Managing equipment during harvest to minimize quality and yield loss

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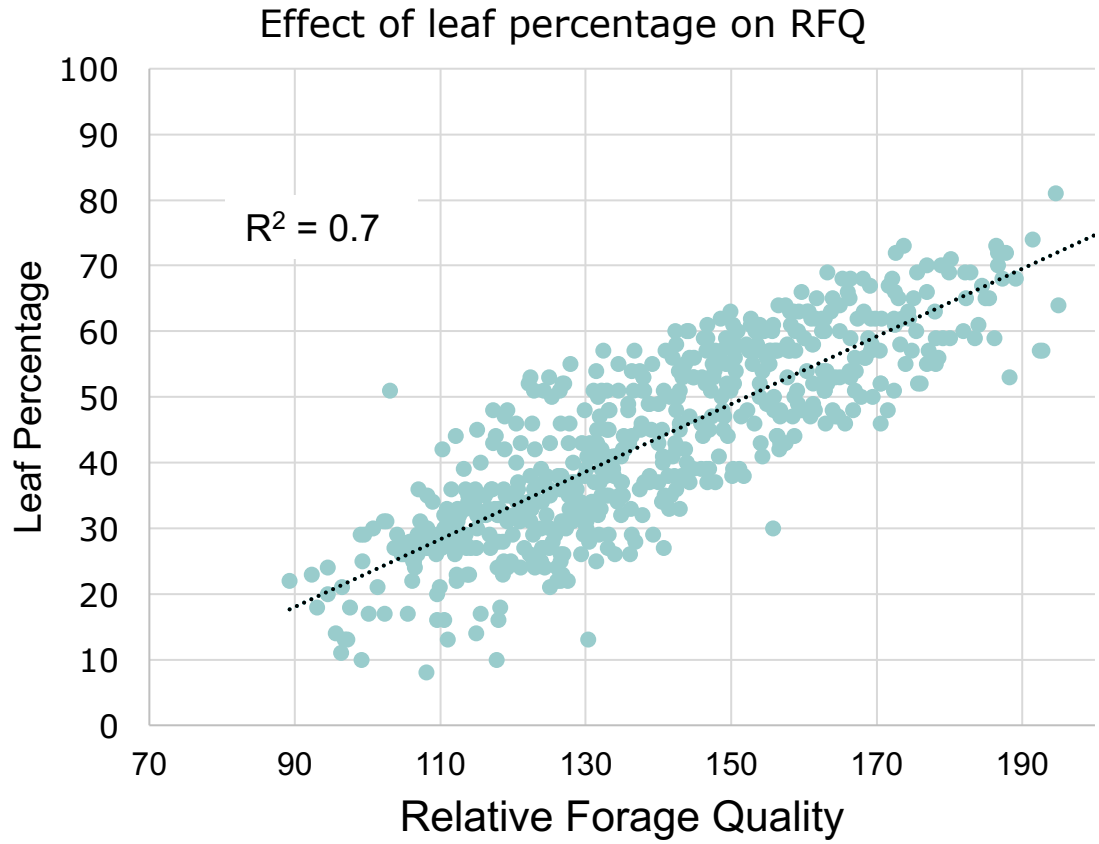
Alfalfa Leaf Loss Effect on Forage Quality

- Leaves higher in quality than stems

Leaves 15 to 20% NDF
~ 450 RFQ

Stems 60 to 70% NDF
~ 70 RFQ



Factors Reducing Forage Quality

- Ash content

- Ash provides minerals to the diet, but no calories (i.e. energy).
- Takes the place of nutrients on almost a 1:1 basis.
- Ash content above that contained in plant is dirt contamination

TDN= tdNFC + tdCrude Protein + tdFA*2.25 + tdNDF – 7

NFC = 0.98 * (100 - [(NDF-NDICP) + CP + EE + Ash])

Effect of ash on forage quality

Ash content (%)	RFQ	Milk/t
8	164	2826
10	159	2656
12	154	2485
15	147	2362

Possible Causes of Higher Levels of Ash in Forages

Disk Cutterbar

Cutting height

Disc Mower knife type

Those knives that “pick up hay” better, also pick up more ash

Cutting height

- Lower cutting results in more yield
  - 0.5 t/a per year for each inch of alfalfa
- Lower cutting height shortens stand life of grasses
  - Especially smooth bromegrass, orchardgrass, timothy
- Lower cutting height reduces forage quality
  - 5 points RFV per inch
- Lower cutting height increases ash with disc mowers
- Best compromise is generally 2.5 to 3” cutting height

Tedding, Raking, Merging

Factors Reducing Forage Quality

- Ash content

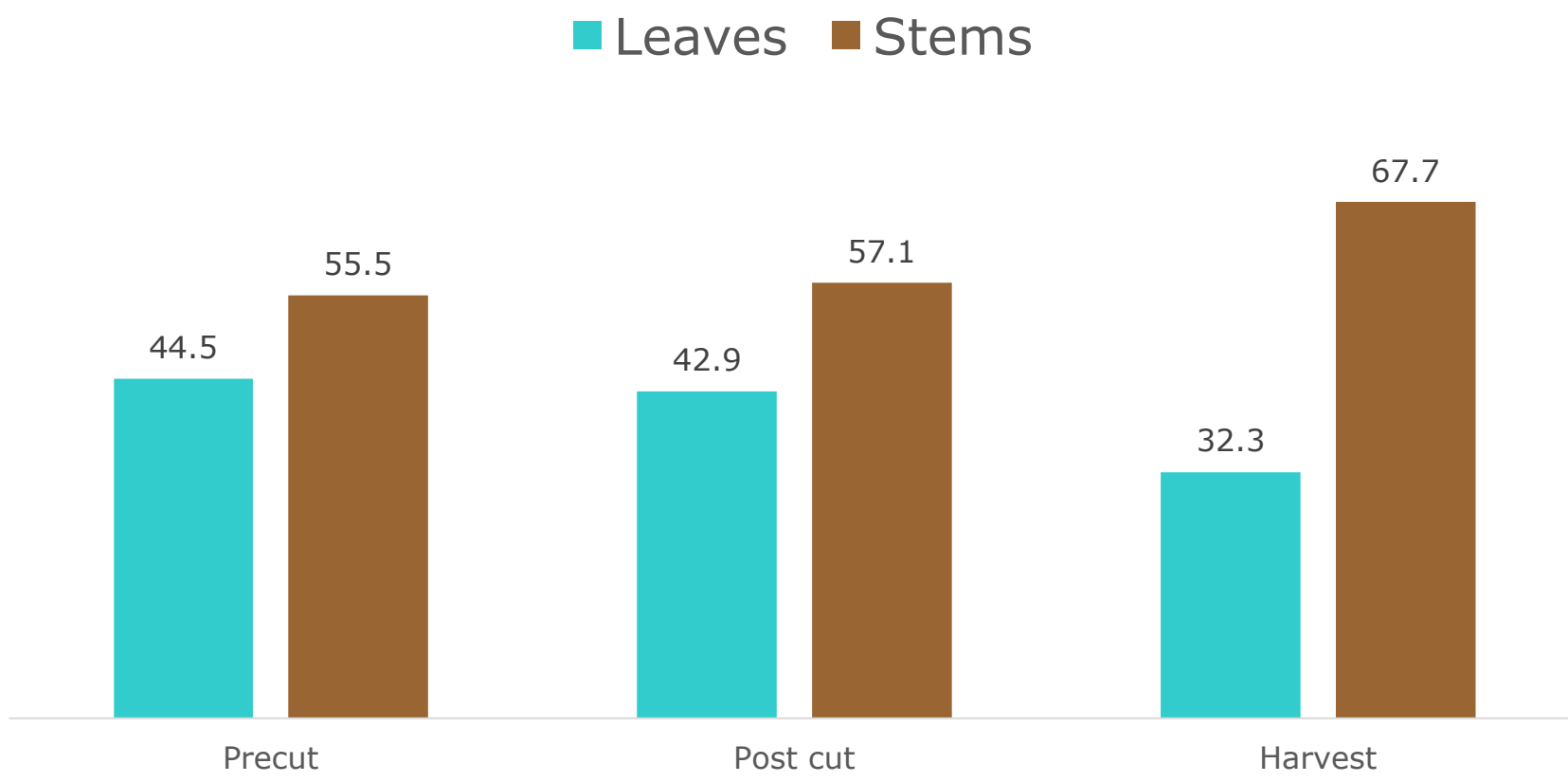
Rake properly

- Keep forage on top of stubble
- Rake
  - So tines do not touch ground
  - Move horizontally across ground as little as possible
    - i.e. move two swaths on top of third in middle rather than rake all to one side.
- Merger will result in less loss than rake.

Factors Reducing Forage Quality

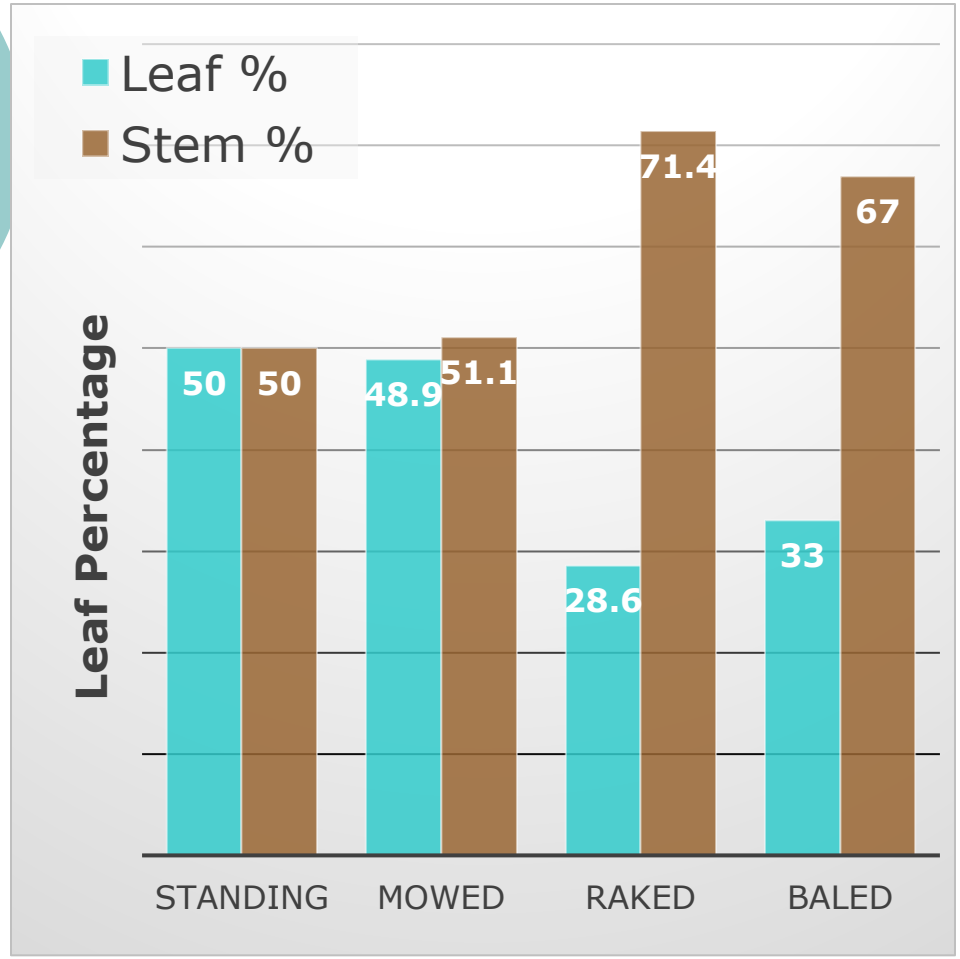
- Ash content
- Leaf loss
  - Disease on standing crop
  - During harvesting

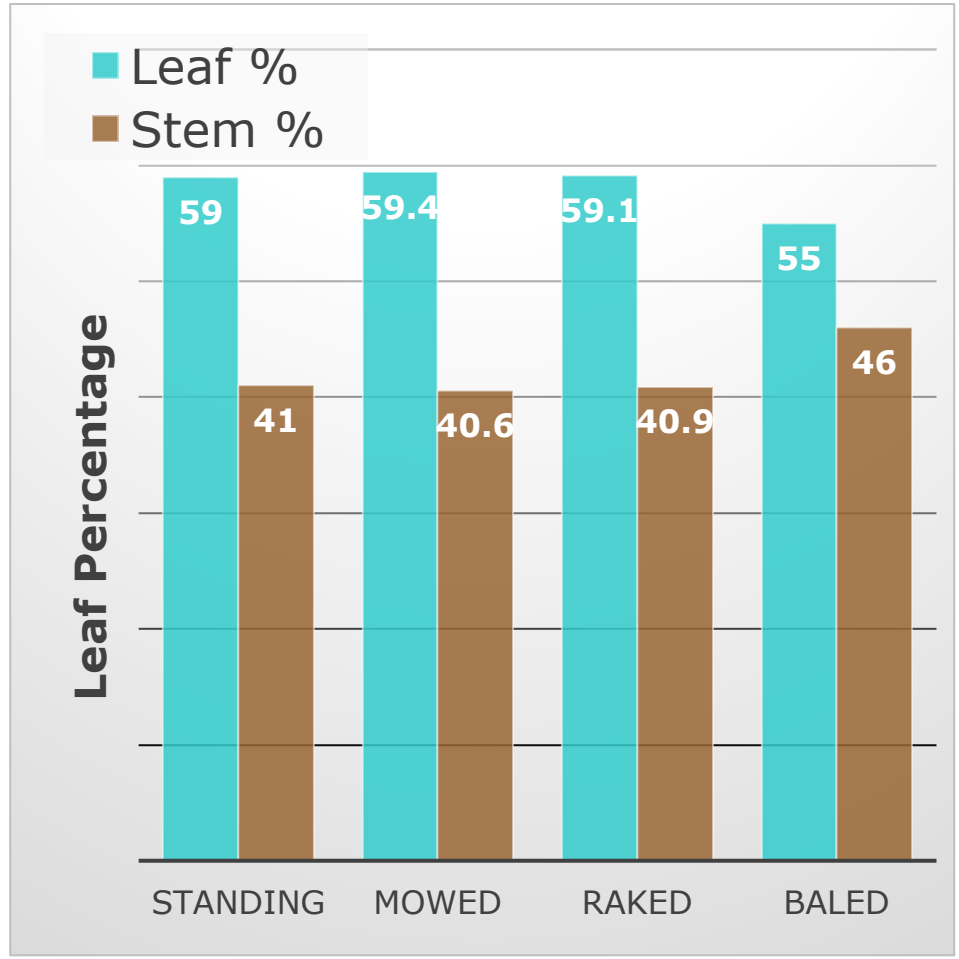
Leaf Content at Harvesting Stages



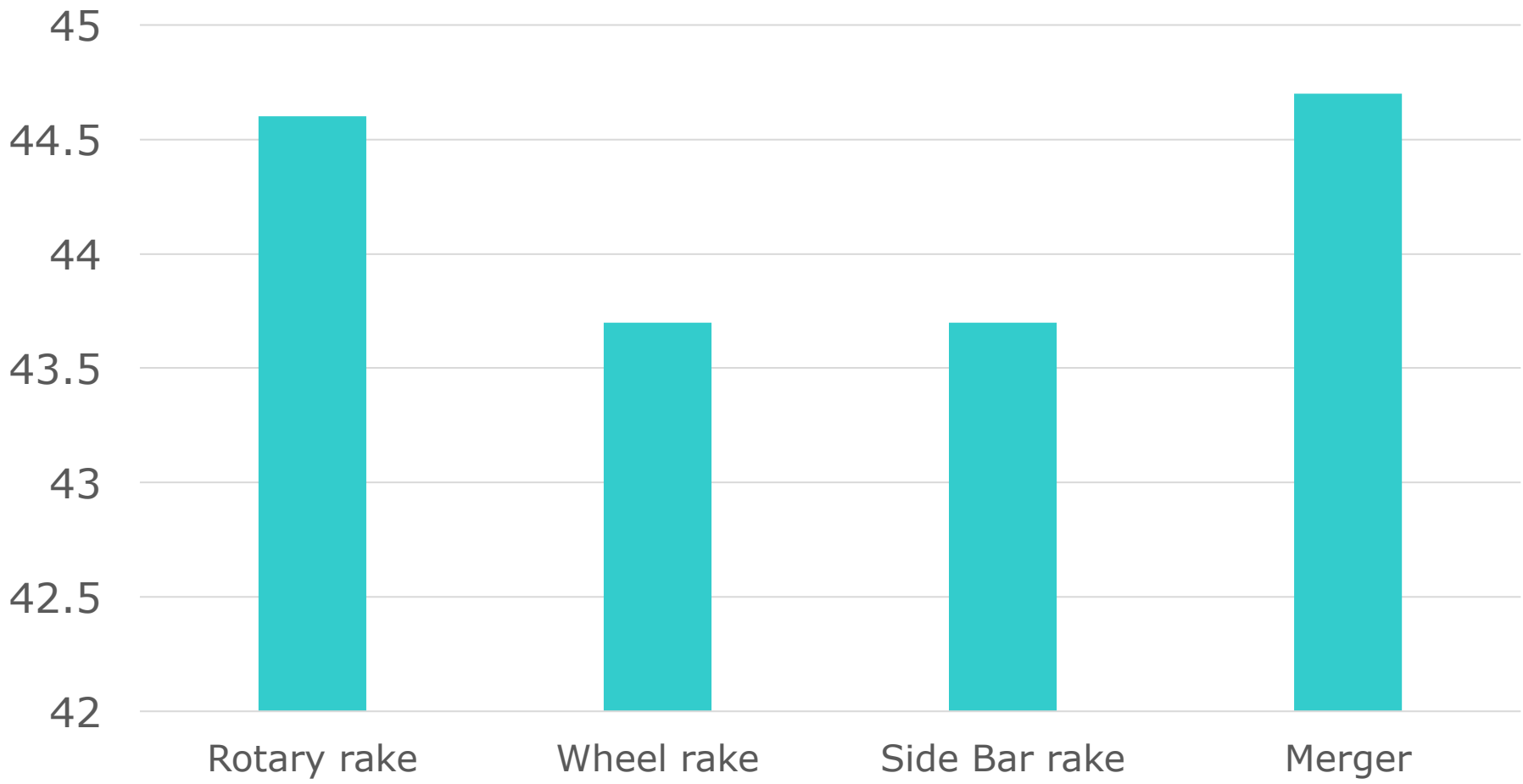
Data from Winfield, 2016

Three-state rake/merger trial, 2015



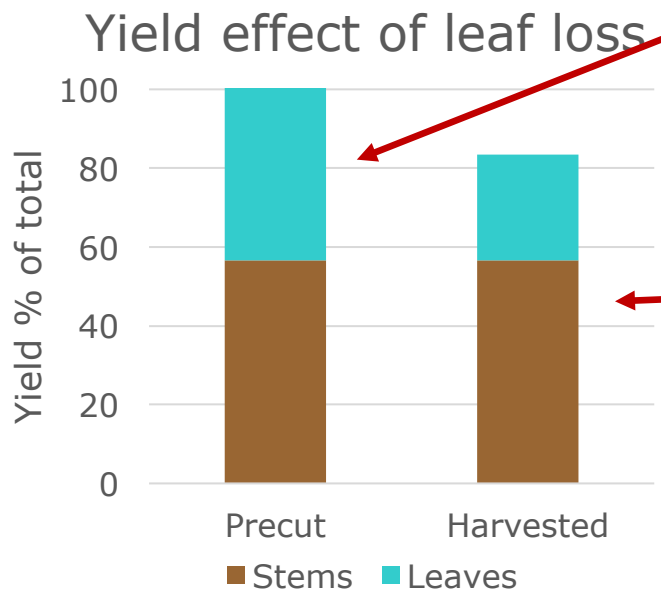


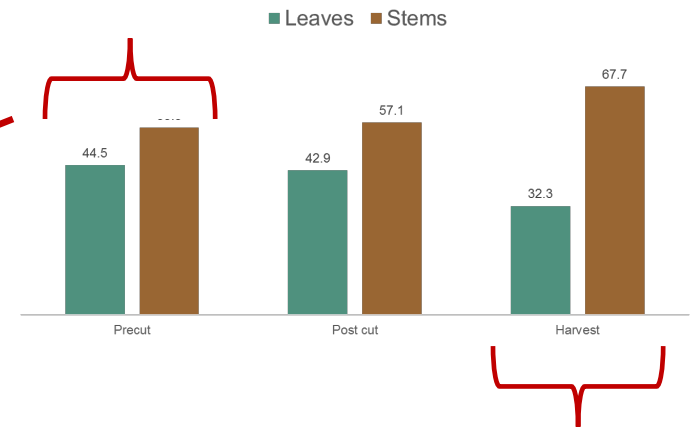
Three state rake/merger trial, 2015



Retaining leaves increases yield

- Reduced leaf loss
  - 5 to 20% yield reduction



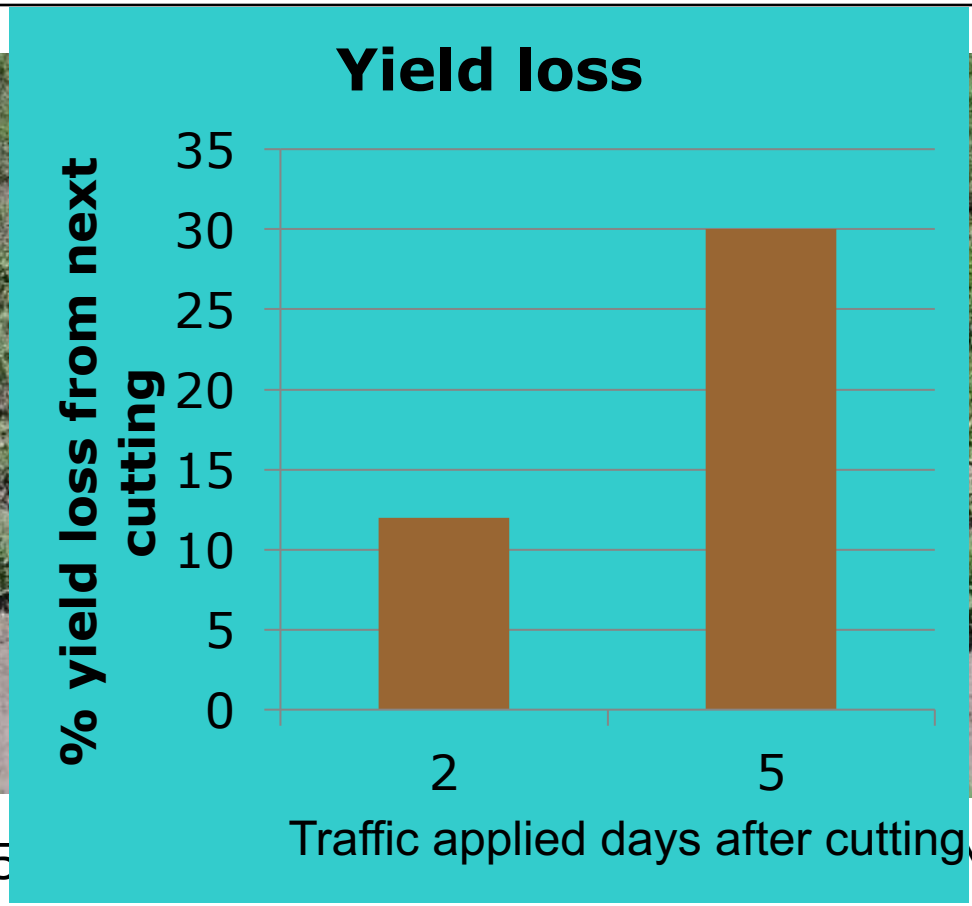


Increasing Yield

- Reduced leaf loss
  - 5 to 20% yield reduction
- Reduced wheel traffic

Remove hay/haylage from field rapidly to minimize wheel traffic damage

Wheel traffic 5



No wheel traffic

Alfalfa regrowth 10 days after cutting

Cutter bar width effect on wheel traffic

Percentage of field covered with wheel traffic during harvesting

- ✓ Mowing
  - 10’ mower
    - Two tractor tires (20’’) and two mower tires 15’ = 70”/120” = 58%
- ✓ Raking/merging
  - If 10’
    - 58%
  - If 20’
    - 29%
- ✓ Baling/chopping
    - 29% plus traffic to haul wagon/truck or bales off field

% trafficked	
58	58
58	29
29	29
145	116

Percentage of field covered with wheel traffic during harvesting

- ✓ Mowing
  - 13’ mower
    - Two tractor tires (20’’) and two mower tires 15’ = 70”/192” = 44%
- ✓ Raking/merging
  - If 13’
    - 44%
  - If 26’
    - 22%
- ✓ Baling/chopping
    - 22% plus traffic to haul wagon/truck or bales off field

% trafficked	
44	44
44	22
22	22
110	88

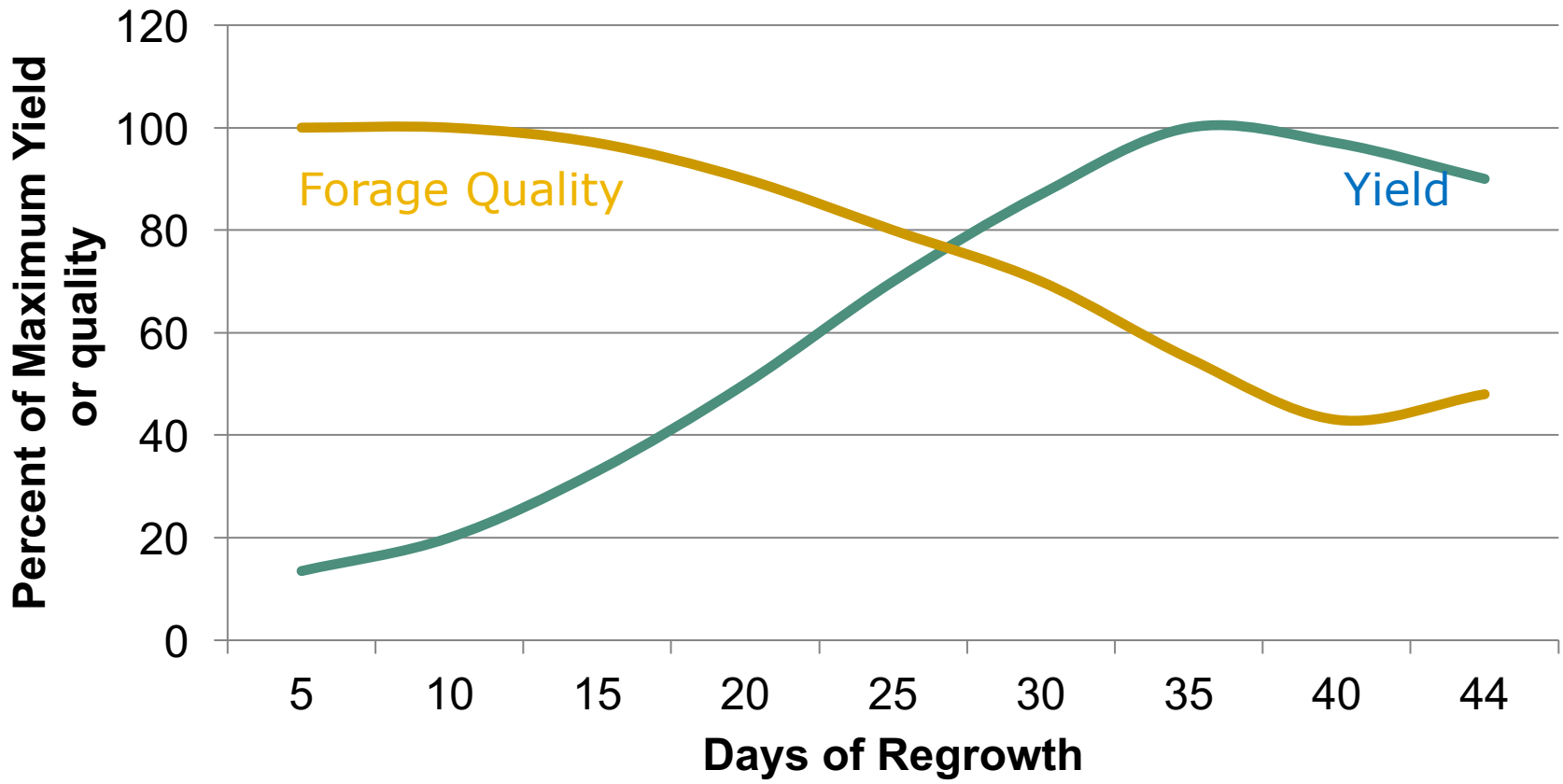
Mowed swaths in pairs

Effect of cutter bar width on alfalfa yield

Year	Cutter bar width	Yield increase /year
2001	9’ vs 12’	0.5 t dm
2014	10’ vs 13’	0.5 t dm
2016	10’ vs 13’	1.0 t dm

Contract harvesting

Yield and Quality Curve of Alfalfa

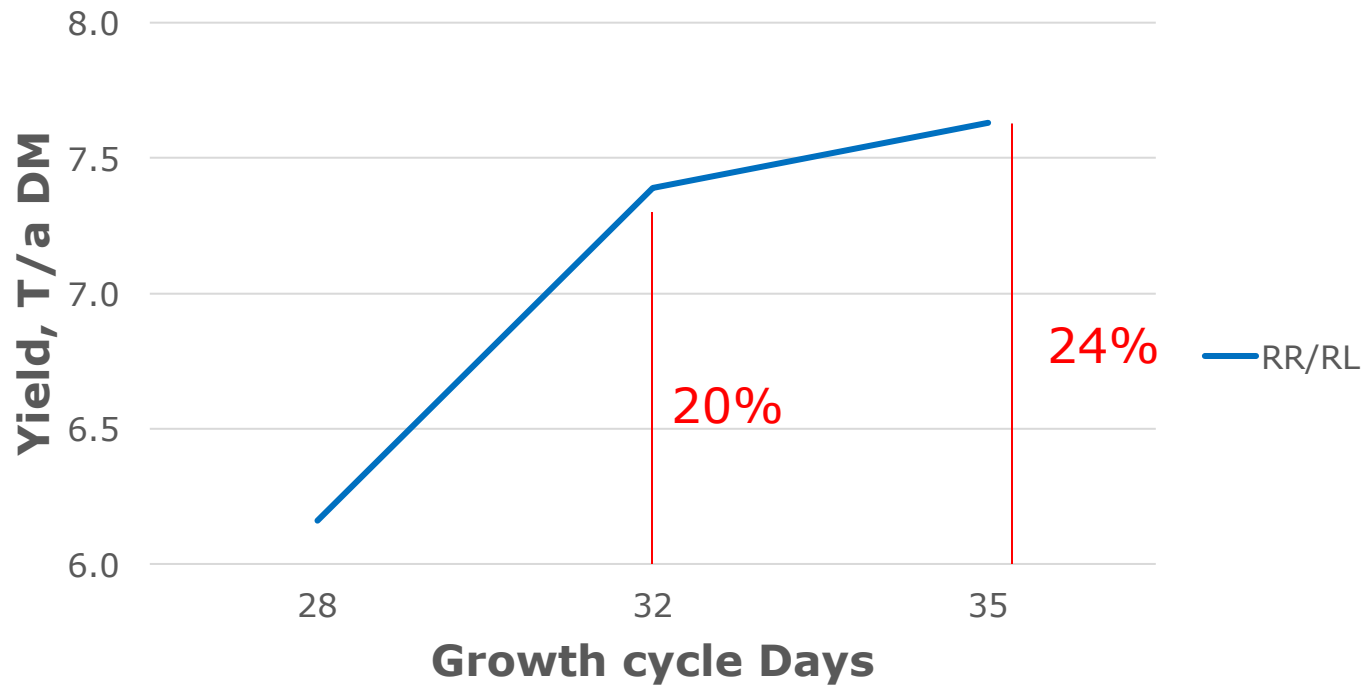


3 vs 4 cutting by Sept 1 effect on alfalfa yield, Arlington, Wisconsin

		1st cutting	2nd cutting	3rd cutting	4th cutting	Season Total	
2nd year	3 cut	2.97	2.43	2.15	----	7.55	17%
	4 cut	1.66	1.48	1.71	1.68	6.53	
3rd year	3 cut	2.32	1.53	1.24	----	5.09	25%
	4 cut	1.31	1.18	0.75	0.83	4.07	

Effect of harvest delay on alfalfa yield, total of 4 cuttings, Wisconsin 2015

Alfalfa adds about 150 lbs dm/a/day near harvest



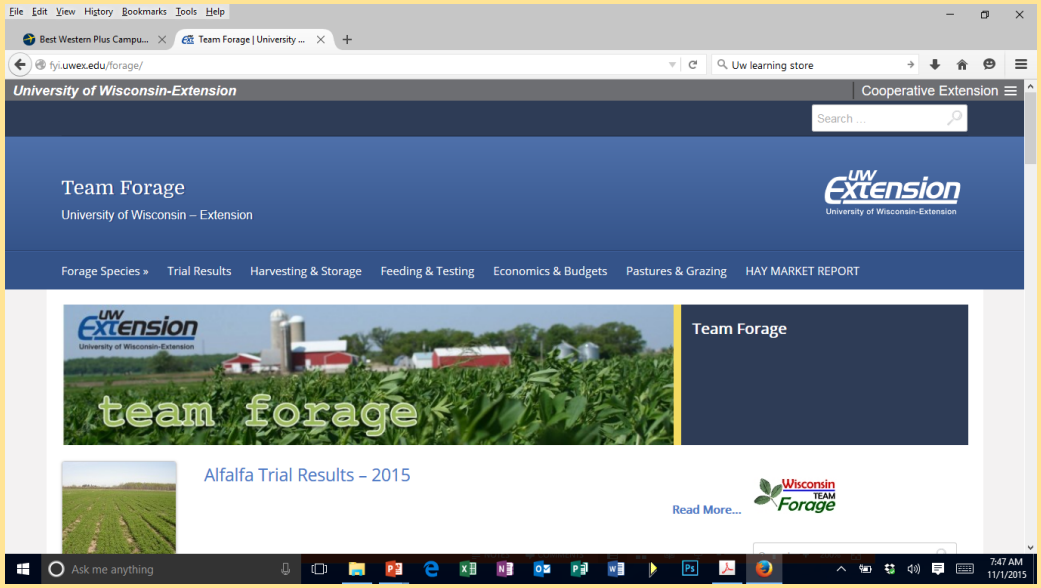
Make better use of full growing season

- Cutting schedule
  - May 20
  - June 20
  - July 20
  - August 20

  - Could grow until September 5
    - 16 days * 150 lb/a = 2.4 t/a

For Additional Information

fyi.uwex.edu/forage



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