Forage Species Selection

Numerous Species

What is your favorite pasture species?

What grass do you see as the most popular with producers?

What factors influence how a species will grow?

- Soil
  - type, texture, pH, fertility, drainage…
- Weather
  - Rain, drought, heat, cold
- Animals
  - Cows vs. horses vs. sheep vs. goats vs. ??
- Producer Management
  - Grazing interval, fertilizer, paddock size

Understanding and Managing Plant Growth

Growth & Energy Points

Growing point

Energy storage
Factors to Consider in Selection

- Adapted to Grazing/Harvest System
- Adapted to Soils
- Adapted to the Climate
- Palatability
- Longevity
- Does it Fit Producer Philosophy

Species & Varieties

- Lots of differences
  - Winter hardiness
  - Drought & Moisture tolerance
  - Palatability & Digestibility
  - Maturity dates
  - Growth Habit (prostrate vs upright)
- Origin of genetics

Forage Breeding Advancements

- Grass maturity
- Winterhardiness
- Fiber digestibility
  - More leaf, less stem
  - Softer plants (less lignin)
- Sugar Content

Species, Varieties & Mixtures

- Adapted to Drier Soils
  - Orchardgrass
  - Bromes
  - Tall Fescue
  - Reed Canarygrass
  - Red Clover
  - Alfalfa
  - Chicory
Adapted to Wetter Soils
- Meadow Fescue
- Perennial Ryegrass
- Timothy
- Kentucky Bluegrass
- Tall Fescue
- Reed Canarygrass
- Festulolium
- Birdsfoot Trefoil
- White Clover

Shorter Lived Perennials
- Festuloliums
- Perennial Ryegrass
- Italian/Hybrid Ryegrass
- Alaska Brome
- Red Clover
- Alfalfa
- Chicory

Longer Lived Perennials
- Orchardgrass
- Reed Canarygrass
- Timothy
- Meadow Fescue
- Bluegrass
- Tall Fescue
- Smooth Brome
- White Clover

Establishment
- Fast
  - Festulolium
  - Perennial Ryegrass
  - Meadow Fescue
- Moderate
  - Orchardgrass
  - Alfalfa
  - Clovers
  - Birdsfoot Trefoil
  - Brome (Meadow)
- Slow
  - Kentucky Bluegrass
  - Tall Fescue
  - Timothy
  - Reed Canarygrass
  - Brome (Smooth)

Palatability
- More Palatable
  - Meadow Fescue
  - Perennial Ryegrass
  - Orchardgrass
  - Brome
  - Timothy
  - Kentucky Bluegrass
  - Birdsfoot Trefoil
  - White Clover
  - Red Clover

Palatability
- Less Palatable
  - Tall Fescue
  - Reed Canarygrass
  - Alfalfa?
  - Over mature plants
**Grazing Tolerance**
- Best
  - Kentucky Bluegrass
  - Perennial Ryegrass
  - White Clover
  - Birdsfoot Trefoil
  - Festulolium
  - Meadow Fescue
  - Tall Fescue
  - Orchardgrass
  - Brome (Meadow)
- Least
  - Alfalfa
  - Timothy
  - Red Clover
  - Reed Canarygrass
  - Brome (Smooth)

**Sacrifice Areas**
(Can Survive Abuse)
- Tall Fescue
- Bluegrass
- Reed Canarygrass (rhizomes)
- Clover +/-

**Dry Down for Hay**
- Fast Drying
  - Orchardgrass
  - Timothy
  - Tall Fescue
  - Reed Canarygrass
  - Brome
  - Kentucky Bluegrass
- Slower Drying
  - Meadow Fescue
  - Alfalfa
  - Birdsfoot Trefoil
  - Festulolium
  - Perennial Ryegrass
  - White Clover
  - Red Clover

**Maturity**

<table>
<thead>
<tr>
<th>Species</th>
<th>Range in Maturity (heading date)</th>
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<tbody>
<tr>
<td>Bromegrass</td>
<td>May 9 to May 23</td>
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<tr>
<td>Tall Fescue</td>
<td>May 14 to May 26</td>
</tr>
<tr>
<td>Festulolium</td>
<td>May 17 to May 22</td>
</tr>
<tr>
<td>Orchardgrass</td>
<td>May 10 to May 26</td>
</tr>
<tr>
<td>Ryegrass</td>
<td>May 14 to June 1</td>
</tr>
<tr>
<td>Timothy</td>
<td>May 22 to June 5</td>
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</tbody>
</table>

2012 data from Cornell Trials

**Yield Potential**
- Highest
  - Tall Fescue
  - Reed Canarygrass
  - Alfalfa
  - Red Clover
  - Meadow Fescue
  - Orchardgrass
  - Brome (Smooth)
- Lowest
  - Kentucky Bluegrass
  - White Clover
  - Birdsfoot Trefoil
  - Timothy
  - Perennial Ryegrass
  - Festulolium
  - Brome (Meadow)

**Yield**

<table>
<thead>
<tr>
<th>Mixture</th>
<th>Yield (t/a/yr)</th>
<th>% Stand</th>
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<tbody>
<tr>
<td>Alfalfa</td>
<td>8.2</td>
<td>80</td>
</tr>
<tr>
<td>Meadow Fescue</td>
<td>5.1</td>
<td>31</td>
</tr>
<tr>
<td>Orchardgrass</td>
<td>6.5</td>
<td>59</td>
</tr>
<tr>
<td>Tall Fescue</td>
<td>6.1</td>
<td>79</td>
</tr>
<tr>
<td>Alaska brome</td>
<td>5.3</td>
<td>5</td>
</tr>
<tr>
<td>Timothy</td>
<td>4.5</td>
<td>21</td>
</tr>
<tr>
<td>Alf – Meadow fescue mix</td>
<td>8.7</td>
<td>82</td>
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<tr>
<td>Alf – Orchardgrass mix</td>
<td>8.4</td>
<td>83</td>
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<tr>
<td>Alf – Tall fescue mix</td>
<td>8.2</td>
<td>81</td>
</tr>
<tr>
<td>Alf – Alaska brome mix</td>
<td>8.0</td>
<td>82</td>
</tr>
<tr>
<td>Alf – Timothy mix</td>
<td>8.3</td>
<td>83</td>
</tr>
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</table>

Four years of data at Rock Springs Research Center
**Mixture Effect on Forage Yield**

![Graph showing forage yield with different numbers of species in mixture](image)

**Reasons for Mixtures**
- Diversity
- Adds Stability to Production
- Fast Starters help to Nurse Slow Starters
- Legumes Help Feed Grasses

**Which Mix?**

- **King’s Grazing Mix** (pg. 9)
  - Highly palatable grasses & legumes for good soils with adequate moisture but not excessive.
  - Orchardgrass, ryegrass, meadow fescue base
  - Chicory - forb with tap root, rich in minerals

- **Hillside Mix** (pg. 6)
  - Highly palatable drought resistant species
  - Orchardgrass, meadow brome base
  - Ryegrass helps act as nurse crop to slower establishing brome and orchardgrass

- **Greenfast Mix** (pg. 7)
  - Fast starting
  - Festulolium, orchardgrass, ryegrass base
  - Not drought tolerant, prefers cooler climate
**Alternative Forages**

- Sorghum-sudan
- Sudangrass
- Millets
  - Use BMR-6 varieties
- Teff

**Summer Annuals**

**Annual Production Curve for Cool Season Grass**

- Spring Flush
- Summer Slump

**Cool Season Annuals**

- Straight Species
  - Spelt
  - Wheat
  - Triticale
  - Rye
  - Barley
- Annual & Italian Ryegrasses
- Oats
- Peas

**Mixtures**

- Many combinations!

### Green Spirit in New York

<table>
<thead>
<tr>
<th>Seed No.</th>
<th>31-Jul</th>
<th>28-Aug</th>
<th>13-Oct</th>
<th>Total Season</th>
<th>1-Jul</th>
<th>28-Aug-13-Oct</th>
<th>% Heading</th>
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<tbody>
<tr>
<td>Jumbo</td>
<td>3.20</td>
<td>1.07</td>
<td>1.34</td>
<td>6.61</td>
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<td>74</td>
<td>30</td>
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<td>Lumbria 1</td>
<td>3.00</td>
<td>1.21</td>
<td>1.05</td>
<td>5.26</td>
<td>100</td>
<td>70</td>
<td>30</td>
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<tr>
<td>Balthasa</td>
<td>2.14</td>
<td>1.02</td>
<td>1.51</td>
<td>4.67</td>
<td>74</td>
<td>56</td>
<td>20</td>
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<tr>
<td>Hercules</td>
<td>2.23</td>
<td>1.43</td>
<td>1.26</td>
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<td>70</td>
<td>50</td>
<td>20</td>
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<tr>
<td>Vanhall</td>
<td>2.85</td>
<td>1.14</td>
<td>1.00</td>
<td>4.99</td>
<td>100</td>
<td>86</td>
<td>30</td>
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<tr>
<td>Tuff</td>
<td>2.11</td>
<td>0.67</td>
<td>0.64</td>
<td>3.38</td>
<td>100</td>
<td>52</td>
<td>30</td>
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<tr>
<td>Spring Triticale</td>
<td>2.07</td>
<td>0.00</td>
<td>0.00</td>
<td>2.07</td>
<td>100</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Remington</td>
<td>1.21</td>
<td>0.82</td>
<td>0.86</td>
<td>2.83</td>
<td>100</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

LSD (.05) | 0.44   | 0.27   | 0.23   | 0.80         |

CV (%)    | 17.9   | 10.8   | 12.3   | 14.1         |
Pasture Rotation

- Y1-4: Legume/Grass Pasture
- Y5 Spring: Graze 1st growth
- Y5 Summer: BMR Sorghum-sudan or Millet
- Y5 Fall: Plant cool season annuals (trit.,ryegrass)
- Y6 Spring/summer: Graze or harvest twice
- Y6 late Summer: Establish new pasture

Seeding Methods & Equipment

- Broadcast/Animal Tramping
- Frost Seeding
- No-till Drill
- Conventional Drill
- Drop or Packer Seeder

Broadcast Seeders

Traditional Seed Drill

No-till Seed Drills

What makes a drill no-till?
Drill seed delivery types

Packer Seeder

Depth & Seeding Rate
- Seeding Depth
  - Small Grains Sorghum Sudans – about 1”
  - Small Seeds – 1/8 to ¼”
    • About 10% on surface
- Seeding Rate
  - Too little seed = weeds and low 1st year yields
  - Too High – will make mix less diverse and cost money.

How do I set my equipment?
- The drill does not have my mixture on the chart!!!!
- Charts on equipment are not accurate!
  - Every lot of seed flows different
  - Calibration saves money and pays!

The Hard Ways
- Don’t worry about rate.
- Trial and Error
- Do the math by yourself (weight/area)
  - Collect seed, weight it, figure out area
Read Owners Manual

- Some equipment has short cut methods such as turning a wheel 30 times and weighing seed and multiplying by a factor.

Tools Needed

- Tape measure or wheel
- Something to collect seed with
  - Drill - sandwich bag
  - Drop seeder - tarp or tray
- Postal or dietary scale
- Calibration Chart
  - Correct row spacing and distance

Drill

- Determine proper rate
  - Use calibration sheet to determine grams or Oz. to collect.
- Measure 100 feet (add extra foot for seed drop)
- Take hoses off 2 - 4 rows and attach sandwich bag with rubber band or twist tie.

Drill continued

- Run drill 101 feet.
  - Check for seeding depth on rows with seed drop
  - Weigh bags with seed.
  - Average wt should be close to goal.
- If depth or rate is off, make adjustments and redo until acceptable.
- Also check for seed to soil contact. Soil needs to be firm. (usually should be packed after seeding)

Packer/Drop Seeder

- Attach tray under part of seeder
  - Get calibration chart for width of tray and distance collected
  - Follow same procedure as drill.
  - Or
- Lay large tarp on sod or pavement
  - Determine square ft of collected dropped seed and get an appropriate calibration sheet.
  - Carefully collect and weigh seed.
  - Make adjustments
Drop Seeder

- Distance ft. X width ft. = area sq. ft.
  Divide by 43,560 to get acreage
- Example
  - 100 ft collection distance from 10 ft drop seeder
  - Area = 100ft X 10ft = 1000 ft²
  - 1000 / 43560 = 0.023 Acre
  - Wt = Collected 8 oz or 0.5 lbs
  - 0.5 lb / .023 Acre = 21.8 lb/A

When Can I Start Grazing a New Seeding?

- It should be well established with a good root system.
- High risk of animals pulling up by the roots when first growth is grazed.
- Best practice is to brush hog first growth (and weeds) when ~12” or wait longer and take as a hay cutting. (60+/− days)
- Then start grazing when regrowth is 12-18”

When Can I Start Grazing a New Seeding?

- Leave at least a 4” stubble.
- Late summer seeding – do not graze til spring
- If grazing is only option, graze quickly and lightly at 12-15” (ideally only taking top 6”)

Scenerios

- 5 min.
- Small groups
- Report: 2 min/group

Scenerio 1

- Low lying field near the barn
- Often used as a loafing area
- Has a slope so need quick cover

Scenerio 2

- Larger pasture on top of hill
- Tends to get dry in the summer
- Animals continuously graze this large pasture
Scenerio 3

- Excellent fertility ground
- Tends to be on the wetter side
- I have picky dairy cows and want the most palatable pasture possible

Scenerio 4

- I have a well drained field that I want to graze early and late in the season but make dry hay from during the summer

Scenerio 5

- Available pasture is limited but need to reseed this old pasture that has lots of weeds
- Field is decent soil and will be used mainly for beef but I have sheep also
- How can this pasture be rotated and reseeded?
- What species in new pasture?

Scenerio 6

- I have sandy soil and will be grazing horses
- I only want to reseed this pasture once so I want the highest yielding, longest lived species

Thank-you