



Forage Systems to Increase Productivity

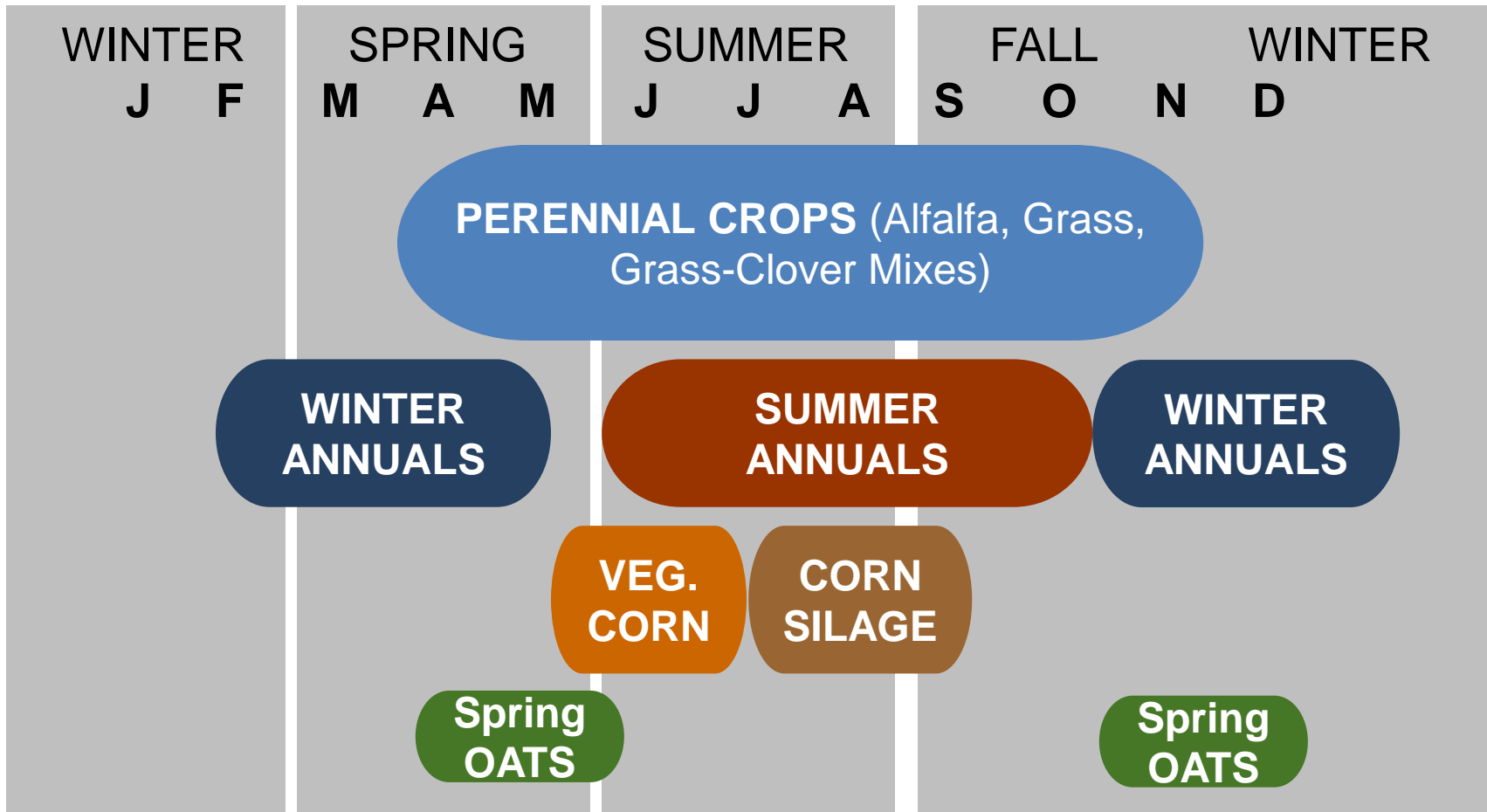
Tim Fritz, Forage Agronomist



Forage Systems



Forage Systems



Making Forage Choices

- Is the crop adapted to your farms soils and expected weather?
- Do the planting and harvest dates work?
- How will the crop impact crop rotation and total farm productivity?
- Do you have adequate storage capacity?
- What nutritional value does the crop bring to the ration?

Forage Nutrition

- Dense Energy (starch)
 - Corn, Forage Sorghum and Soft Dough Small Grains
- Protein
 - Legumes (Alfalfa and Clovers)
- Fiber Energy & Balanced Protein
 - Vegetative grasses
 - Perennial Grasses
 - Annuals harvested before heading

Legumes



Perennial Legumes

- Alfalfa
 - Drought tolerant
- Red Clover
 - High yield in short rotation
 - Tolerant to wetter soils
 - Better Protein Quality
 - Lower soluble protein
- White and Ladino Clover
 - Tolerant to wet soils and long lived

Grass Breeding Advancements

- Maturity to match alfalfa
- Fiber digestibility
 - More leaf, less stem
 - Softer plants (less lignin)
- Sugar Content



© Dan Undersander

Perennials

	Tons of DM	CP	NDF	NDFd30	KD Rate
Alf Grass	7.9	21.5	36.6	56.2	4.6
GrassMix	6.2	12.9	54.2	71.3	6.4
Alfalfa	8.3	22.8	33.2	49.6	4.3
Red Clover	7.3	20.8	34.9	49.5	4.5

2014 Data from King's AgriSeeds Mount Joy Research Plots.

Mount Joy weather was relatively dry.

Alfalfa, Red Clover and Alf Grasses were cut 5 times.

Grass Mixes were cut 4 times

Quality Data is an average from 1st and 3rd cuttings using CVAS

Corn Breeding Advancements

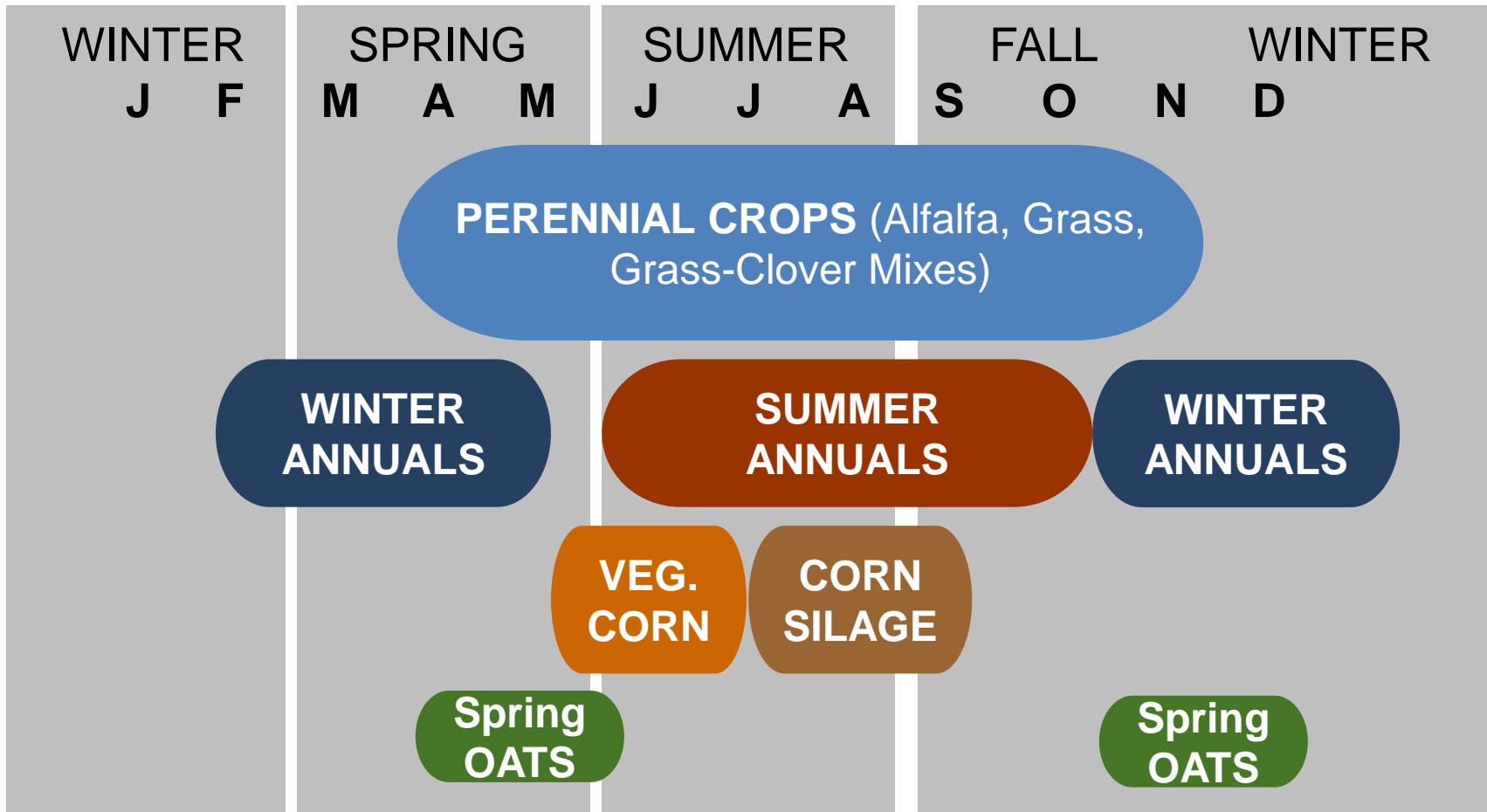
- Yield
- Fiber digestibility
 - Conventional
 - BMR
- Starch Digestibility
 - Floury Starch

Sorghums and Sudans

- High Sugars
- Fiber Digestibility
 - Delayed Maturity
 - BMR
- Improved Agronomics



Forage Systems



Forage Systems



Example Farm 1

- Deep Well Drained Soils



Example Farm 2

- Droughty Soils



Winter Annual Forages



January 21, 2016

Cool Season Annuals

- Straights
 - Spelt
 - Wheat
 - Triticale
 - Rye
 - Barley
 - Annual & Italian Ryegrasses
 - Oats
- Mixtures
 - Many combinations!
 - Add legumes crimson clover, hairy vetch, winter peas for more protein.



FORAGE YIELD COMPARISON - TRICAL® TRITICALE VS RYE

	BOOT STAGE	HARVEST	SOFT DOUGH	HARVEST
	<i>HARVEST</i> 0% Water T/A	<i>DATE</i>	<i>HARVEST</i> 0% Water T/A	<i>DATE</i>
TRICAL® 815				
2003-2004	3.40	26-Apr	6.84	10-Jun
2004-2005	4.57	2-May	10.00	16-Jun
2005-2006	4.51	24-Apr	9.20	9-Jun
2006-2007	4.53	3-May	8.86	5-Jun
2007-2008	5.20	30-Apr	10.69	10-Jun
AVG	4.44		9.12	
EARLY GRAZER RYE				
2003-2004	2.12	6-Apr	5.11	30-Apr
2004-2005	2.16	7-Apr	6.67	13-May
2005-2006	2.29	3-Apr	4.21	24-Apr
2006-2007	2.53	4-Apr	4.12	9-May
2007-2008	2.88	10-Apr	5.91	6-May
AVG.	2.40		5.20	
WHEELER RYE				
2003-2004	3.42	22-Apr	5.85	13-May
2004-2005	3.80	27-Apr	5.72	13-May
2005-2006	3.28	20-Apr	6.19	15-May
2006-2007	4.04	23-Apr	6.72	16-May
2007-2008	2.98	24-Apr	6.68	23-May
AVG.	3.50		6.23	

Research Location-VPI North Piedmont Research & Ext. Ctr., Orange, VA.

January 21, 2016





January 21, 2016

Winter Annuals



January 21, 2016

2004 Penn State Landisville



January 21, 2016

April 29



Rye already past prime

January 21, 2016

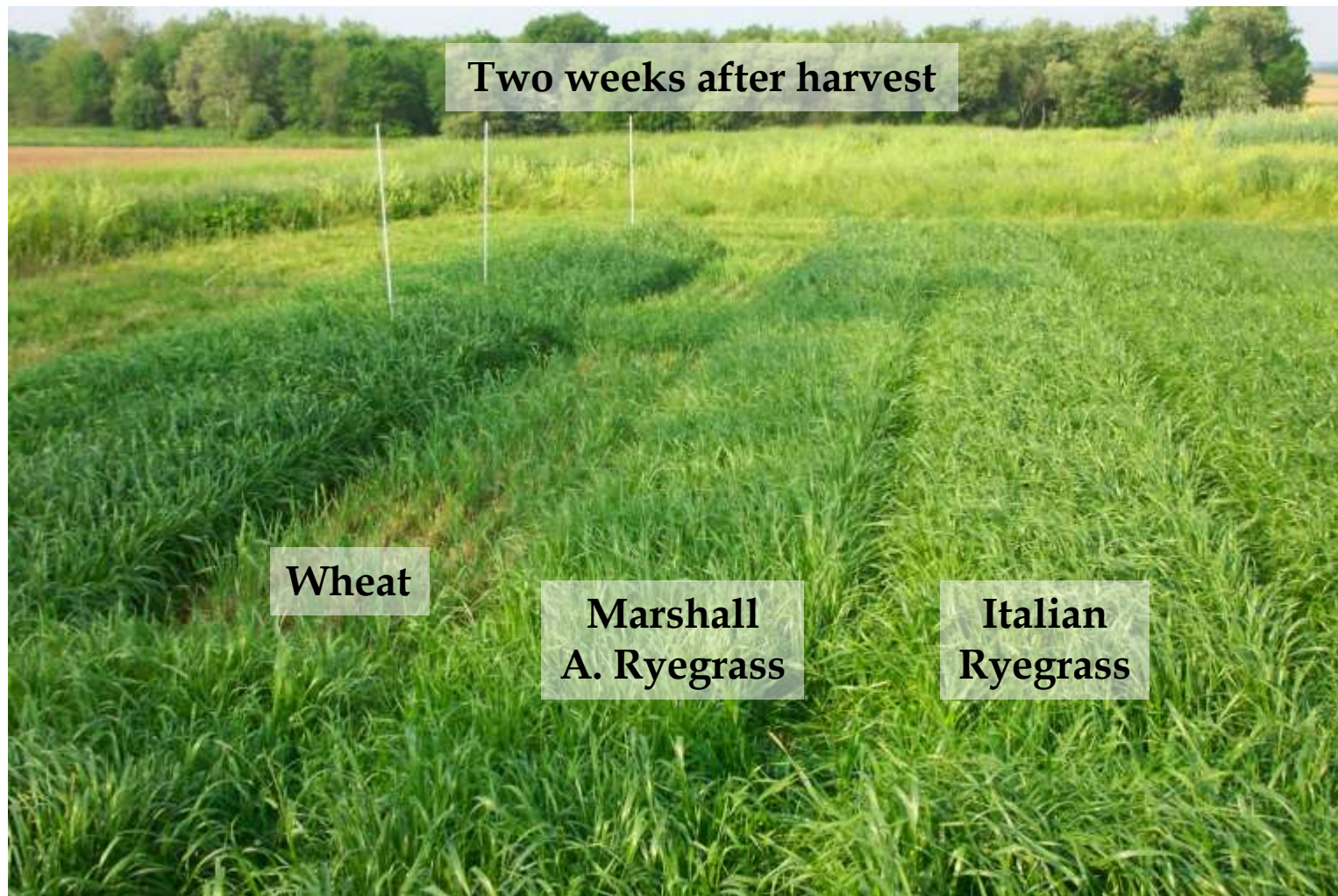


April 29



January 21, 2016

May 13

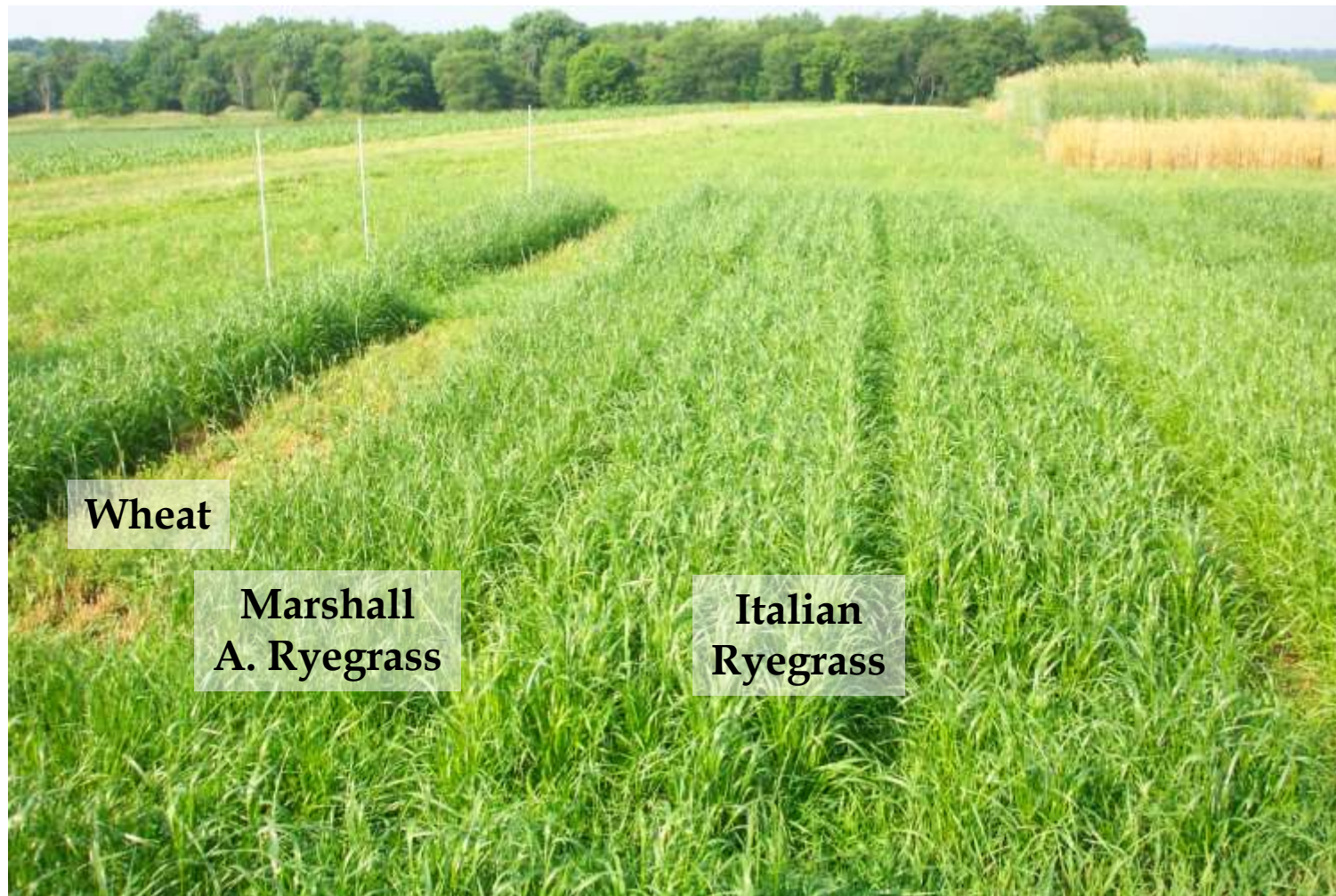


May 20



January 21, 2016

June 8



Wheat

**Marshall
A. Ryegrass**

**Italian
Ryegrass**

January 21, 2016

Winter Annual Mixtures



Soil Builder Plus

Summer Annuals

- Forage sorghums
- Sorghum-sudans
- Sudangrass
- Millets



BMR Forage Sorghum



January 21, 2016



Brachytic Dwarf BMR

A major advancement in standability and ease of harvest

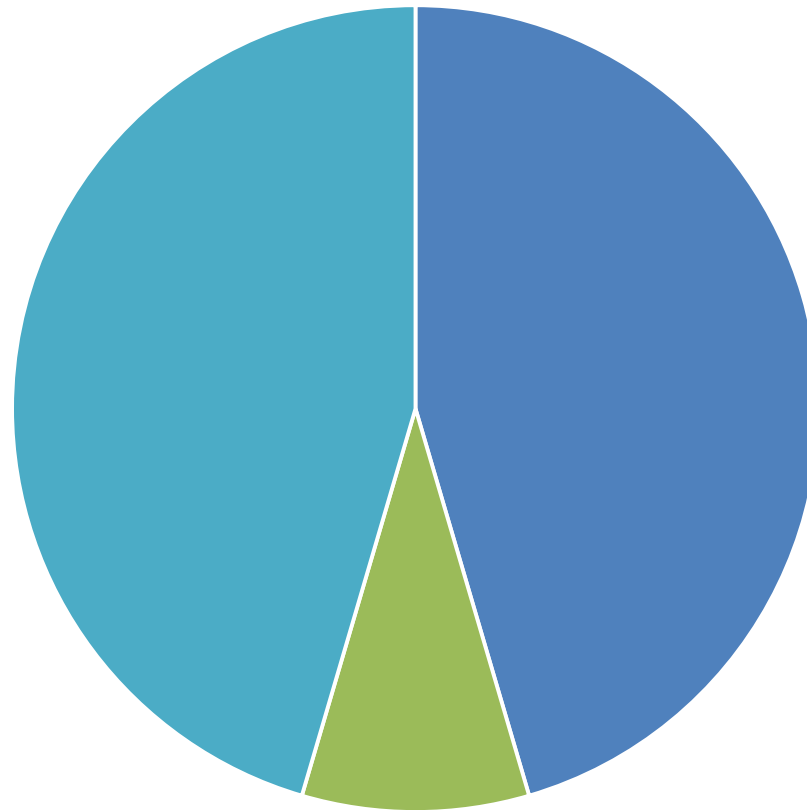


BMR Sudangrass

- Easy Dry Down
- High Yield
- Drought Tolerant
- Strong Regrowth
- High Quality
- Multi-Cut / Graze



Forage Cropping Systems

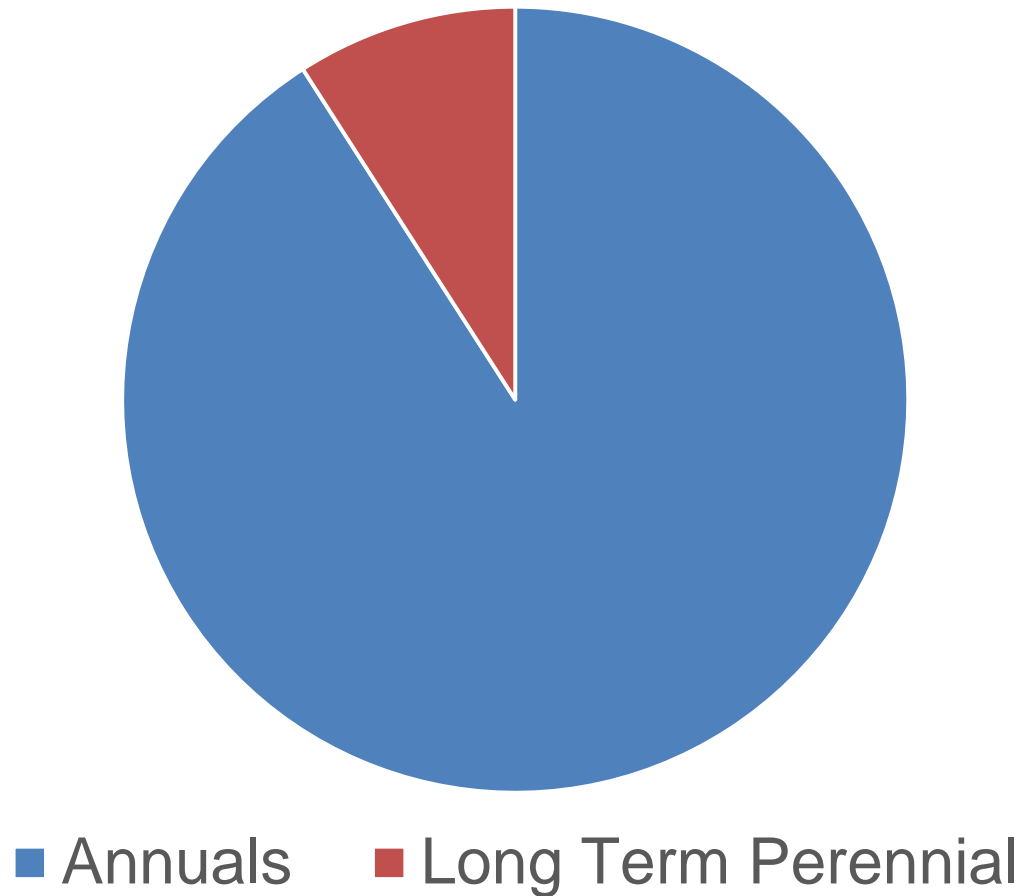


■ Annuals ■ Long Term Perennial ■ Short Term Perennial

Example 4 Year Rotation

- Yr 1-2 Barduro Red Clover
- Yr 3 Corn Silage followed by Forage Sorghum
- Yr 3 fall plant Winter Annual mixture
- Yr 4 Harvest WA followed by Sudangrass
- Yr 4 Seed Barduro Red Clover

Forage Cropping Systems



Example Rotation

- Y1:
 - Harvest barley, wheat or spelt
 - Sudangrass or millet followed by Rye.
- Y2:
 - Harvest Rye at flag leaf
 - Short Season Corn
 - BMR Forage Sorghum (harvest at frost)
 - Triticale and Annual Ryegrass
- Y3:
 - Harvest Triticale and Annual Ryegrass Twice
 - BMR Forage Sorghum harvest at soft dough
 - Plant barley, wheat or spelt

Annual Yield Potential

Crop	Dry Matter	65% Moist	11% Moist
Triticale Plus 1 st cut	2.85	8.13	3.2
Triticale Plus 2 nd cut	3.15	9.00	3.5
BMR S. sudan 1 st	2.62	7.47	2.9
BMR S. sudan 2 nd	2.58	7.38	2.9
Everleaf Oats	2.89	8.17	3.2
Total 2008 Yield	14.09	40.15	<u>15.7</u>

2008 Leola, PA field weights.

Forage Planning

- Crop Rotation
 - Key for sustained yield and profitability
- Crop Selection
 - Adapted to soils, climate, harvest methods, and nutritional needs.
- Team Approach
 - Forage Agronomist
 - Nutritionist
 - Financial Consultant

Forage Planning

- Bridging Agronomy, Nutrition and Profitability
 - Yield with risk management
 - Quality with risk management
- Requires Multiple Crops

Forage Nutrition

- Dense Energy (starch)
 - Corn, Forage Sorghum and Soft Dough Small Grains
- Protein
 - Legumes (Alfalfa and Clovers)
- Fiber Energy & Balanced Protein
 - Vegetative grasses
 - Perennial Grasses
 - Annuals

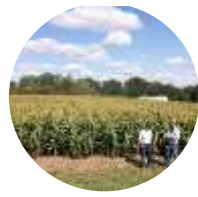
Attend Field Days



Oakley Research Farm



January 21, 2016



Questions?



60 N Ronks Rd, Suite K
Ronks, PA 17572
(717) 687-6224