and excess feed cleaned up regularly?	Yes		No			
4.	Silage is fed at a rate so that heating and spoilage are not occurring at the silage face?	Yes		No			
5.	Is bunk face managed uniformly?	Yes		No			

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		Low Limitation	Moderate Limitation	High Limitation	(Low	Moderate	High)
ALFALFA HAYLAGE—BAG OR TUBE							
CROPPING ISSUES					LOW	MOD	HIGH
1.	Is hay silage more than 50% alfalfa?	Yes		No			
2.	Weeds controlled?	Yes		No			
3.	Insect or disease damage evident at harvest?	No		Yes			
HARVESTING ISSUES					LOW	MOD	HIGH
1.	Is Theoretical length of cut (TLC) adjusted at harvest?	Yes		No			
2.	Particle size assessed at harvest?	Yes		No			
3.	Crop dry matter at harvest?	35-45%		<35% or >45%			
4.	Crop maturity at harvest?	At late bud stage or earlier.	Between late bud stage and 10% flower	Greater than 10% flower			
5.	Time between baling and wrapping or putting in tube?	<1 day		> 1 day			
STORAGE ISSUES					LOW	MOD	HIGH
1.	Few or no holes in plastic?	Yes		No			
2.	Uniform fill with few lumps or air cavities?	Yes		No			
3.	Silo well drained and excess feed cleaned up regularly?	Yes		No			
4.	Silage is fed at a rate so that heating and spoilage are not occurring at the silage face?	Yes		No			

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	1	2	3	Limitation	Ranking	
	Low Limitation	Moderate Limitation	High Limitation	(Low	Moderate	High)

GRASS HAYLAGE—TOWER SILO





































CROPPING ISSUES				LOW	MOD	HIGH
1.	Weeds controlled?	Yes	No			
2.	Insect or disease damage evident at harvest?	No	Yes			
HARVESTING ISSUES				LOW	MOD	HIGH
1.	Is Theoretical length of cut (TLC) adjusted at harvest?	Yes	No			
2.	Particle size assessed at harvest?	Yes	No			
3.	Crop dry matter at harvest?	35-45%	<35% or >45%			
4.	Crop maturity at harvest?	At boot or less.	Between boot and 50% flower			
5.	Harvest completed rapidly with no evidence of spoilage between harvests?	Yes	No			
STORAGE ISSUES				LOW	MOD	HIGH
1.	Silo integrity?	Silo well sealed. No evidence of seepage.	Leaking just noticeable around doors and walls. Minimal seepage.			
2.	Silage evenly distributed?	Yes	No			
3.	Silage depth?	Depth of haylage greater than 40 feet in last fill.	Depth of haylage 30-40 feet in last fill.			
4.	Is heating occurring prior to feedout?	No	Yes			

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	1	2	3	Limitation	Ranking	
	Low Limitation	Moderate Limitation	High Limitation	(Low	Moderate	High)

GRASS HAYLAGE—BUNKER SILO

				LOW	MOD	HIGH	
CROPPING ISSUES							
1.	Weeds controlled?	Yes	No				
2.	Insect or disease damage evident at harvest?	No	Yes				
HARVESTING ISSUES							
1.	Is Theoretical length of cut (TLC) adjusted at harvest?	Yes	No				
2.	Particle size assessed at harvest?	Particle size assessed at harvest and at feedout	Particle size adjusted at harvest	Particle size not monitored			
3.	Crop dry matter at harvest?	35-45%	<35% or >45%				
4.	Crop maturity at harvest?	At boot or less	Between boot and 50% flower	Greater than 50% flower			
5.	Harvest completed rapidly with no evidence of spoilage between harvests?	Yes	No				
STORAGE ISSUES							
1.	Silo Covering?	Bunker covered with plastic > 80-100% of plastic covered with tires or other materials. Spoilage on top of bunker is minimal.	Bunker covered with plastic but some evidence of leakage and spoiled silage on top of bunker	Bunker not covered or cover is ineffective. >4" spoiled haylage on top of silo			
2.	Silo Density?	>14 lb/ft ³	14-11 lb/ft ³	<11 lb/ft ³			
3.	Silo well drained and excess feed cleaned up regularly?	Yes	No				
4.	Silage is fed at a rate so that heating and spoilage are not occurring at the silage face?	Yes	No				
5.	Is bunk face managed uniformly?	Yes	No				

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	1 Low Limitation	2 Moderate Limitation	3 High Limitation	Limitation (Low	Ranking Moderate	High)
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GRASS HAYLAGE—BAG OR TUBE

CROPPING ISSUES				LOW	MOD	HIGH	
1.	Weeds controlled?	Yes	No				
2.	Insect or disease damage evident at harvest?	No	Yes				
HARVESTING ISSUES				LOW	MOD	HIGH	
1.	Theoretical length of cut (TLC) adjusted at harvest?	Yes	No				
2.	Particle size assessed at harvest?	Yes	No				
3.	Crop dry matter at harvest?	35-45%	<35% or >45%				
4.	Crop maturity at harvest?	At boot or less.	Between boot and 50% flower	Greater than 50% flower			
5.	Time between baling and wrapping or putting in tube?	< 1 day	> 1 day				
STORAGE ISSUES				LOW	MOD	HIGH	
1.	Few or no holes in plastic?	Yes	No				
2.	Uniform fill with few lumps or air cavities?	Yes	No				
3.	Silo well drained and excess feed cleaned up regularly?	Yes	No				
4.	Silage is fed at a rate so that heating and spoilage are not occurring at the silage face?	Yes	No				














































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		Low Limitation	Moderate Limitation	High Limitation	(Low	Moderate	High)
CORN SILAGE—TOWER SILO							
CROPPING ISSUES				LOW	MOD	HIGH	
1.	Crop impacted significantly by drought?	No		Yes			
2.	Crop planted later than average for the area?	No		Yes			
3.	Hybrids selected for low NDF or high NEL?	Yes		No			
4.	Plant populations?	Plant populations < 30,000 per acre	Plant populations 30,000-34,000/acre	Plant populations >34,000/acre			
5.	Weeds controlled?	Yes		No			
HARVESTING ISSUES				LOW	MOD	HIGH	
1.	Theoretical length of cut (TLC) adjusted at harvest?	Yes		No			
2.	Particle size assessed at harvest?	Yes		No			
3.	Crop dry matter at harvest?	32-40%		>40% or <32%			
4.	Crop maturity at harvest?	1/4 to 3/4 milk line	Full dent to 1/4 milk line or 3/4 milk line to Black layer	Prior to full dent (immature and frosted) or after black layer			
5.	Harvest completed rapidly with no evidence of spoilage between harvests?	Yes		No			
STORAGE ISSUES				LOW	MOD	HIGH	
1.	Silo integrity?	Silo well sealed. No evidence of seepage.	Leaking just noticeable around doors and walls. Minimal seepage.	Widespread evidence of air penetration in silo or seepage			
2.	Silage evenly distributed?	Yes		No			
3.	Silage depth?	Depth of silage >40 feet in last fill.	Depth of silage 30-40 feet in last fill.	Depth of silage <30 feet in last fill.			
4.	Is heating occurring prior to feedout?	No		Yes			

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		1	2	3	Limitation	Ranking	
		Low Limitation	Moderate Limitation	High Limitation	(Low	Moderate	High)
CORN SILAGE—BUNKER SILO							
CROPPING ISSUES					LOW	MOD	HIGH
1.	Crop impacted significantly by drought?	No		Yes			
2.	Crop planted later than average for the area?	No		Yes			
3.	Hybrids selected for low NDF or high NEL?	Yes		No			
4.	Plant populations?	Plant populations < 30,000 per acre	Plant populations 30,000-34,000/acre	Plant populations >34,000/acre			
5.	Weeds controlled?	Yes		No			
HARVESTING ISSUES					LOW	MOD	HIGH
1.	Theoretical length of cut (TLC) adjusted at harvest?	Yes		No			
2.	Particle size assessed at harvest?	Yes		No			
3.	Crop dry matter at harvest?	30-35%		>35% or <30%			
4.	Crop maturity at harvest?	1/4 to 3/4 milk line	Full dent to 1/4 milk line or 3/4 milk line to Black layer	Prior to full dent (immature and frosted) or after black layer			
5.	Harvest completed rapidly with no evidence of spoilage between harvests?	Yes		No			
STORAGE ISSUES					LOW	MOD	HIGH
1.	Silo Covering?	Bunker covered with plastic > 80-100% of plastic covered with tires or other materials. Spoilage on top of bunker is minimal.	Bunker covered with plastic but some evidence of leakage and spoiled silage on top of bunker.	Bunker not covered or cover is ineffective. >4" spoiled silage on top of silo.			
2.	Silo Density?	>14 lb/ft ³	14-11 lb/ft ³	<11 lb/ft ³			
3.	Silo well drained and excess feed cleaned up regularly?	Yes		No			
4.	Silage is fed at a rate so that heating and spoilage are not occurring at the silage face?	Yes		No			
5.	Is bunk face managed uniformly?	Yes		No			

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		Low Limitation	Moderate Limitation	High Limitation	(Low	Moderate	High)
CORN SILAGE— HORIZONTAL BAG SILO							
CROPPING ISSUES					LOW	MOD	HIGH
1.	Crop impacted significantly by drought?	No		Yes			
2.	Crop planted later than average for the area?	No		Yes			
3.	Hybrids selected for low NDF or high NEL?	Yes		No			
4.	Plant populations?	Plant populations < 30,000 per acre	Plant populations 30,000-34,000/acre	Plant populations >34,000/acre			
5.	Weeds controlled?	Yes		No			
HARVESTING ISSUES					LOW	MOD	HIGH
1.	Theoretical length of cut (TLC) adjusted at harvest?	Yes		No			
2.	Particle size assessed at harvest?	Yes		No			
3.	Crop dry matter at harvest?	30-40%		>40% or <30%			
4.	Crop maturity at harvest?	1/4 to 3/4 milk line	Full dent to 1/4 milk line or 3/4 milk line to Black layer	Prior to full dent (immature and frosted) or after black layer			
5.	Harvest completed rapidly with no evidence of spoilage between harvests?	Yes		No			
STORAGE ISSUES					LOW	MOD	HIGH
1.	Few or no holes in plastic?	Yes		No			
2.	Uniform fill with few lumps or air cavities?	Yes		No			
3.	Silo well drained and excess feed cleaned up regularly?	Yes		No			
4.	Silage fed at a rate so that heating and spoilage are not occurring at the silo face?	Yes		No	