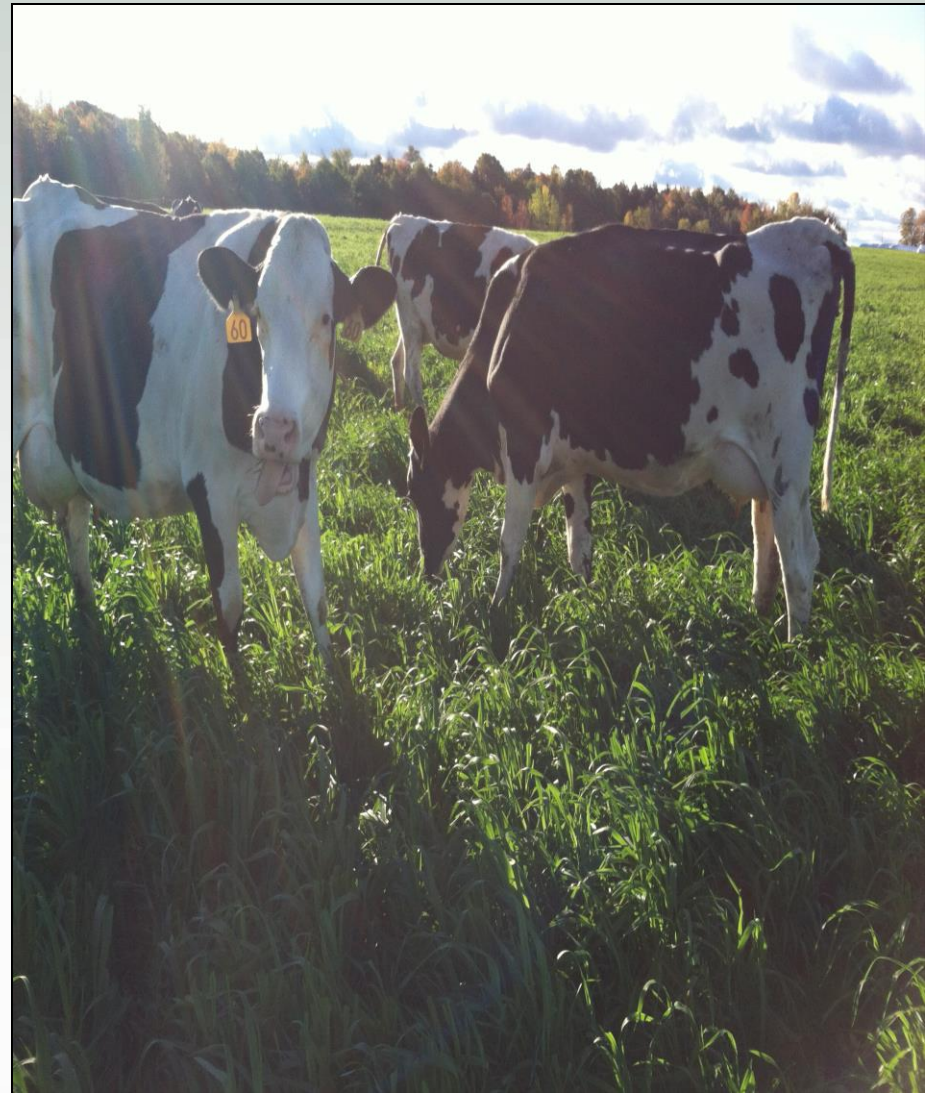


Utilizing Annual Forage in the Northeast

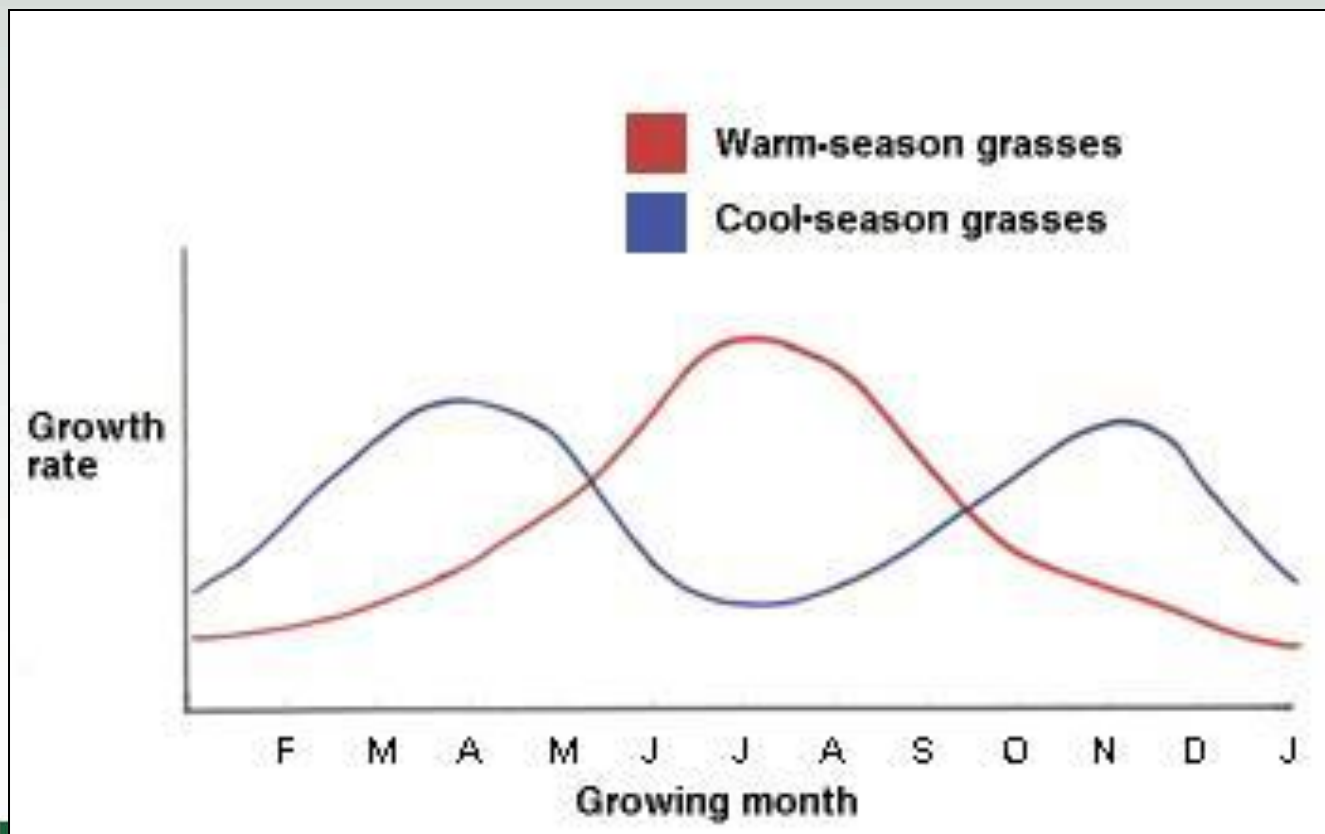


Why Consider Annuals

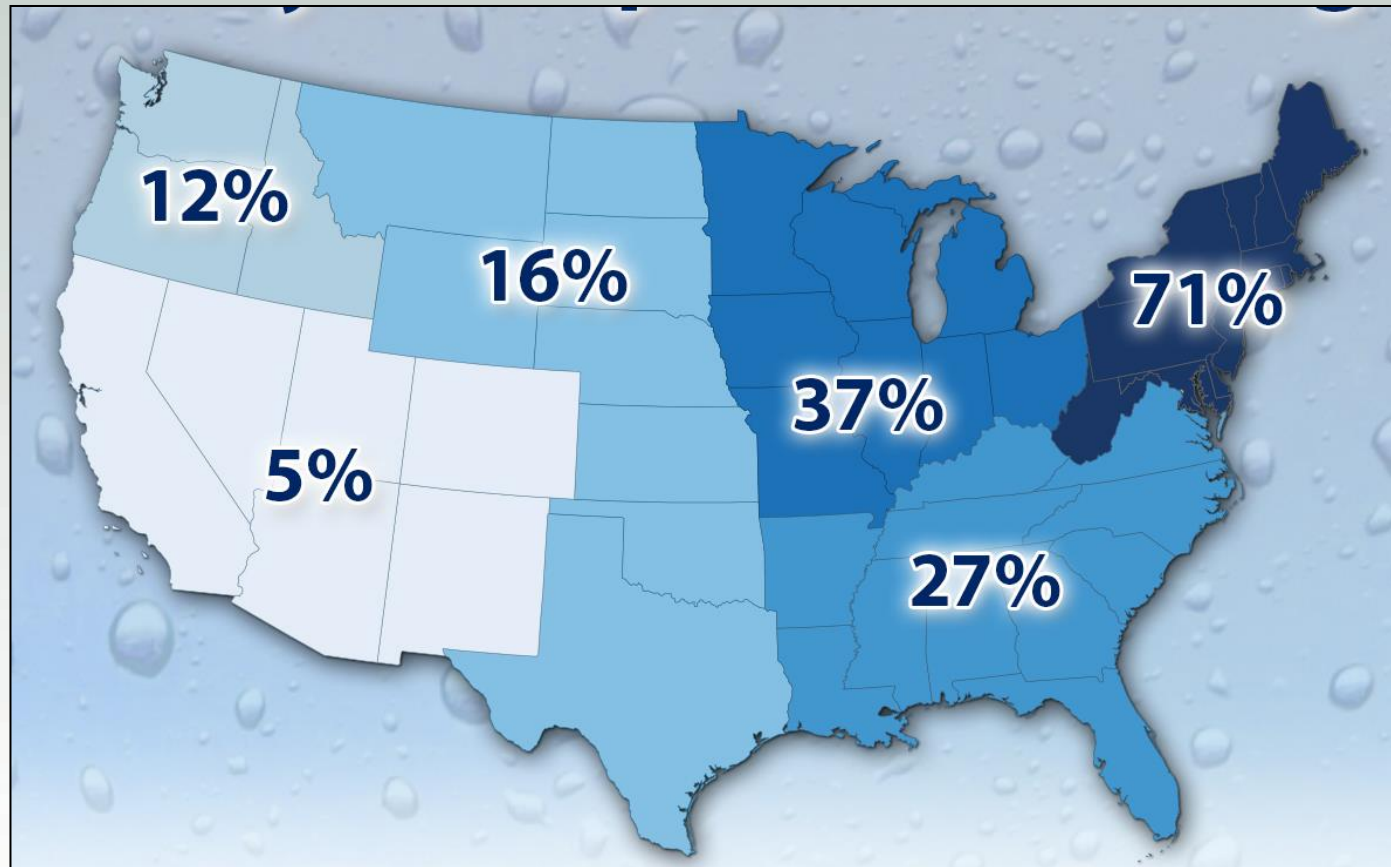
- Drought tolerant
- Cold tolerant
- Fill gaps in feed (summer slump)
- High biomass crop
- Multipurpose
 - Grazing
 - Silage/balage
 - Grain/seed



“Summer Slump” of Perennial Pasture



Trends in Extreme Precipitation

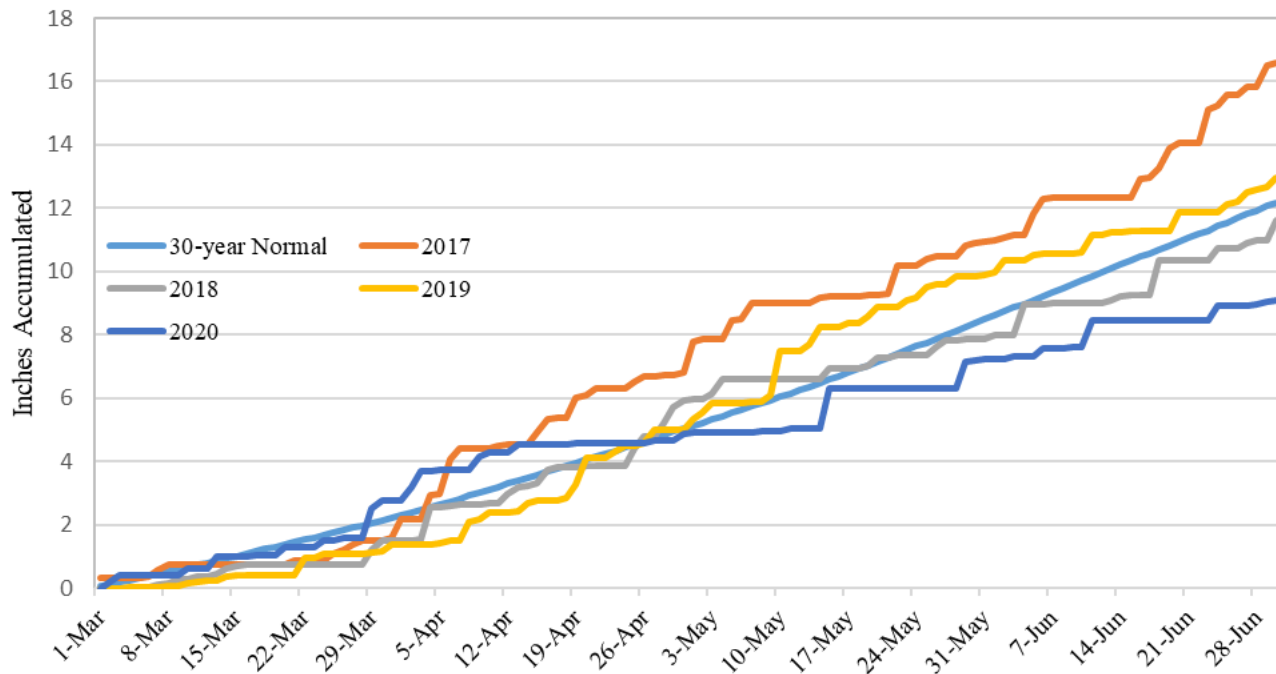


Increase in the number of 2" rainfalls per year from 1958 to 2011



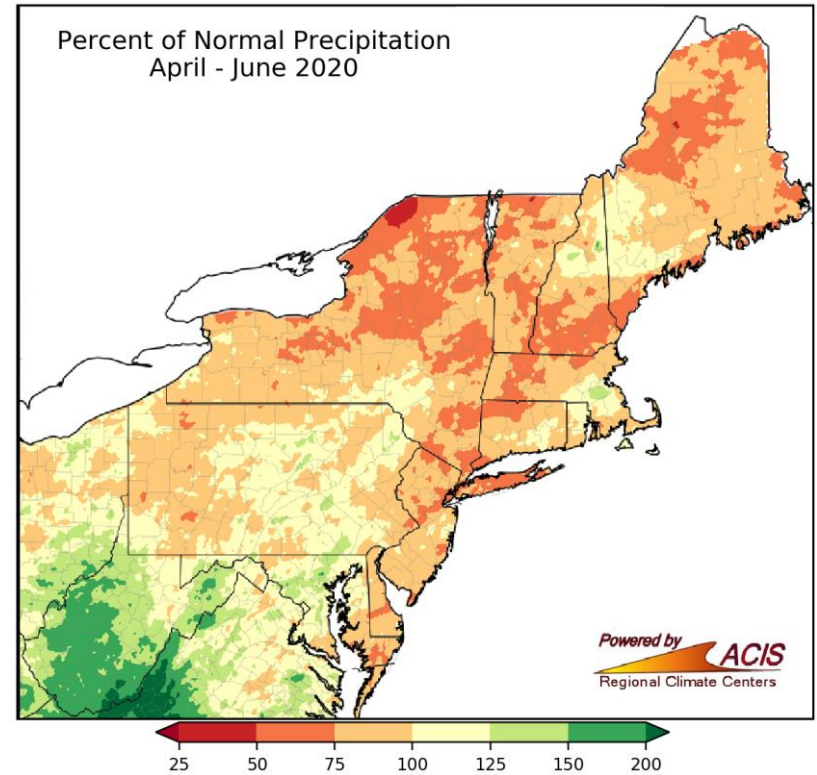
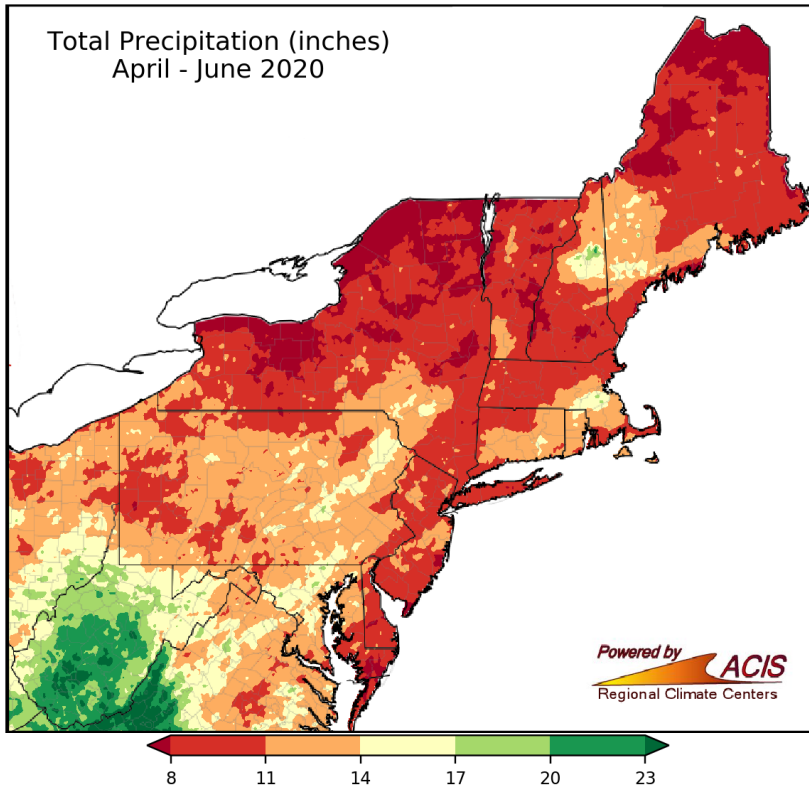
Precipitation March-June, Alburgh VT, 2017-2020

Accumulated Precipitation March-June 2020

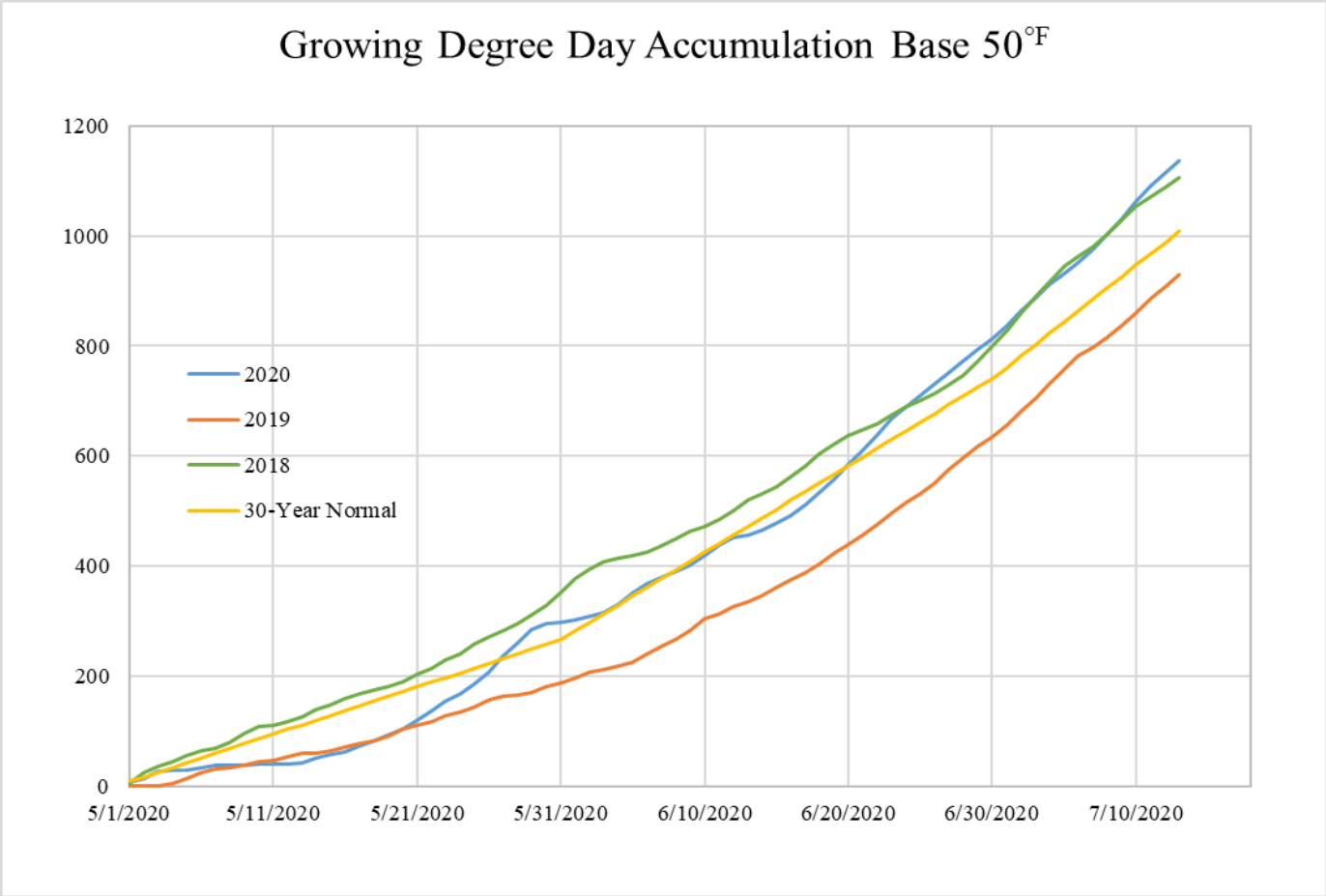


| Month | Accumulated Precipitation | Departure from Normal |
|-------|---------------------------|-----------------------|
| March | 2.79 | 0.57 |
| April | 4.88 | -0.16 |
| May | 7.23 | -1.26 |
| June | 9.09 | -3.09 |

Regional Precipitation and Percent Normal Precipitation April-June, via ACIS by NOAA Regional Climate Centers

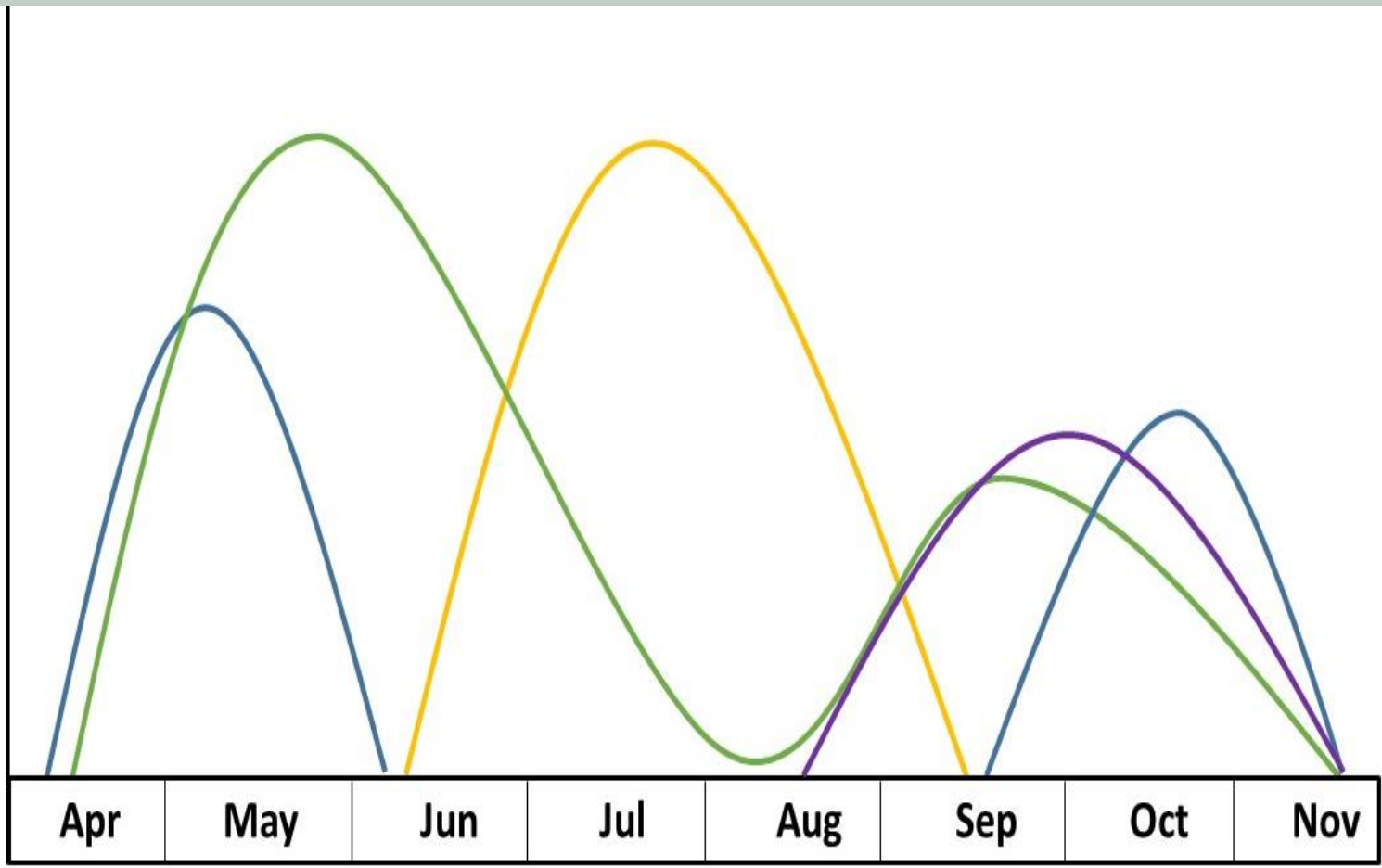


Growing Degree Day Accumulation 1-May to 13-July, Alburgh VT, 2018-2020



| Year | GDDs from 1-May to 13-Jul |
|----------------|---------------------------|
| 2018 | 1107 |
| 2019 | 931 |
| 2020 | 1137 |
| 30-Year Normal | 1008 |





— Perennial Pasture
 — Cereal Grains
 — Summer Annuals
 — Brassicas

Cool Season Annuals

- Small Grains
 - Spring or Winter
 - Forage types preferred in most cases
 - Can use mixtures
- Annual ryegrass
- Brassica forage crops
 - Kale, turnips, radish, etc.
- Legumes (seed earlier if possible)
 - Peas, Crimson clover, red clover, other options

Cool season – winter small grains

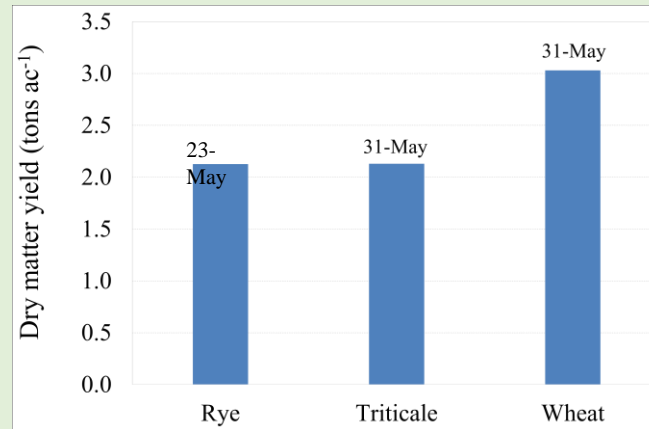
- Winter wheat, winter rye, winter triticale, winter barley and oats
- Often used as cover crops after other crops, such as corn silage, are harvested
- If wheat, rye, or triticale are planted early enough they can be harvested or grazed in the fall **and** the following spring
- Plant by mid-September. After that you will not have much tillering, significantly reducing your yields and requiring higher seeding rates



Figure 1. Rye at fall harvest in late October. From left to right: planted 30-Sep, 15-Sep, and 2-Sep.

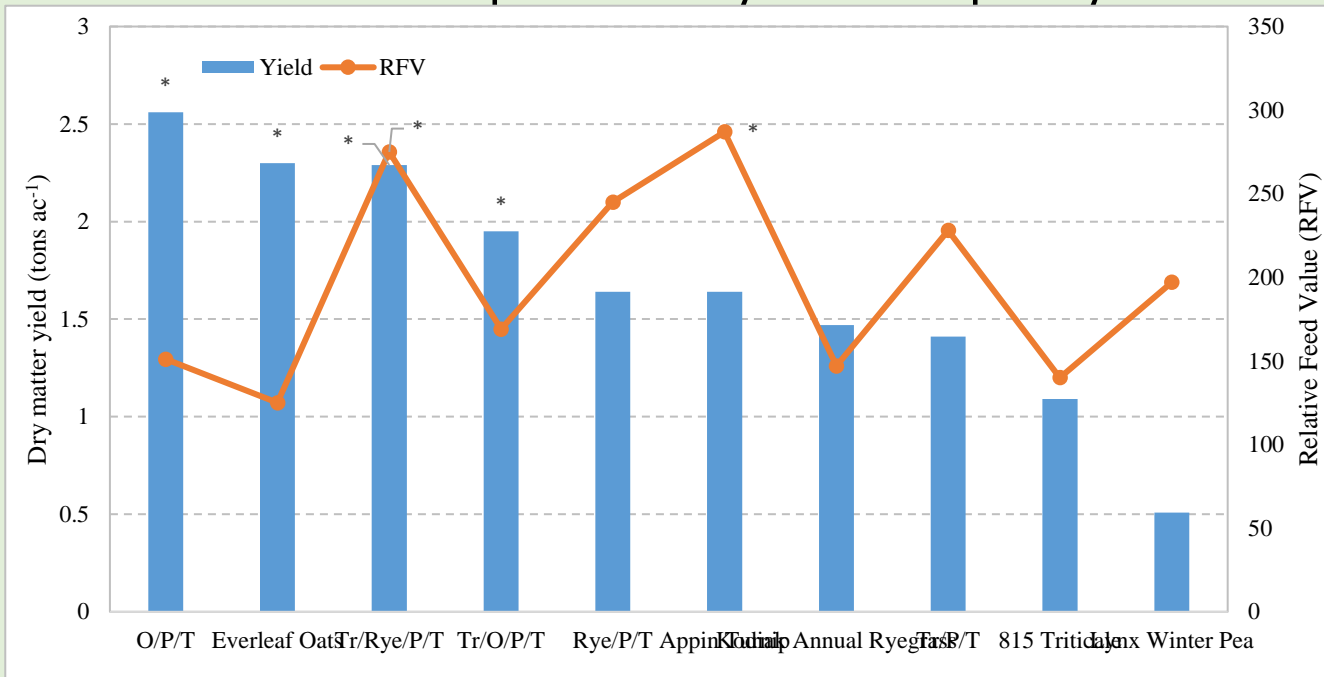
Winter grain varietal selection

- Oats winterkill in VT and therefore will not provide fall and spring forage like the other grains
- Winter rye is the most winter hardy and commonly available
- Winter barley does not survive well without adequate snow cover
- In the spring, rye can mature 7-14 days earlier than wheat and triticale



Cool season – other species and mixtures

- Annual ryegrass and forage peas
- Mixtures can help increase yield and quality



ESTABLISHMENT

Grain drill works well but can broadcast and incorporate with tool.

Plant in August for September, October, and November grazing.

Delayed planting often poor soil moisture this time of year.

ESTABLISHMENT

Planting depth depends on species and/or mixture.

Most species fine with ½ to 1 inch depth of planting.

Seeding rate depends on species.

Small grains 100 to 150 lbs/acre

Brassica species 5 to 10 lbs/acre

Annual ryegrass 15 to 20 lbs/acre

Legumes 15 to 20 lbs/acre

FERTILITY

Relatively low nitrogen requirements depending on species
– 50 to 100 lbs of N

Prior crop will determine at least N needs.

Manure application before plant likely adequate.

The P & K requirements determined from soil test but overall similar to other grass species.

pH 6.0 to 7.0

Pasture Comparison -

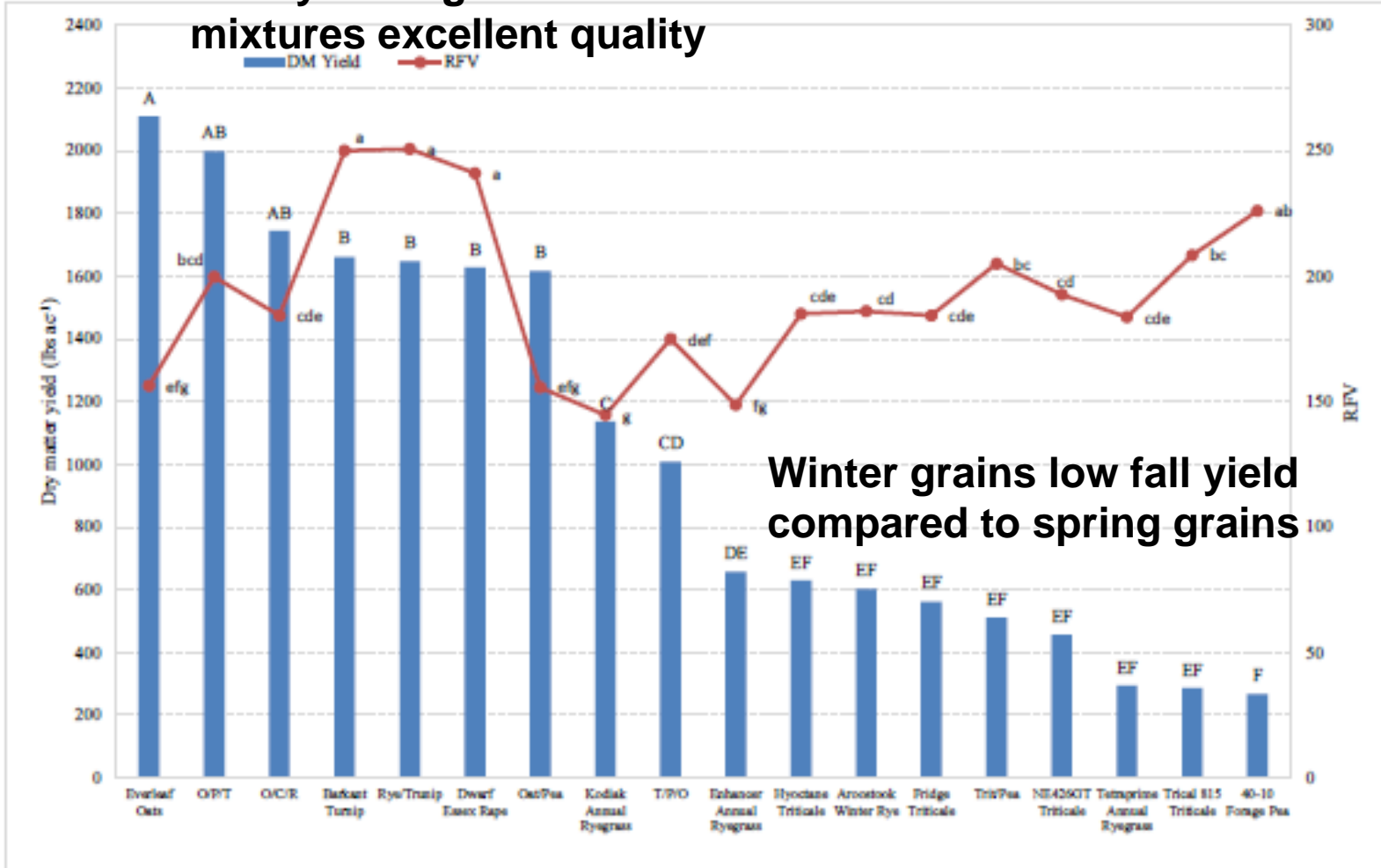
Perennial Pasture

- CP = 16.4%
- NDF = 53%
- dNDF = 59.7%
- NEL = 0.64 Mcal
- TDN = 61.6%

Oats & Peas

- CP = 38%
- NDF = 35%
- dNDF = 70.3%
- NEL = 0.74 Mcal
- TDN = 68.7%

Oats yield highest & in mixtures excellent quality



Winter grains low fall yield compared to spring grains

Figure 1. Dry matter yield and RFV of 18 annual forage mixtures/species, 2018. Treatments that share a letter performed statistically similarly to one another.

Annual ryegrass very different by variety

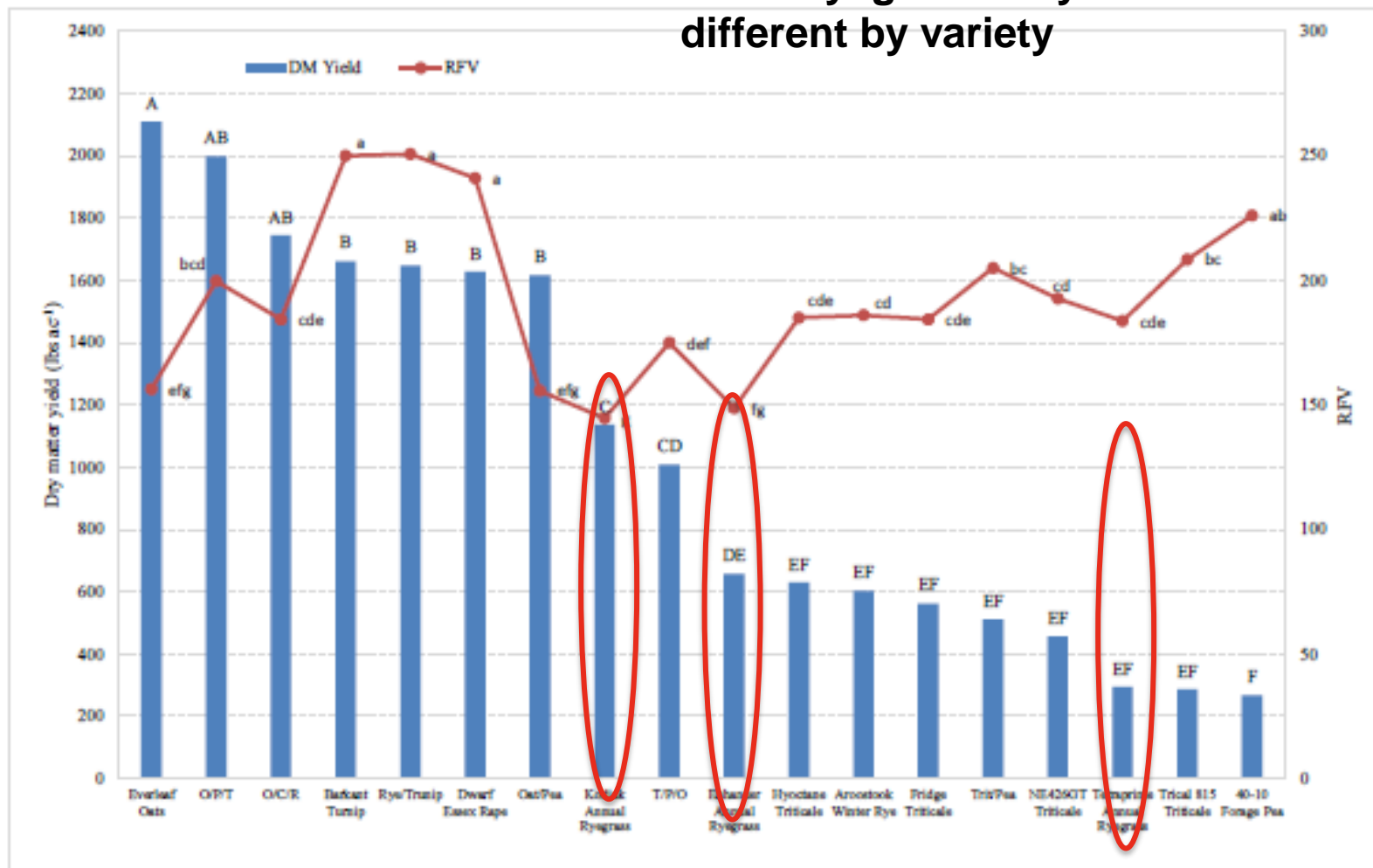
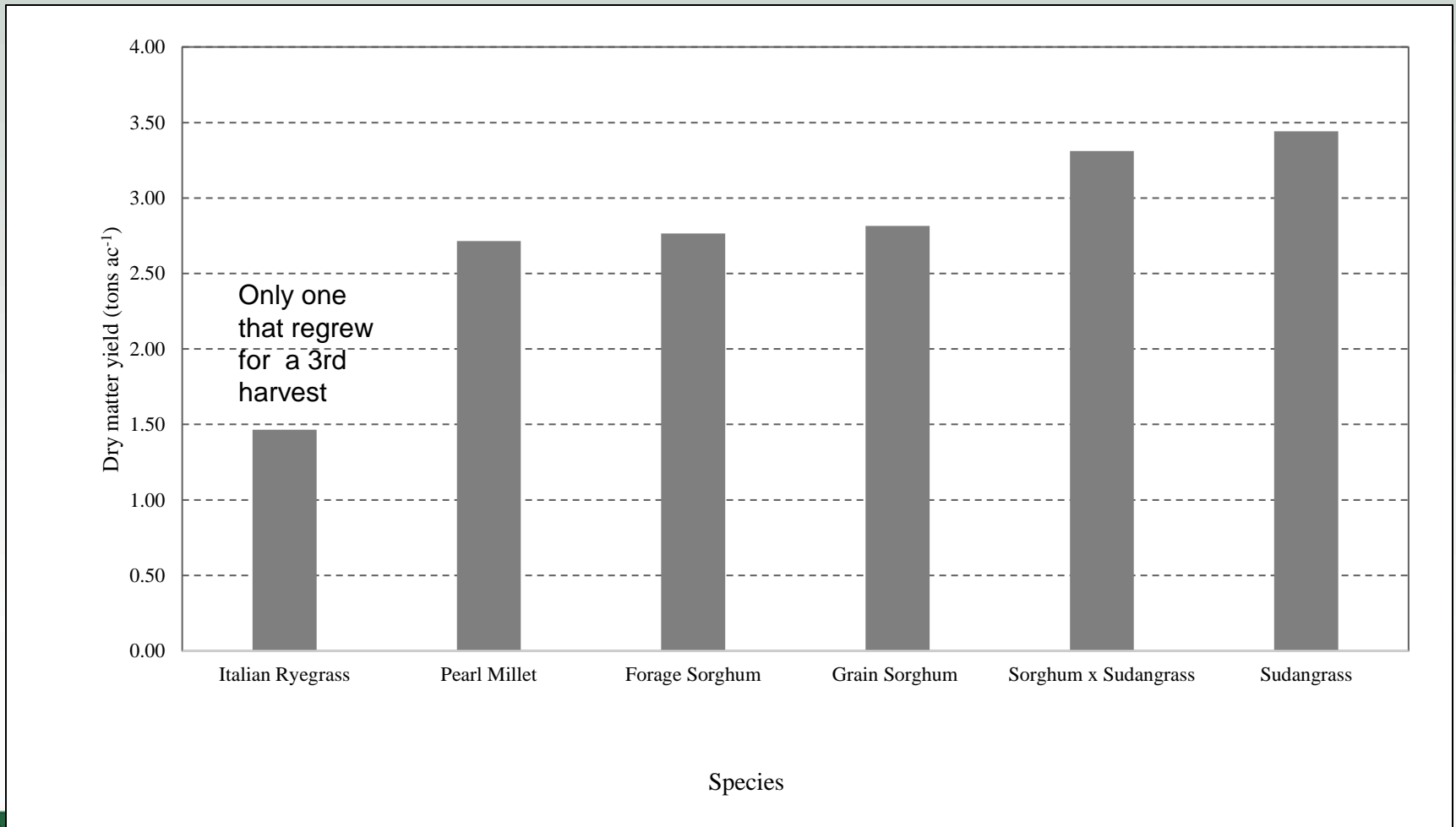


Figure 1. Dry matter yield and RFV of 18 annual forage mixtures/species, 2018.

Treatments that share a letter performed statistically similarly to one another.

Spring & Fall Annuals

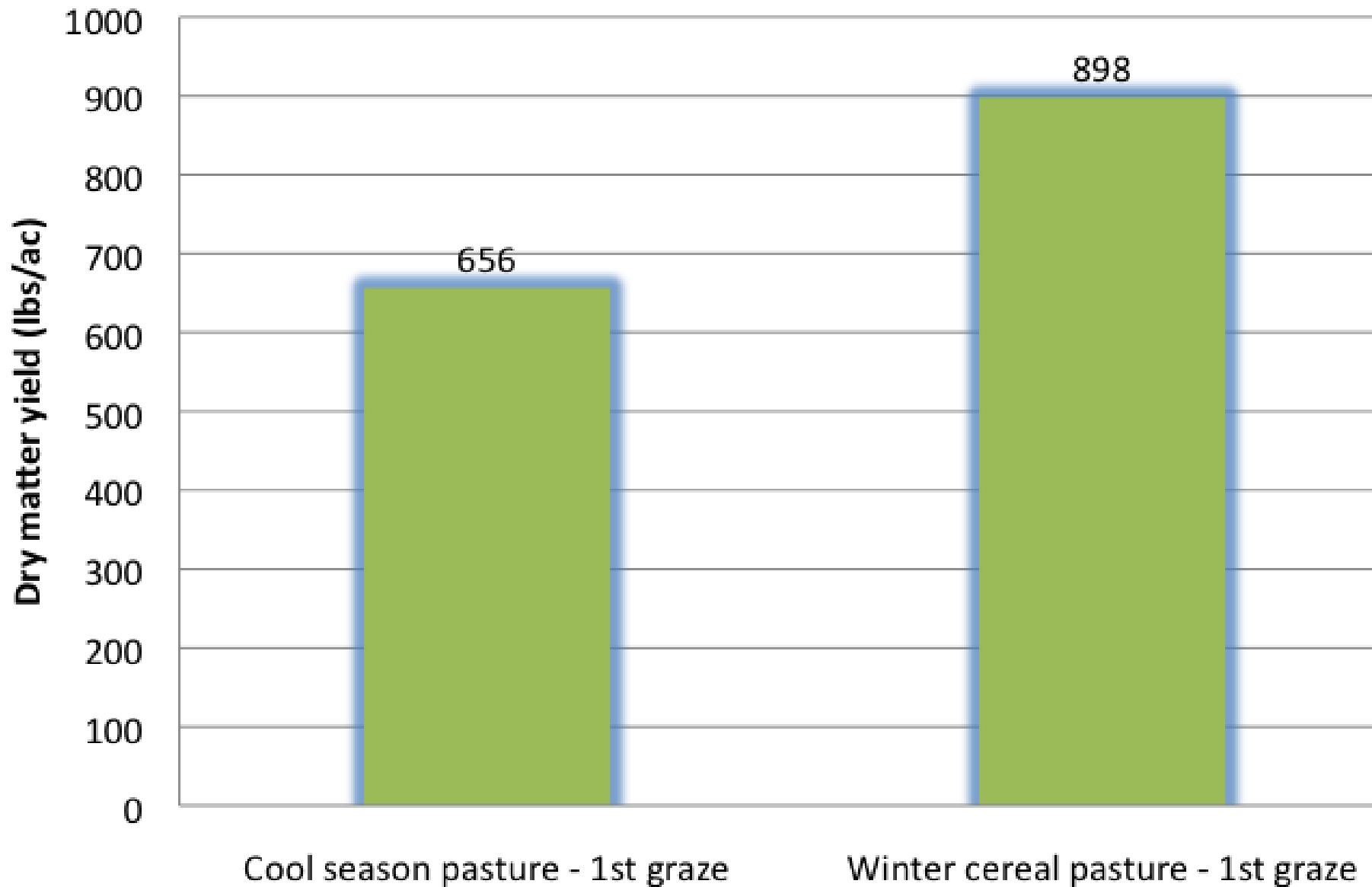


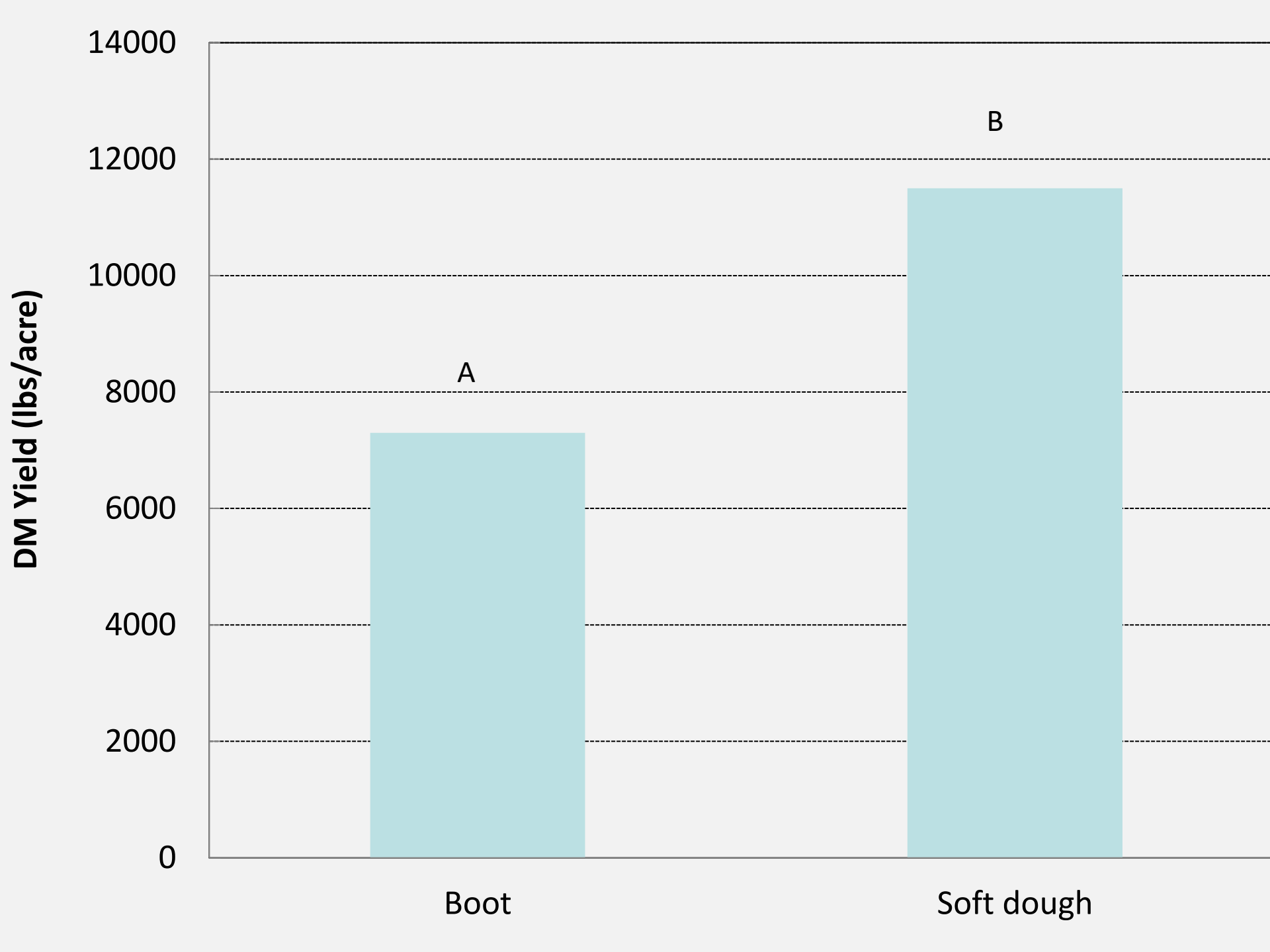
Grazed Triticale

| Triticale | DM | DM Yield | Forage Quality Characteristics | | | |
|---------------|-------------|-------------|--------------------------------|-------------|-------------|-------------|
| | | | CP | NDF | dNDF | NEL |
| | % | lbs/acre | % | % | % | Mcal |
| Grazed | 21.8 | 1350 | 19.4 | 48.5 | 70.6 | 0.71 |



Pasture vs. Cereals





Cool season – brassicas

- Turnips, kale, radishes, mustard, rape, and hybrids
 - Extend the grazing season – can withstand light frosts
 - Opportunity for a broadleaf to enter a grass-dominant rotation
 - Some form bulbous roots which may also provide additional feed to grazing animals
 - 1000-3000 lbs DM per acre into late October or November
 - Seeded at very low seeding rates ~ 6 lbs per acre into well prepared seedbed mid-August or early September
- Cautions:
 - Very digestible and pose bloat risk
 - Can cause off-flavors in milk – limit to <30% of forage intake
 - Very high moisture content – better suited to grazing
 - Can cause issues if used as full diet – not advised

Fall Seeded Brassica

Seeded in mid- August

5 - 10 lbs per acre seeding rate

Mid-September 10 inches in height

Harvested in mid-October

Potential for multiple harvest times

At harvest 2 to 3 feet in height



T-raptor

Pasja

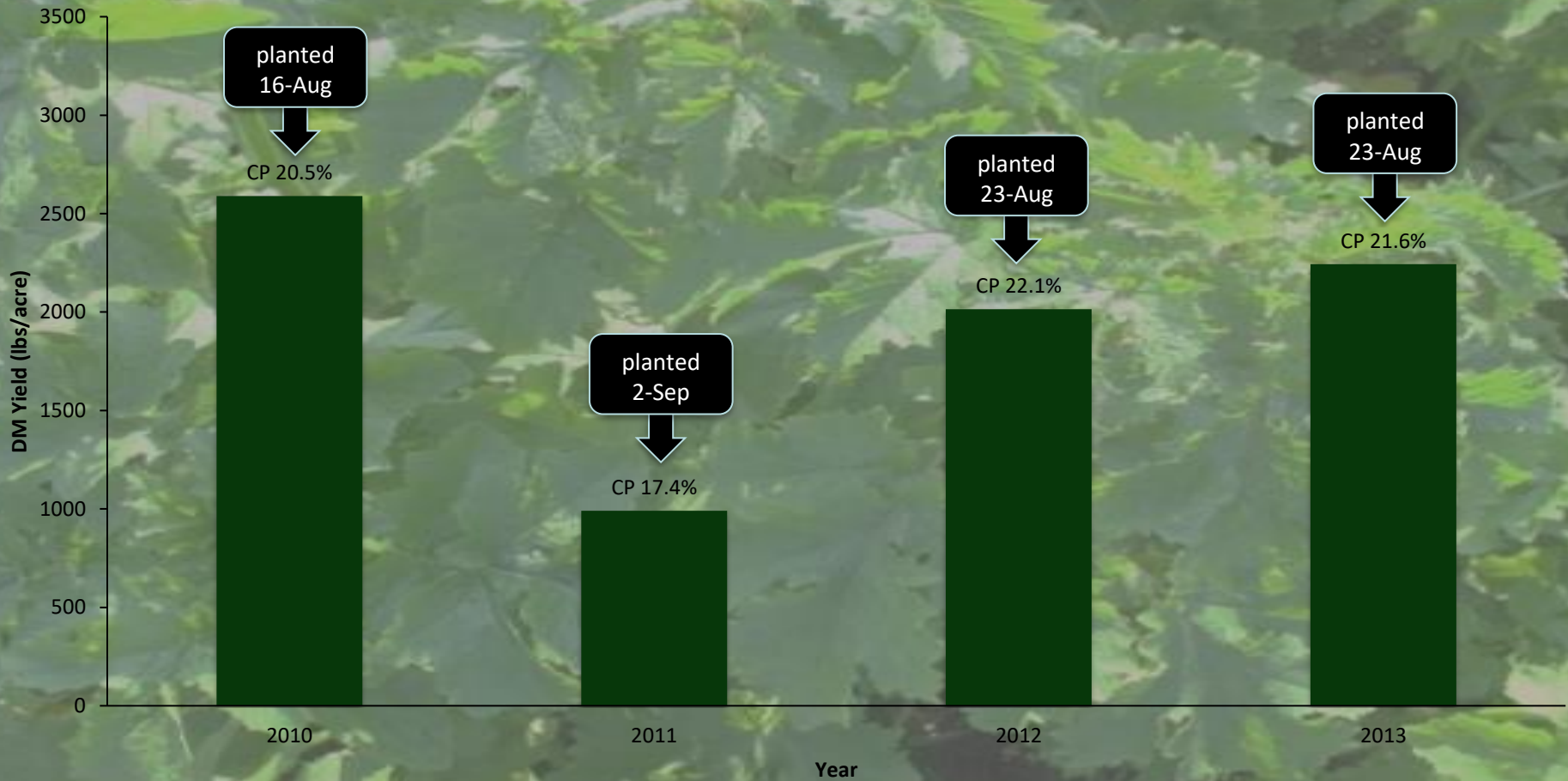
Barkant

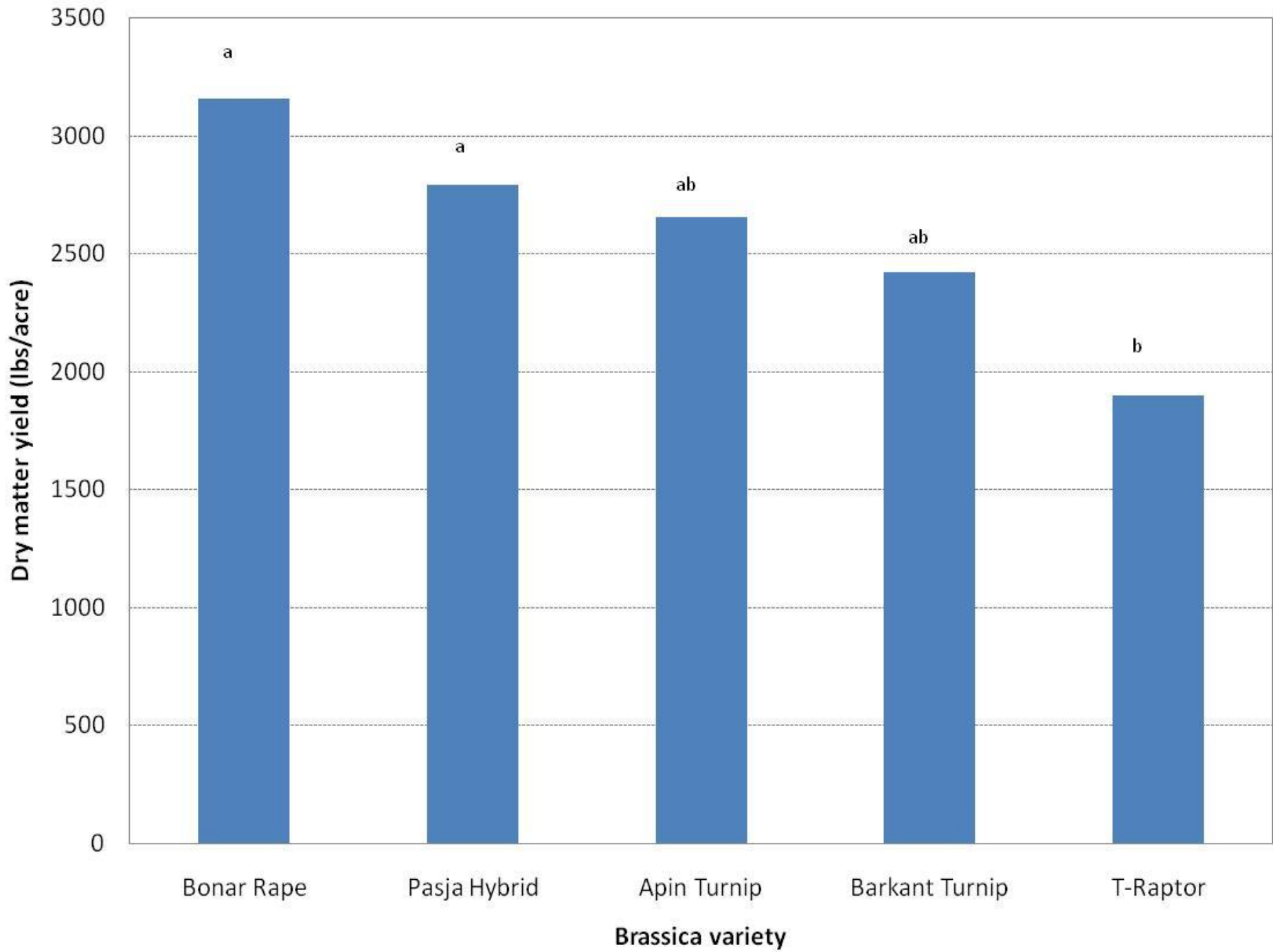
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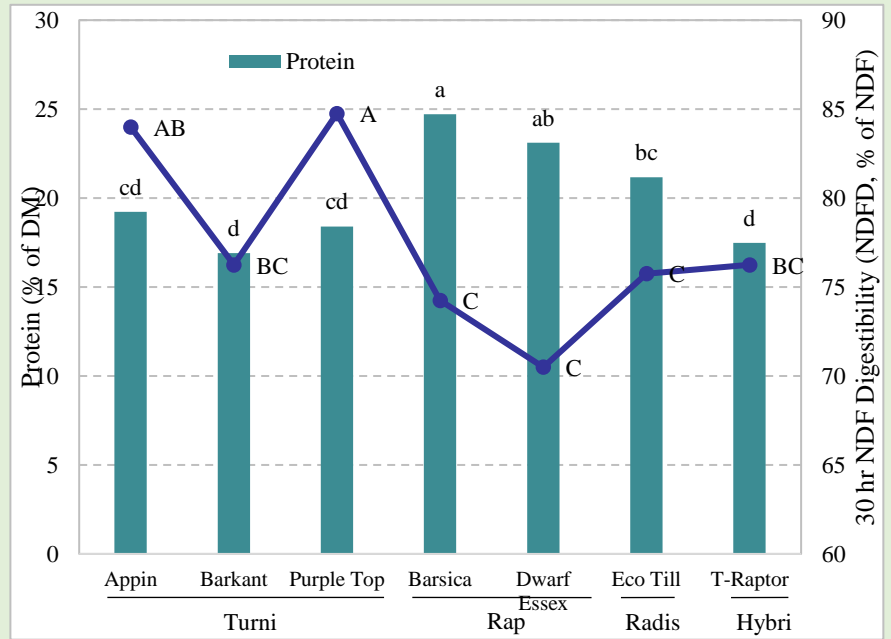
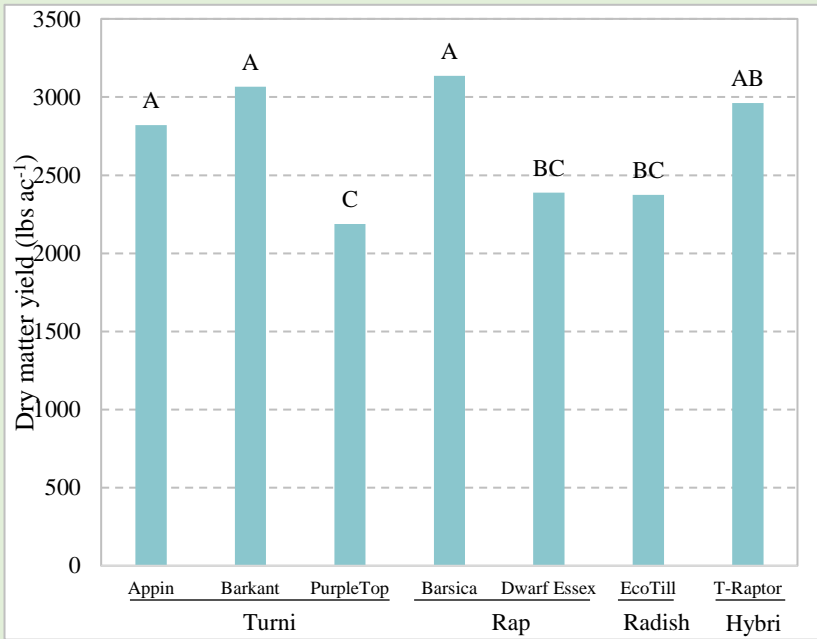
Appin



Forage Brassicas Average Yields







Cropping Systems



Cropping System

- **Rotation**
 - **Take first and/or second cut**
 - **25th of June and 1st of July planting**
 - **Graze 3x**
 - **Leave residue through winter**
 - **Reseed field in early spring**



Getting ready to seed oats/triticale



Sudangrass



**Grazing
corn**



Cool Season Annuals

- **Small grains for winter cover crops**
 - **Triticale alone on fields renovated in late summer**
 - **One Graze in spring before reseeding**
 - **Early feed if weather cooperates**
 - **Worse case scenario green manure**
 - **Reasonable dry matter for early feed**
 - **Good quality**
 - **Cows like to graze very palatable**

Spring and Winter Cereal Crops

Oats & Triticale in late summer (middle of August)

Same as planting triticale – higher seeding rate 150 lbs/acre

Planting two crops one for fall and one for spring grazing

Graze oats in fall – Planted Aug. 19th and grazed first of Oct.

High quality and palatable - cows milk best on oats

Same rotation – graze triticale in spring and reseed

Other considerations

- Seed costs can vary dramatically especially for BMR or other improved characteristics

| Species | Cost | |
|------------|--------------------------|------------------------------|
| | Dollars ac ⁻¹ | Dollars DM ton ⁻¹ |
| Millet | 34.8 | 18.91 |
| Sudangrass | 100.5 | 36.41 |
| Banteng | 204 | 1031 |

- Adding N can increase yields especially if planted early and cool temps
 - Consider costs of N source
 - Urea may be cheap but certified organic sources are very costly
 - Organic farms often use poultry manure since it is cheaper but it is very high in P