



NNY Dairy Team

April 2013

Forages: From Field to Silo — 2013 Update
Preserving every ton of forage per acre you harvest

By Ron Kuck, rak76@cornell.edu

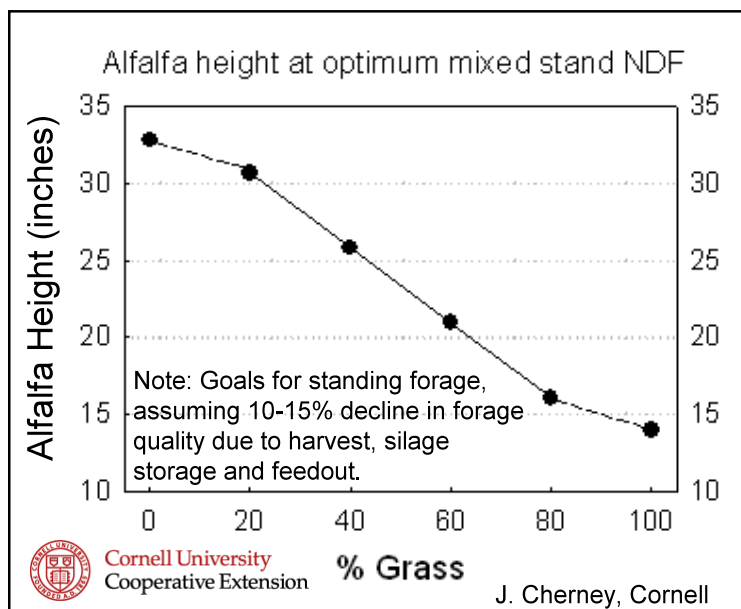
Storage losses can be staggering without the proper techniques and preservation tools. Silage loss from field to feed bunk is 5-10%. In the most ideal situation achieving shrink of 10% at the bunk is achievable, but losses of 30% are common and 50% still happens.

Forage quality factors you cannot control:

- weather, and
- equipment breakdowns (provided you did maintenance this winter)

The 6 Forage quality factors you can control:

1. Harvest at optimum maturity



Goal % NDF

NDF (Neutral Detergent Fiber) is by far the best predictor available to determine forage quality for lactating dairy cows. NDF content in the field is best predicted by using alfalfa height for both alfalfa and grasses. (See Chart)

Grasses the goal is an NDF level (on a dry matter basis) is 50% (target range 48-55). Tallest alfalfa height will be 16-17 inches.

Alfalfa the goal is an NDF level of 40% (target range 39-43). Tallest alfalfa height will be 28-30 inches.

Mixed stand of 50% grass and 50% alfalfa the goal is an NDF level of 43%. Tallest alfalfa height will be 22-23 inches.

Begin harvest early enough so that most of your crop is harvested by the "ideal" range.

Typically NDF increases about 0.5 to 0.7/day for alfalfas and about 0.8 to 1.2/day for grass. Expect the lower end of that range in cooler weather and the higher end in warm.

This pocket guideline is available from your Extension office. Everyone on your team should have one.

Access Alfalfa Height Reporting Every Wednesday:

Each Wednesday throughout the 2013 season, Cornell Cooperative Extension of Jefferson County will report alfalfa height from various locations in the county. Contact Ron Kuck rak76@cornell.edu or 315-704-8810 to indicate if you would like to receive the report by e-mail or text message.

2. Harvest at correct DM and chop length

Forage particle size & moisture	Alfalfa	Grass	Small grains
Stage of maturity	See Chart#1	See Chart#1	Boot or soft dough
Theoretical cut length (inch)	3/8–1/2	3/8–1/2	3/8–1/2
Moisture by storage structure			
Horizontal silo	30-35%	32-38%	30-40%
Pile or stack	30-35%	32-38%	30-40%
Conventional upright	35-40%	35-40%	32-27%
Oxygen-limiting upright	45-60%	45-60%	40-45%
Bag	40-60%	40-60%	40-45%
Balage	40-50%	40-50%	45-60%

3. Use inoculants or preservatives:

- Good fit for hay crop silages
- Provide insurance that forages will ferment properly
- Inoculate with a minimum of 100,000 colony-forming units (cfu) of lactic acid producing bacteria at ensiling.
- Propionic acid based products added at a rate of 2-4 lbs. /ton of 35% DM silage.

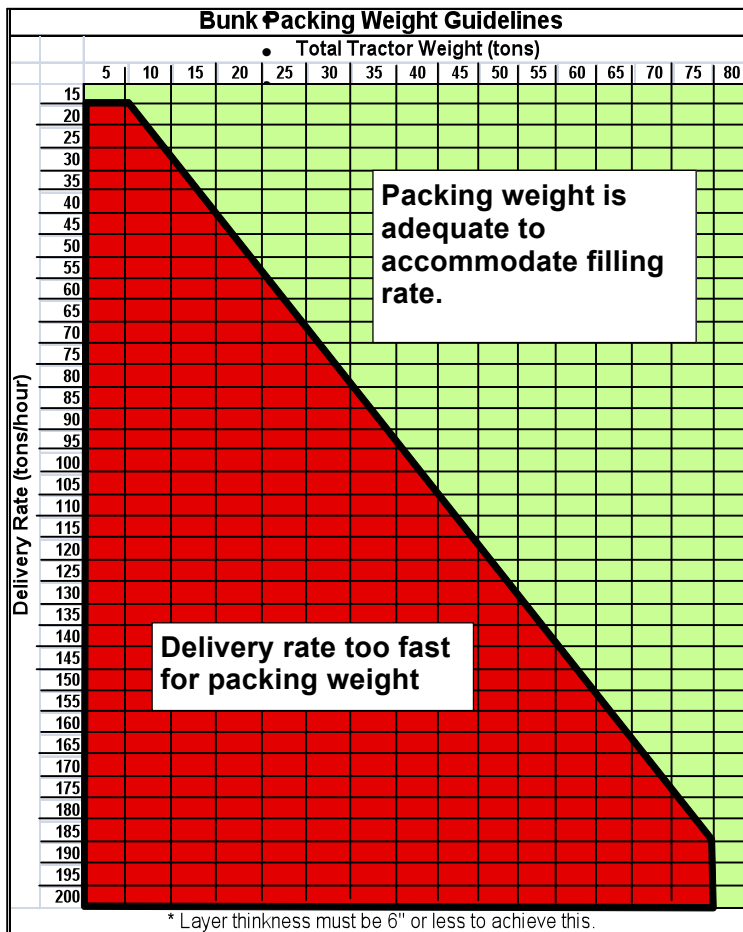
4. Fill and pack forage effectively: filling silos as rapidly as possible reduces silage exposure to air and rainfall

- Use proper shape and size: bunk side slope should be 3:1 horizontal:vertical



Bunks should be packed from back to front and side to side. Never fill over the top of the bunk with sidewalls. The bunk on the right needs shallower side slopes.

- Achieve a Higher Silage Density (see chart on next page)
 - The goal for bunk silos & bags is at least 15 lbs. DM per cubic foot
 - Higher packing density lowers shrink loss. (Don't overpack bags!)
 - Every 1#DM/cu foot increase in density reduces shrink by 2%
 - If weight of tractors limits packing:
 - Slow down delivery OR add tractors and weights. These can be built on farm or purchased. These weigh 7800 lbs. or more. A popular option!



Total Tractor Weight	Optimum Filling Rate
Tons	Tons/Hr.
15	40
20	50
25	60
30	75
35	90
40	100
45	115
50	125
55	140
60	150
65	165
70	175
75	190
80	200

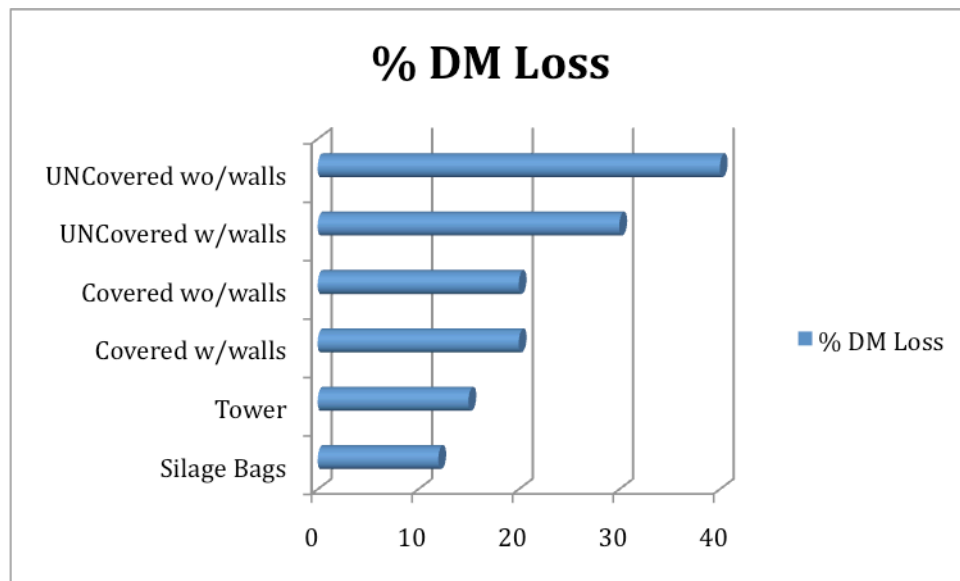
Other alternative packing methods



5. Cover and seal

Main reasons for shrink: uncovered bunks, leaky uprights, ripped Ag Bags

- Use 6-8 mil thick polyethylene plastic containing ultraviolet light protection
- Use new oxygen barrier cover with much lower oxygen permeability than polyethylene
- A second layer of plastic or a tarp is used on top to protect thin plastic to reduces dry matter loss at the top of the silage by 50%; reduces total shrink loss by 2-5%



6. Manage the feed out (Chart #6)

Smooth, firm silage face feed-out at an appropriate rate reduces silage losses

Bunkers - Recommended removal rates are 6 inches/day or greater

Bags - Remove at least 6 inches/day.

Tower silos – Remove at least 4 inches/day

Feed out losses with tower silos can occur a few different ways

- Losses due to wind can be high if the silage is directed into a conveyor with no protective shelter, covers, leaking drop pans or liners
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Percent feeding loss by silage storage system². Penn State University Circular 396, "Harvesting and Utilizing Forage", October 1993

Storage System	Feeding Loss (dry matter %)
Bunker/Silage Bag (less than 5"/day)	11
Bunker/Silage Bag (more than 5"/day)	5
Tower Silo (less than 3"/day; windy, leaky conveyors)	11
Tower Silo (more than 4"/day)	4

7. The Customer is always right!



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