

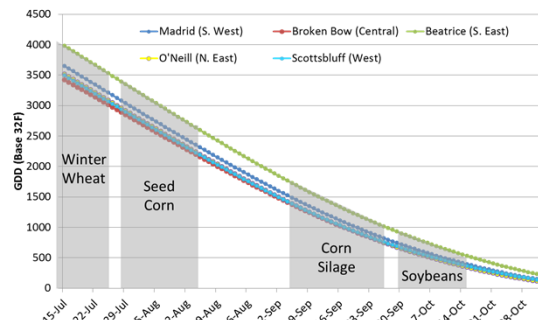
Using cover crops for fall forage



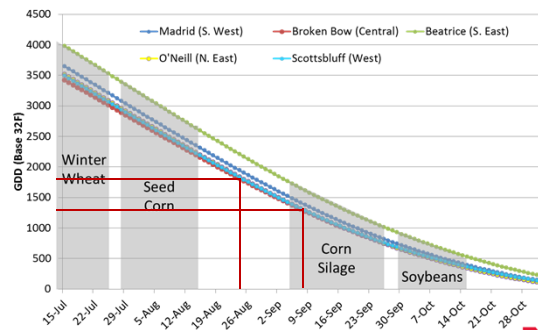
Mary Drewnoski, Beef Systems Specialist



Summer/Fall Growing degree days



Growing degree days



Species selection based on potential planting date

- Before August 10th
 - Warm-season
 - Sorghum Sudan, pearl millet
 - Oats, brassica
- After August 10th but before Sept 10th
 - Cool-season, winter-sensitive
 - Oats, brassicas
- After Sept 10th (spring forage)
 - Winter-hardy, cool-season
 - Rye, Triticale



Maximize your fall growth

Commit to planting quickly

Maximum yields will be obtained when soil conditions permit quick germination and emergence

The extra forage production can make hiring someone to plant profitable



Considerations for fall forage

Great option for backgrounding calves



Fall forage quality of summer planted oats

| | GDD | TDN, % DM | NDF, % DM | NDFD, % NDF | Lignin, % DM |
|------------------------|------|--------------|--------------|----------------|-----------------|
| Ogle Oat (early) | 1179 | 67.2 | 42.0 | 75.7 | 1.7 |
| | 2169 | 64.8 | 55.1 | 64.0 | 4.2 |
| Forage Plus Oat (late) | 1179 | 67.8 | 39.4 | 76.4 | 1.0 |
| | 2169 | 68.0 | 49.5 | 74.0 | 1.8 |

1179 = Sept 11-20

2169 = Aug 15-25

Crude Protein is dependent on amount of N applied
50lbs N usually ≥ 15% CP

Coblentz et al., 2010



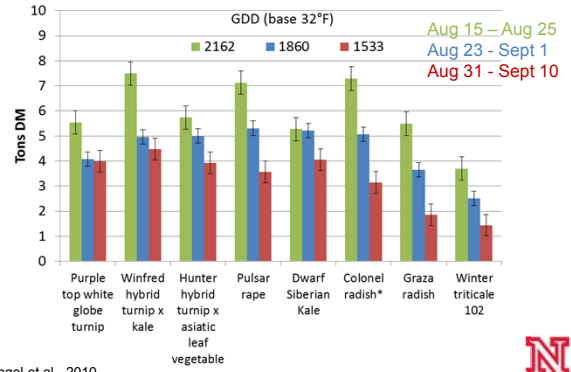
Nutrient content of brassicas

| | Purple top turnip ¹ | Kale | Rape | Alfalfa hay | Corn grain |
|--------------------|--------------------------------|------|------|-------------|------------|
| DM, % | 10.1 | 14.1 | 12.6 | 90.0 | 88.0 |
| | % DM basis | | | | |
| CP | 13.0 | 16.7 | 19.3 | 19.9 | 8.0 |
| S | 0.69 | 0.85 | 0.61 | 0.30 | 0.12 |
| NDF | 24.0 | 20.1 | 23.4 | 39.3 | 10.8 |
| ADF | 18.0 | 12.9 | 16.3 | 31.9 | 3.3 |
| Sugar/starch (NSC) | 23.8 | 17.3 | 19.6 | 11.3 | 73.0 |

Brassica nutrient content from Sun et al., 2012
¹Turnip leaf to bulb ratio 1:1



Fall yield of brassicas



Engel et al., 2010



Wheat fields



Nutritive value of brassicas and oats planted after wheat

| | Radish | | Turnip | | Oat |
|---------------------|---------------|------|--------|------|------|
| | Leaves | Root | Leaves | Root | |
| DM, % | 5.9 | 6.0 | 8.4 | 8.5 | 15.0 |
| | % on DM basis | | | | |
| Crude Protein | 18.2 | 8.2 | 13.5 | 8.4 | 9.6 |
| TDN | 81.2 | 90.0 | 82.9 | 85.1 | 58.6 |
| NDF (Fiber) | 21.7 | 14.9 | 19.9 | 16.5 | 60.9 |
| Sugar | 12.7 | 22.8 | 17.2 | 22.7 | 9.6 |
| Sulfur | 0.69 | 0.61 | 0.57 | 0.53 | 0.20 |
| Proportion of plant | 60.5 | 39.6 | 63.6 | 36.4 | - |

Planted in early August in southeast Nebraska and harvested in late October
 Forage yield 2.27 tons DM/ac with 39, 35 and 26% of DM being radish, turnip and oat, respectively.

Planted after wheat harvest at a rate of 2 lb of radish, 3 lb of turnip and 40 lb of oat seed per acre. Fertilized with 50 lb of N/ac.

Corn silage fields



Nutritive value of brassicas and oats planted after corn silage and change over winter

| % of DM | Radish top | | Turnip top | | Oats | |
|---------------|------------|----------|------------|----------|----------|----------|
| | November | December | November | December | November | December |
| Crude Protein | 28 | 27 | 29 | 27 | 19 | 21 |
| ADF | 16.0 | 20.2 | 13.1 | 19.0 | 24.0 | 32.2 |
| WSC (sugar) | 10.7 | 6.2 | 13.3 | 7.6 | 18.2 | 8.3 |
| NDF (fiber) | 20.4 | 34.7 | 17.9 | 33.0 | 37.8 | 49.5 |
| Sulfur | 0.75 | 0.81 | 0.67 | 0.76 | 0.26 | 0.29 |



Minimal change in nutrient content



Nov 6th

Dec 9th



Seed corn fields



Oat-brassica mix after corn silage

- Oats (84 lb/ac), Radish (2.0lb/ac), Turnip (1.5 lb/ac)
- Sept 8th in Clay Center, NE
– Irrigated Field
- Fertilized with 48 lbs N/ac via pivot
- 1.7 tons DM/ac

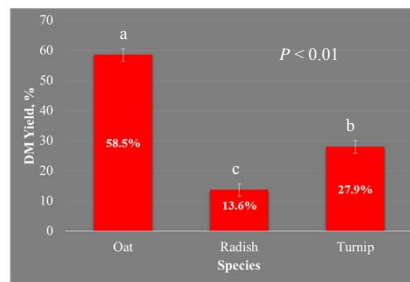


Cox et al., 2016 Beef Report, p 55



Forage yield and seed cost

| | Oats | Radish | Turnip | Total |
|---------------------|-------|--------|--------|-------|
| Seed cost \$/ac | 25.20 | 5.00 | 2.70 | 32.90 |
| Seed cost \$/ton DM | 25.33 | 21.62 | 5.69 | 18.82 |



Fall grazing of an oat-brassica mix after corn silage

- Stocked at 0.9 hd/ac of 600 lb calves
– 1 calf/1.5 tons DM
– Started grazing Nov. 20th
- Grazed for 64 days
– 1286 lbs DM/ac remaining
- Steers gained 2.2 lbs/d (141 lbs/ac)



Backgrounding economics oats/brassiccas after corn silage

| Item | Cost | With yardage |
|---------------------|--------------|--------------|
| 48 lbs N/ac | 27.36 | |
| Seed cost | 32.90 | |
| Seeding | 12.00 | |
| Fertilizer app | 6.00 | |
| Total, \$/ac | 78.27 | |
| Calves/ac | 0.93 | |
| Mineral, \$/calf | 4.53 | |
| Total Cost \$/calf | 88.91 | 98.50 |
| Cost \$/lb of gain | 0.63 | 0.70 |



Yardage \$0.15/d



Backgrounding economics Residue plus DDGS

- Supplemented 6 days a week
 - 6.1 lbs DM/d of DDGS + 2% limestone
 - Gained 1.77 lb/d



| Item | Cost | With yardage |
|------------------------|-------|--------------|
| Distillers (\$129/ton) | 22.97 | |
| Residue (\$0.20/d) | 12.8 | |
| Mineral (\$0.07/d) | 4.53 | |
| Cost \$/calf | 40.30 | 56.30 |
| Cost \$/lb of gain | 0.36 | 0.50 |

Yardage \$0.25/d



Fall grazing of a mix after wheat 2013 Mead, NE

- Baled Wheat Straw
- Sprayed out volunteer wheat
- No fertilizer applied
- Planted on Aug. 17th 2013

| Forage Type | 2013 Seeding Rate (% of full seeding rate) |
|-------------------|---|
| Oats | 15 lbs./acre (13%) |
| Sorghum | 1 lbs./acre (3%) |
| Crimson clover | 1 lbs./acre (10%) |
| Purple Top Turnip | 2 lbs./acre (40%) |
| Sunflower | 2 lbs./acre (22%) |
| Total | 21 lbs./acre (88%) |

Ulmer et al., 2016 Beef Report



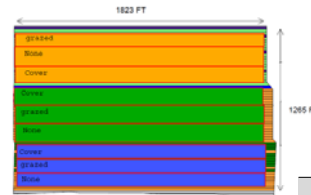
Fall grazing of a mix after wheat 2013 Mead, NE

| Forage DM Ton/ac | Stocking rate (hd/ac) | days | ADG (lb/d) | Gain per ac (lb) |
|------------------|-----------------------|------|------------|------------------|
| 1.01 | 1.0 | 48 | 2.0 | 97 |

| Expenses | Cost |
|------------------------|--------------|
| Seed cost, \$/ac | 11.00 |
| Seeding, \$/ac | 12.00 |
| Total, \$/ac | 23.00 |
| Calves/ac | 1.0 |
| Cost \$/calf | 23.00 |
| Yardage (\$0.15 hd/d) | 7.20 |
| Cost \$/calf | 30.20 |
| Cost lb of gain | 0.31 |



Subsequent Soybean yield (2014)



Three Replicates
(5 ac per experimental unit)

NO EFFECT ON
SOYBEAN YIELD

| Treatment | Soybean Yield (bu/ac) |
|----------------------|-----------------------|
| No cover crop | 64.4 |
| Cover crop, ungrazed | 63.7 |
| Cover crop, grazed | 62.2 |
| P-value | 0.47 |

Fall grazing of a mix after wheat 2014 Mead, NE

- Baled Straw
- 210 lb N/ac from liquid feedlot manure
- Planted on Aug. 15th
- Dryland Field

| Forage Type | 2014 Seeding Rate (% of full seeding rate) |
|-------------------|---|
| Oats | 15 lbs./acre (13%) |
| Sorghum | 5 lbs./acre (17%) |
| Daikon Radish | 3 lbs./acre (30%) |
| Purple Top Turnip | 3 lbs./acre (60%) |
| Safflower | 4 lbs./acre (44%) |
| Total | 27 lbs./acre (161%) |



Fall grazing of a mix after wheat 2014 Mead, NE

| | Oats | Sorghum | Radish | Turnip | Safflower | Total |
|---------------------|---------|---------|--------|---------|-----------|---------|
| Seeding rate lbs/ac | 15 | 5 | 3 | 3 | 4 | 27 |
| Seed cost \$/ac | \$4.50 | \$5.25 | \$7.50 | \$5.40 | \$3.20 | \$25.85 |
| Pounds DM/ac | 674 | 379 | 1708 | 845 | 0 | 3605 |
| Yield, % of DM | 18.7 | 10.5 | 47.4 | 23.4 | 0.0 | 100 |
| Seed cost/ton DM | \$13.35 | \$27.73 | \$8.78 | \$12.78 | -- | \$14.36 |



Fall grazing of mix after wheat Mead, 2014

| Forage DM Ton/ac | Stocking rate (hd/ac) | days | ADG (lb/d) | Gain per ac (lb) |
|------------------|-----------------------|------|------------|------------------|
| 2.39 | 1.70 | 52 | 1.55 | 137 |

| Expenses | Cost | Cost |
|------------------------|---------------|--------------|
| Manure, \$/ac | 70.00 | --- |
| Seed cost, \$/ac | 25.85 | 25.85 |
| Seeding, \$/ac | 12.00 | 12.00 |
| Total, \$/ac | 107.85 | 37.85 |
| Calves/ac | 1.7 | 1.7 |
| Cost \$/calf | 63.44 | 22.26 |
| Yardage (\$0.15 hd/d) | 7.80 | 7.80 |
| Cost \$/calf | 71.24 | 30.06 |
| Cost lb of gain | 0.52 | 0.22 |



Subsequent corn yield (2015)

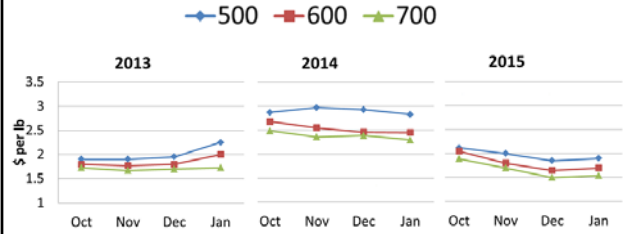
| | Control | Cover crop | Grazed cover crop | SEM | P-value |
|--------------|---------|------------|-------------------|-----|---------|
| Yield, bu/ac | 236 a | 210 b | 227 a | 6.2 | 0.03 |

Means lacking common letters differ ($P \leq 0.05$)

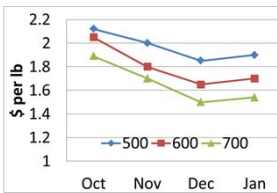
***No additional fertilizer was added after manure



Recent calf prices in fall/winter



What about 2015?



2014 Corn silage (no N)

Cost \$59.60/calf
 Start 600 lb @ \$1.80 (\$1080)
 End 741 lb @ \$1.54 (\$1141)
 \$61 increase in value of calf
\$1/calf or \$1/ac

2013 Wheat

Cost \$43.20/calf
 Start 450 lb @ \$2.00 (\$900)
 End 544 lb @ \$1.90 (\$1034)
 \$134 increase in value of calf
\$91/calf or \$91/ac

2014 Wheat (no N)

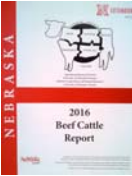
Cost \$30.06/calf
 Start 585 lb @ \$1.80 (\$1053)
 End 665 lb @ \$1.70 (\$1130)
 \$77 increase in value of calf
\$47/calf or \$80/ac

Fall grazing of cool-season cover crops with calves


| Cover crop planted (following cash crop) | Yield, ton DM/ac | Stocking rate calf/ac | Days of grazing | ADG, lbs/hd | Gain, lb/ac |
|--|------------------|-----------------------|-----------------|-------------|-------------|
| 5 species mix (wheat) | 1.1 | 1.0 | 48 | 2.0 | 97 |
| 5 species mix (wheat) | 1.8 | 1.7 | 53 | 1.6 | 137 |
| Oats, turnip, radish (corn silage) | 1.7 | 0.9 | 64 | 2.2 | 141 |
| Oats, turnip, radish (corn silage) | 2.1 | 1.0 | 66 | 1.3 | 86 |
| Oats (corn silage) | 1.4 | 1.7 | 62 | 1.3 | 133 |




More Information



2016
Beef Cattle
Report



NebGuide
Annual Cool-Season Forages for
Late-Fall or Early-Spring Double-Crop



UNL BeefWatch
March 2016

Beef Forage Crops Systems

Double-cropped cool season annuals lower costs for late fall and early spring forage

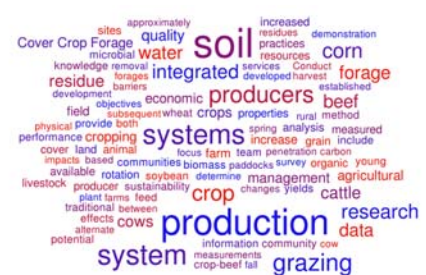
Previous Articles

- Annual and Double-Cropped Forages Lower Costs
- Annual Forage Research Plan Available Online
- Cover Crop Forages: The Worst Offense?
- Spring Forage Harvest in the Middle of the Season
- Weather-Resistant Forages for the Growing Season: Research Update
- Crop Rotation
- Cover Crop Options for Growing Cattle from Birth to Weaning with Double-Crop Supplemental Nutrition
- Using Double-Cropped Forage to Feed Cattle
- Fall Forage Harvest and Storage: An Agreements
- Double-Crop Forage: A Research Update

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Beef.unl.edu

Questions?



Approximately 100 words are included in the word cloud, with the most prominent terms being:

- soil
- water
- integrated
- systems
- production
- crop
- research
- data
- grazing
- beef
- corn
- producers
- forage
- cover crop
- residue
- management
- agricultural
- livestock
- producer
- sustainability
- information
- community
- cow
- measurements
- crop-beef
- fall
- system
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