The Northeast is different.

Alfalfa acres sown with grass
Why so much alfalfa-grass?

Sub-optimal soil drainage

Comfort level feeding alfalfa-grass

Research supporting alfalfa-grass (Cornell and UW)

There have been improvements in alfalfa, some in grass.
MEADOW FESCUE
ITS CULTURE AND USES.
H.N. Vinall
“In the East, meadow fescue has shown itself to be almost as well adapted as orchard grass to the clay soils, and though not quite as productive, it is rather more palatable than the latter.”
What Grass Percentage is ideal in an alfalfa-grass mixture? (NY farm survey)

Ideal Grass Percentage

- 10%
- 20%
- 30%
- 40%
- 50%

2/3
Relative Importance of Factors on Alfalfa-Grass Ratio *(Before planting)*

<table>
<thead>
<tr>
<th>Favors Alfalfa</th>
<th>Factor</th>
<th>Favors Grass</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher</td>
<td>Soil pH (6.5)</td>
<td>Lower</td>
</tr>
<tr>
<td>More</td>
<td>Soil drainage</td>
<td>Less</td>
</tr>
<tr>
<td>e.g. (Tim)</td>
<td>Grass species</td>
<td>e.g. (OG)</td>
</tr>
<tr>
<td>Lower</td>
<td>Grass seeding rate</td>
<td>Higher</td>
</tr>
<tr>
<td>Less</td>
<td>Soil compaction</td>
<td>More</td>
</tr>
<tr>
<td>Later</td>
<td>Spring seeding date</td>
<td>Earlier</td>
</tr>
<tr>
<td>Earlier</td>
<td>Summer seeding date</td>
<td>Later</td>
</tr>
</tbody>
</table>
## Relative Importance of Factors on Alfalfa-Grass Ratio (After planting)

<table>
<thead>
<tr>
<th>Favor</th>
<th>Factor</th>
<th>Favors Grass</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Manure application</td>
<td>More</td>
</tr>
<tr>
<td>None</td>
<td>K fertilizer</td>
<td>More</td>
</tr>
<tr>
<td>More</td>
<td>K fertilizer</td>
<td>Less</td>
</tr>
<tr>
<td>Newer</td>
<td>Stand age</td>
<td>Older</td>
</tr>
<tr>
<td>Less</td>
<td>Cuts per season</td>
<td>More</td>
</tr>
<tr>
<td>Lower</td>
<td>Stubble ht. (season)</td>
<td>Higher</td>
</tr>
<tr>
<td>Higher</td>
<td>Stubble ht. (fall)</td>
<td>Lower</td>
</tr>
</tbody>
</table>
Yield Summary, recent research

In Northeast, alfalfa-grass outyields alfalfa.

DM yield is **0.1 to 0.4 t/a** higher for every 10 % unit increase in grass percentage.
Effect of grass% in mixture on grass CP

Very high fertility = 0.7% unit drop in CP in grass (with 10% unit increase in grass%)

High fertility = 1.0% unit drop in CP in grass

Ave. fertility = 1.5% unit drop in CP in grass

Grass% in mixed stand

CP in grass, %

Grass% in mixed stand

Effect of grass% in mixture on grass CP
Assume 1% unit change is significant. (HarvXtra was 5% higher NDFD)

1% unit difference in mixture NDFD

HarvXtra Alfalfa

Other Alfalfas

(Based on average grass NDFD, 2017)
Grass and Fiber Digestibility of Mixtures

MF was 10% higher in NDFD

Meadow Fescue

Other grasses

1% unit difference in mixture NDFD

(Based on average alfalfa NDFD, 2017)
Impact of Variety/Species selection on Fiber Digestibility of Mixtures
(If 1% unit NDFD in a mixture is significant)

Grass species selection matters

Alfalfa variety selection matters

Grass % in mixed stand

As low as 5% (any) grass will increase NDFD of an alfalfa-grass mixture 1% unit.

Grass NDFD is much higher than alfalfa NDFD.

What about delaying harvest (HarvXtra e.g.)?
How long can you delay harvest in alfalfa-grass mixtures?

Alfalfa 0.5% units/day decline
Grass 1.0% units/day decline

Based on 2017 5% increase in NDFD for Hx over normal alfalfa.
Reduced lignin alfalfa vs. MF

Hx averaged 14% lower lignin, 2017

MF averaged 17% lower lignin, 2017
Compared to TF, OG, Festulolium.

(All lignin values are weighted for yield)
Benefit of Seeding Hx or MF 2017

Blue line = No Hx or MF
Black line = HarvXtra added
Red line = Meadow fescue added
Green line = HarvXtra-MF mix

Based on 2017 NY data.
Hx 5% better than rest.
MF 10% better than rest.
So what is the downside?

Getting and keeping 20-30% grass

Current Recommendation
Meadow fescue (1-2 lb/a)
High Quality alfalfa (12-14 lb/a)
Grass% can increase rapidly

New York

Grass % in mixture

Meadow fescue  Orchardgrass  Festulolium

Grass % in mixture

2016

2017

2018

Meadow fescue  Orchardgrass  Festulolium
### 2019 Alfalfa-Meadow Fescue Research

19 MF varieties in pure stands and sown with alfalfa.

<table>
<thead>
<tr>
<th>Tetrax</th>
<th>SW Revansch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liherold</td>
<td>Pardus</td>
</tr>
<tr>
<td>Preval</td>
<td>Barika</td>
</tr>
<tr>
<td>Pradel</td>
<td>Barcrypto</td>
</tr>
<tr>
<td>Barvital</td>
<td>Laura</td>
</tr>
<tr>
<td>Cosmonaut</td>
<td>SW Minto</td>
</tr>
<tr>
<td>Driftless</td>
<td>Arni</td>
</tr>
<tr>
<td>Hidden Valley</td>
<td>Jogeva 47</td>
</tr>
<tr>
<td>Tored</td>
<td>Harlequin</td>
</tr>
<tr>
<td></td>
<td>Hyperbola</td>
</tr>
</tbody>
</table>
End of seeding year
25% MF (Late Sept. 2018)

Range of 0% visible to 25% MF

End of seeding year
Grass quality (A-G stands) is affected by region.
Differences among MF varieties

- Tetrax MF
- Pradel & Preval MF

<table>
<thead>
<tr>
<th>Year</th>
<th>Grass %</th>
<th>NDFD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>15%</td>
<td>7%</td>
</tr>
<tr>
<td>2018</td>
<td>40%</td>
<td>10%</td>
</tr>
</tbody>
</table>

15% decrease in Grass %
7% increase in NDFD
2018: Alfalfa-Grass, northern NY

4-cut ave., weighted by yield

Grass %

OG TF Pradel Preval Tetrax RC Tim

Meadow fescue
2018: 4 cuts: Effect of weather

Seeded in 2017

Grass %

Cut 1
Cut 2
Cut 3
Cut 4

OG
TF
Pradel
Preval
Tetrax
RC
Tim

Meadow fescue
What is the potential economic advantage of improved grass & alfalfa?

1%unit NDFD = 0.5 lb milk/cow/day
Including MF and Hx in mixtures (NY)

Variety and species changes are farm size neutral.

Assume Grass% = 30%

Based on NDFD:

2017 NY data (+3.5\% units)

1\% unit = 0.5 lb milk/day ($17/cwt)
Grass% in mixtures is affected by weather.
Grass selection requires region-specific guidelines.
This requires public forage researchers.
Forage crops are NOT a commodity!
Ranking of USA crop values, 2017

- Wheat: 4
- Cotton: 5
- Rice: 6
- Alfalfa: 3

Crop value, \$Billions vs. Federal funding, \$Millions

- Wheat: 10x
- Cotton: 8x
- Rice: 2.5x
- Alfalfa: 3, 4, 5, 6

Ranking of USA crop values, 2017
The loss of forage public researchers impacts grass more

Monetary value, $

- Forage for ruminants,
- Food security,
- Animal welfare,
- Ecosystem services

Federal & State support for Forage crops
Pros

- Healthier animals
- Longer stand life
- Less winterkill
- Less traffic damage
- Fewer pests & disease
- Improved soil health
- Less erosion

Cons

- Variable forage quality
- Limited weed control
- Roundup-Ready alfalfa

Summary - Pros & Cons of Alfalfa-Grass
Establish RR-alfalfa and spray for weeds. Interseed grass into pure alfalfa stand.

Has been done successfully in spring and late summer after spraying Roundup.
Alfalfa-Grass = Milk + Healthy Cows

Alfalfa-Grass is not easy to manage

20-30% grass in mixture is ideal

Alfalfa = GDD, Grass = Daylength

Meadow fescue looks good (Northeast)

Choose late maturing grass varieties.
The End