

Cover Crops, Forages, and Grazing

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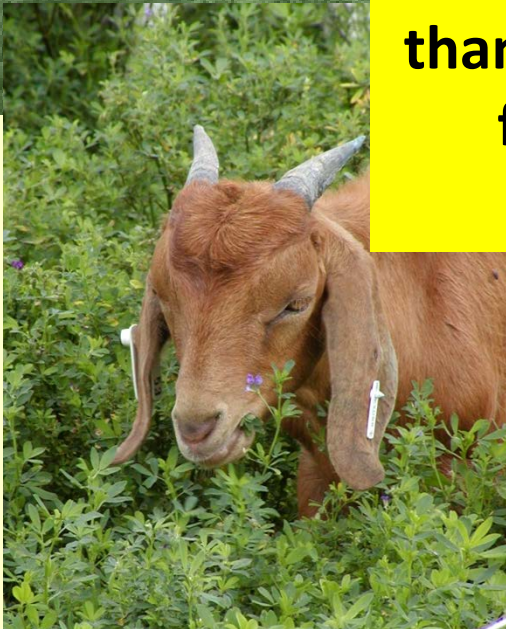
**Can we use cover crops as forages?
All forages are cover crops**



All cover crops are forages



Forage = “edible parts of plants, other than separated grain, that can provide feed for animals, or that can be harvested for feeding”





**Why do people think cover crops
can't be harvested?**



Crop Insurance

NRCS Cover Crop Management and Termination Guidelines

[/www.nrcs.usda.gov/wps/portal/nrcs/main/national/landuse/crops/](http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/landuse/crops/)

- *“Cover crops may be grazed or harvested as hay or silage, unless prohibited by RMA crop insurance policy provisions.”*
- *Approved termination methods: frost, chemical application, crimping, rolling, tillage, cutting*

Grazing is NOT a standard method of cover crop termination

- Does not guarantee all growth has ended
- Exceptions possible as “new technology” or “acceptable deviation” based on individual farm records.

WORK WITH YOUR INSURANCE AGENT!

Soil Compaction

Does hoof or wheel traffic cancel out soil structure benefit of cover crop?

It depends...

- **Surface compaction can occur if animals are present while ground is wet**
- **Freeze-thaw cycle tends to correct the compaction**

Methods to reduce compaction risk from harvesting cover crops

- 1) Use no-till**
- 2) Stay off wet ground**
- 3) Graze while ground is frozen**
- 4) Use managed grazing to prevent concentrated animal traffic for extended time – rotation, move supplement/water sources**

Pesticides

- **Pesticides used on row crops may have long residual with grazing/forage harvest restriction that extends into cover crop period**
- **Pesticides used on cover crop itself may not be labeled for grazing or harvested forage**

What else could go wrong?

Universal concerns (pasture, hay, silage)

- Weeds – ryegrasses, cereal rye, hairy vetch, buckwheat
- Nitrate toxicity – sorghums, small grains, brassicas
- Photosensitization – buckwheat

Concerns on pasture only

- Bloat – wheat, annual clovers, medics, brassica
- Photosensitization – immature forage rape
- Neurological problems/dermatitis – hairy vetch
- Prussic acid poisoning – sorghum, sudangrass

Concerns with hay/silage only

- Vitamin K deficiency – sweetclover hay or silage (moldy)
- High moisture content -- brassicas

How is grazing different from harvesting?

Grazing “harvests” less biomass (25-75% utilization)

Grazing returns most nutrients to the field

- **50% of N**
- **85% of P and K**
- **Much of returned nutrient is in plant-available forms**
- **Nutrients are spatially redistributed**

Hoof traffic is different from wheel traffic

Grazing requires animals, fence, water, and different management skills

**Livestock and cover crops
(row crops) often are not on the
same farm.**



Characteristics of ideal cover crops for forage

- 1) Fast-growing, vigorous seedlings**
- 2) Reach harvestable biomass within 60 days**
- 3) Does not self-seed**
- 4) Acceptable nutritive value (energy, protein, minerals) for intended livestock**
- 5) Manageable toxicity risk to livestock**
- 6) Regrowth after harvest**
- 7) Easy to terminate**
- 8) Acceptable preservation characteristics as hay or silage**

Good cover crop forage choices for Midwest

Brassicas



Sorghums



Small grains

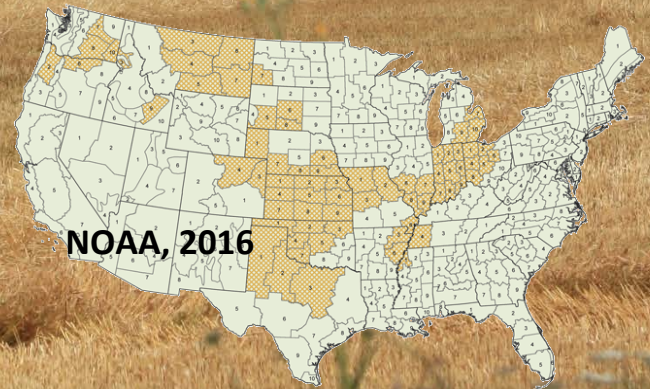


Wheat

60-90 day window for growing cover crop as forage



Winter Wheat Belt



Frost-seeded red clover - mowed and unmowed

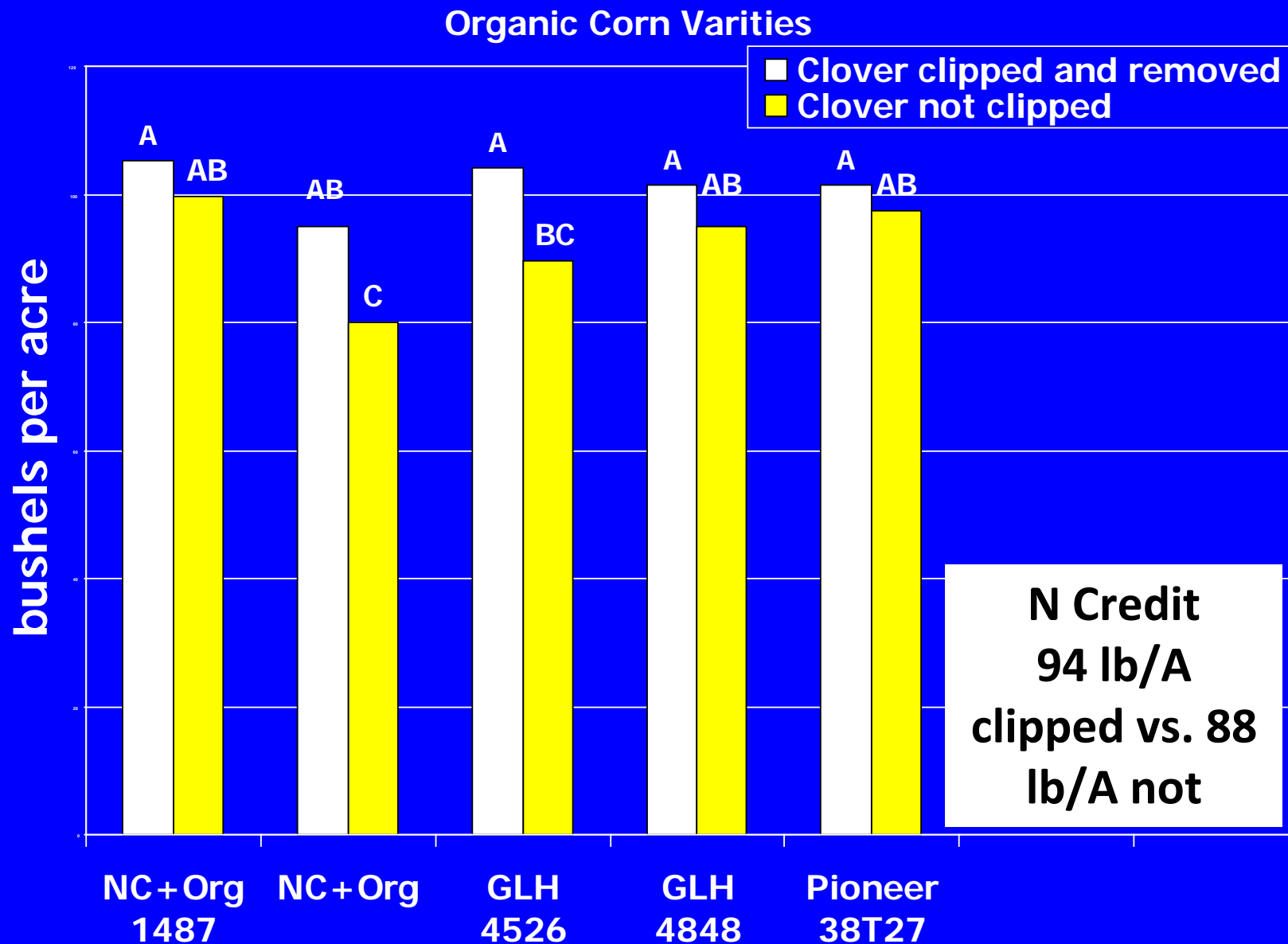




Not Mowed

Mowed

Spring 2001



Cover Crops as Haylage after Wheat -- Treatment Sequence --



Year 1

- Winter wheat
- harvest July
- straw left in field



Year 1

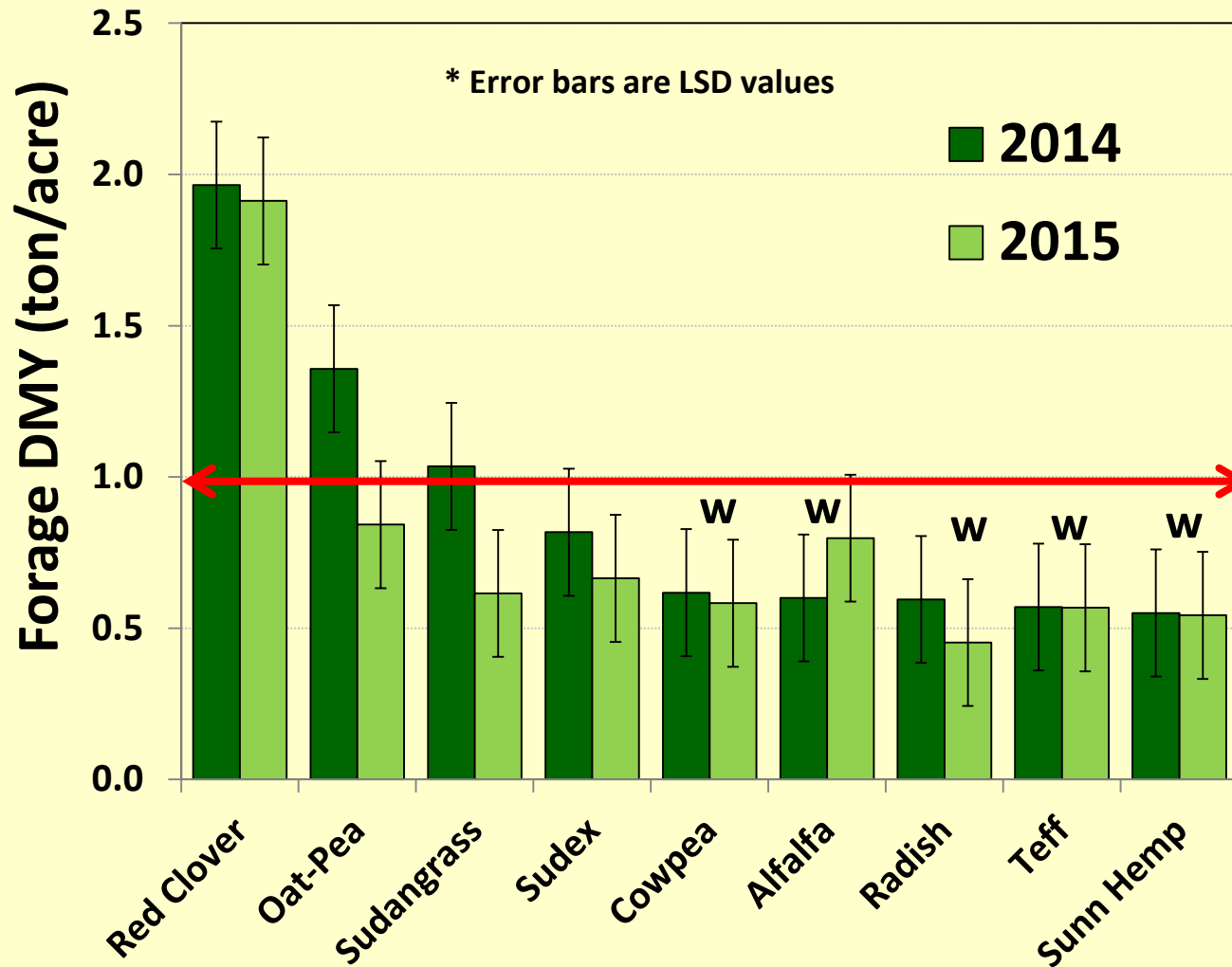
- Cover crop (plant July)
- Harvest half (60 DAP)
- Leave half as cover



Year 2

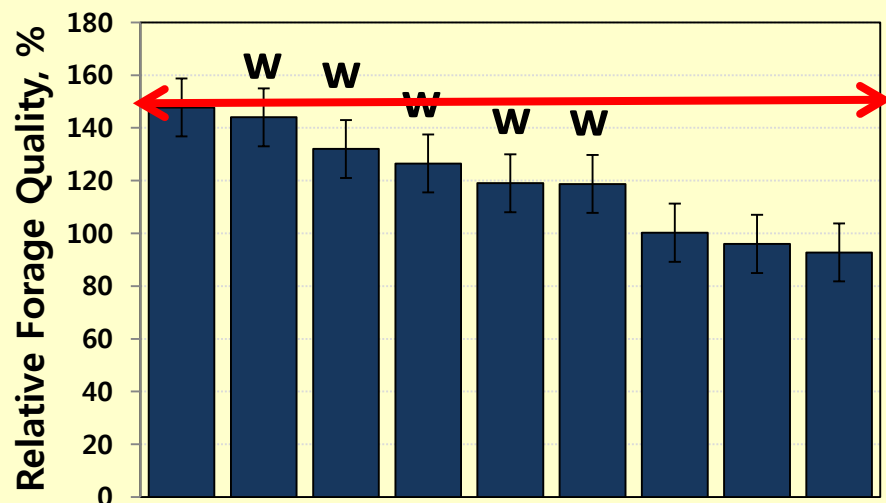
- Corn grain

Cover Crop Forage 60 D after planting



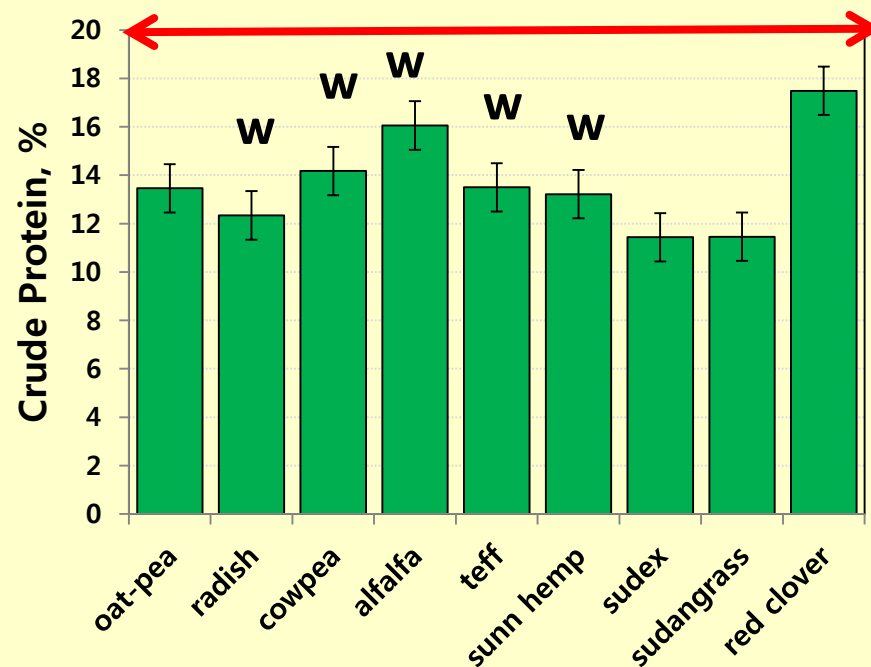
Cold, wet weather in July/Aug does not help grow warm-season covers

Fertilizer at cover planting would have boosted forage yield



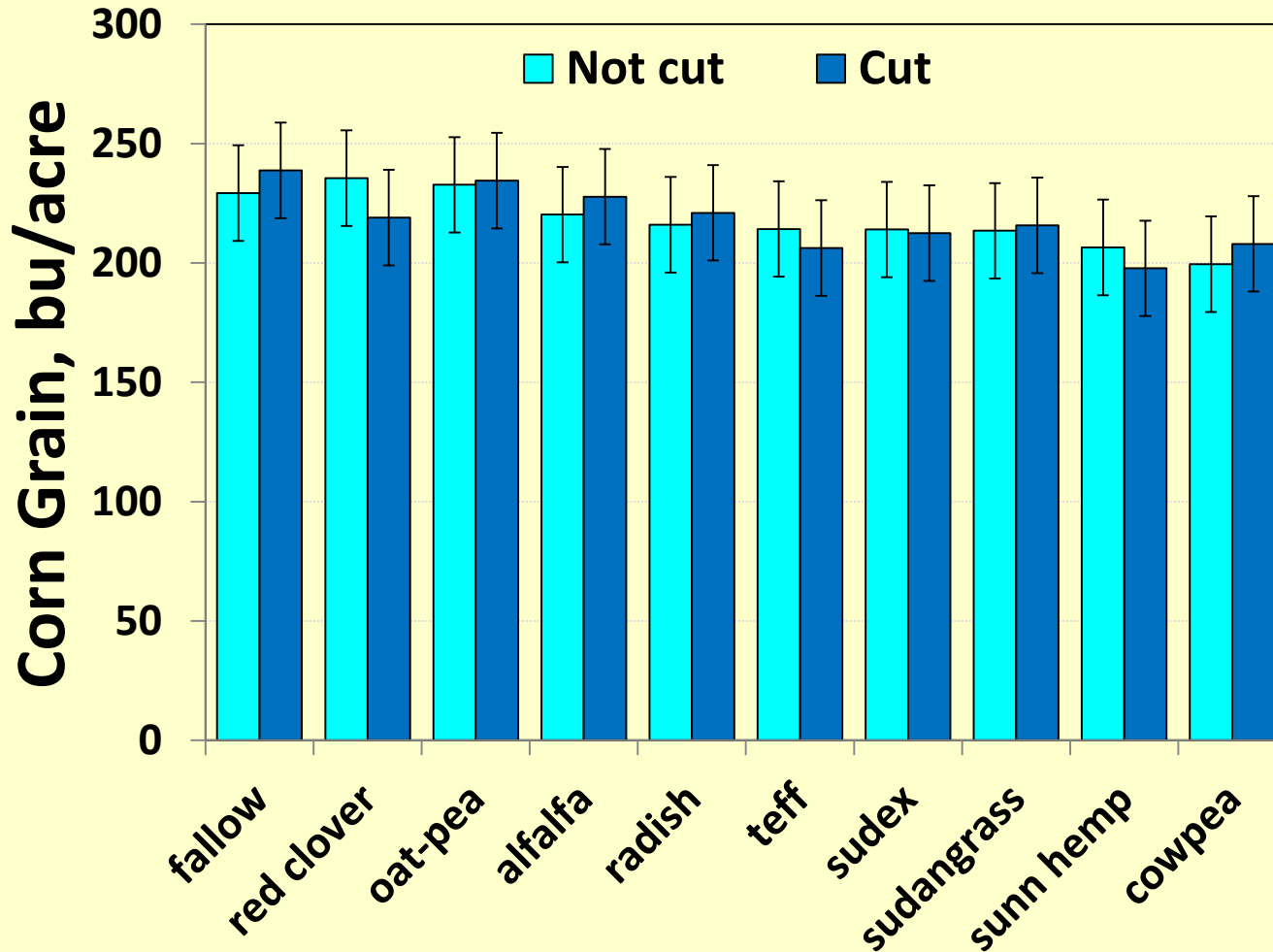
Cover Crops after Wheat - Forage Quality -

Forage quality acceptable
for many livestock classes



All cover crops except oat-pea, red clover, and sorghums also contained considerable amounts of volunteer wheat

Corn Yields Following Cover Harvest



**Removing
cover crop
biomass did
not reduce
corn yields**

* Error bars are LSD values. Fallow "cut" plots were cleared using glyphosate.

High energy cover crops for grass-finished Beef



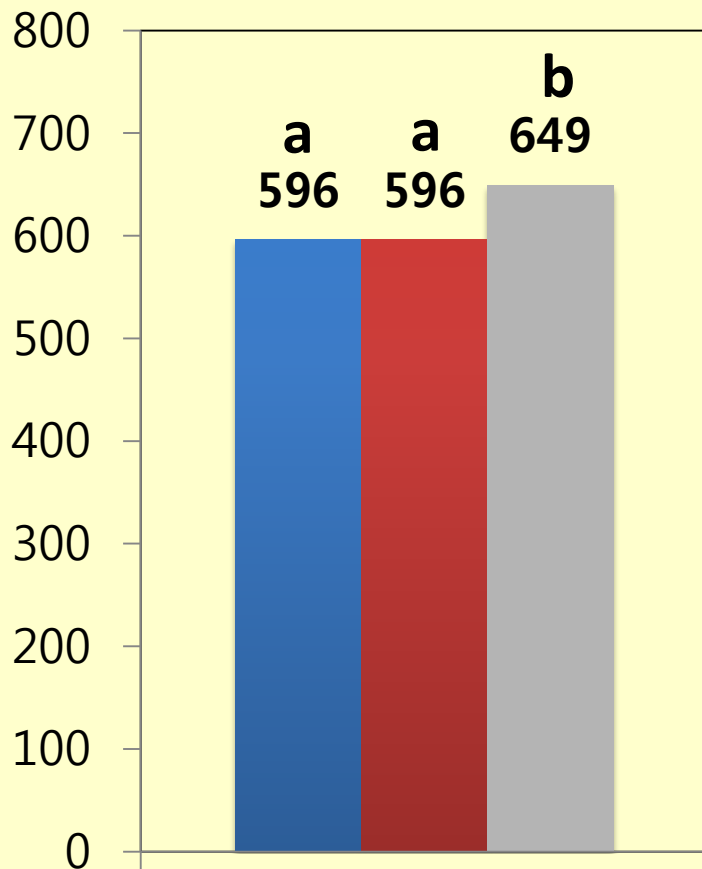
- Forage treatments
 1. grass-legume pasture (control)
 2. simple mix – oats, rape
 3. complex mix – oats, rape, turnip, peas, italian ryegrass
- Red Angus steers
 - Grazed for 8 wk in fall
 - Carcass data collected 48 hr post-mortem

Forage analysis

Table 2. Average forage analysis and yield data for three treatment diets.

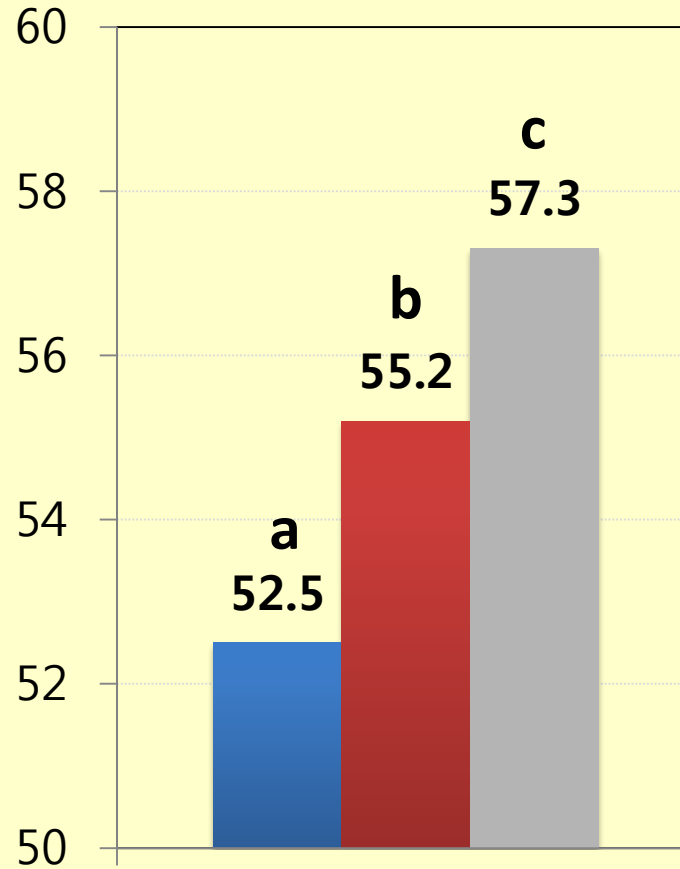
	MIX	SIMP	COMP
DM, %	31.3	18.2	15.1
NDF, %	60.4	40.0	32.9
ADF, %	37.0	27.0	24.7
Biomass, lb/acre	892	2450	2680
Forage utilization, %	64	74	75

Results



Hot Carcass Wt, kg

SEM = 12.4



Dressing Percent, %

SEM = 0.55

■ Mixed Pasture
■ Simple Mix
■ Complex Mix

Questions?

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Require too much fertilizer

**Biomass production of most annual forages is driven by fertility
Cover crops don't usually get fertilizer**

**Soil pH – >6.0 for brassicas and grasses
 >6.5 for legumes**

**Nitrogen – yield improves with 25-50 lb/acre of N at planting for
 brassicas and grasses**

Phosphorus & Potassium

- Soil Test!**
- Hopefully adequate on well-maintained row crop ground**
- On poor ground, follow soil test**

Boron – may be needed for brassicas on sandy or low OM soil

Cover Crops as Forages

Take Home Message

- 1) Frost-seeded red clover consistently yielded most but forage quality low**
- 2) Harvested oat-pea cover had highest forage quality, inconsistent yield**
- 3) Sudangrass cover had inconsistent yield and low quality**
- 4) RISK! Cold/wet weather in July/Aug is not favorable for harvest of warm-season covers**
- 5) Harvesting cover crops as forage did not affect corn grain yields**

Crop Insurance Issues

(RMA FAQ)

“Insurance shall attach to a crop following a cover crop when

- [1] the cover crop meets the definition provided in the Basic Provisions,*
- [2] was planted within the last 12 months,*
- [3] and is managed and terminated according to NRCS guidelines.*

If growing conditions warrant a deviation from the guidelines, producers should contact either Extension or the local NRCS for management guidance. For information on cover crop management and termination guidelines, refer to the Cover Crop Termination Guidelines published at
www.nrcs.usda.gov/wps/portal/nrcs/main/national/landuse/crops/.”

Essential Components of Forage Quality Relative to Cover Crops

- 1. Rule of thumb – “Dairy” quality alfalfa forage**
 - **Crude Protein ~20%**
 - **ADF ~30%**
 - **NDF ~40%**
 - **RFV ~140**
 - **RFQ ~150**
- 2. Match the quality to the needs of the animal**
- 3. Water content can be a challenge**
 - **Pasture vs. silage**

Small Grains: Oats, wheat, triticale, rye, barley

- Plant: April - October
- Seeding rate: 80 - 120 lb/acre
- 60 - 90 days to harvest
- Potential DMY: 1.5 to 3.5 ton DM/A over 1-2 cuts
- Quality: moderate – excellent
- Harvest at boot or soft dough



- Greater forage quality when grown in cool versus warm weather
 1. Cool weather delays maturity
 2. Cool weather increases WSC accumulation in oats (up to 24%)

Triticale after corn silage



Brassicas (incl. radish)

- Harvest: 60-90 days
- Plant: April - August
- Seeding rate: 3-4 lb/A
- Potential DMY: up to 10 ton DM/acre for rape/kale hybrids
- Forage quality: excellent
- Pasture: Excellent
- Haylage: too wet to ensile unless mixed with a higher DM forage to improve fermentation and reduce effluent
- Hay: Not feasible - High moisture, thick stems, waxy leaf coating, and leaf shattering





Cover Crops for Haylage after Wheat