

Linking Crop Rotations & Feeding Programs



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Many Ways to Feed Cows

- Must follow some basic rules
- Some strategies are more effective than others
- Balance
 - Cow Health
 - Herd Production
 - Feed Resources
 - Economics

Many Ways to Grow Crops

- Certain Crops fit Certain Situations
- Some strategies are more effective than others
- Balance
 - Soil resources
 - Production efficiency
 - Economics
 - Environment

.....the Chicken or the Egg

Crop Rotation matched to Herd Needs

Production Strategy matched to Crop Resources

Adapting Resources and Needs

Sometimes minor changes make all the difference

- Facilities can be renovated
- Land can be improved
- Herd characteristics can be changed
- Management can adjust

But will the change be adequate and does it match you?

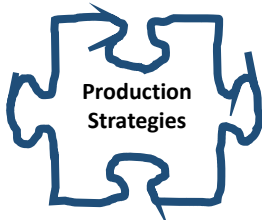
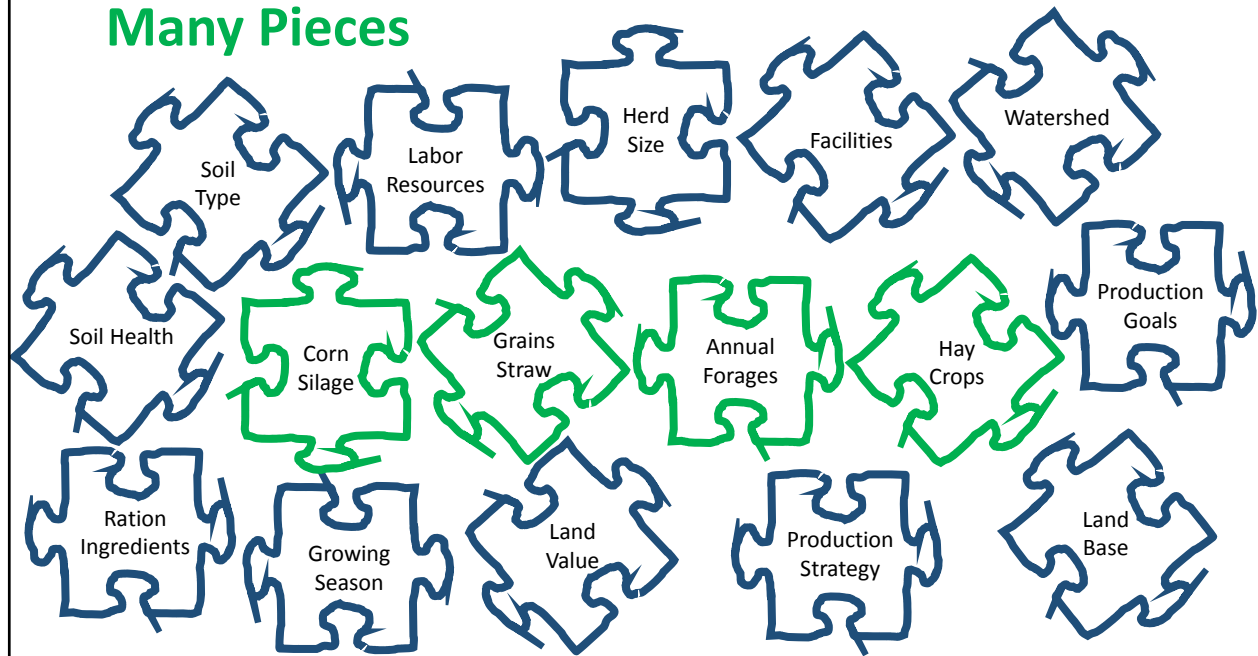
Does the Peg fit the Hole?



Assessing the Situation

- S** Strengths – What do you do well?
- W** Weaknesses – What areas could be improved?
- O** Opportunities – What resources can you capitalize on?
- T** Threats – What areas could cause major problems?

Many Pieces



Conventional

- Land base to meet forage needs

Pasture Based

- Contiguous acres
- Winter Forage Supply

Does the system match:

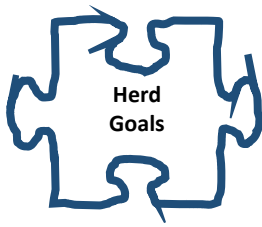
- Land Resources
- Facilities
- Available Markets

GMO Free

- Land base to meet forage needs
- Land base to meet grain needs

Organic

- Land base to meet forage needs
- Land base to meet grain needs



Herd Size

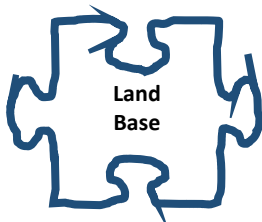
- Optimize production efficiencies
- Spread cost across production units

Does the system match:

- Land Resources
- Facilities
- Labor Resources
- Storage Infrastructure

Production Goals

- Milk production in line with inputs
- Ration Ingredients meet Herd Goals
- Does the facility support level of production



Crop Rotation

- Soil Health
- Pest Management

Owned/Rented

- Core Acres
- Land security
- Investments in Improvements

Does the system match:

- Soil Management Goals
- Crops
- Forage Needs

Soil Type / Growing Season

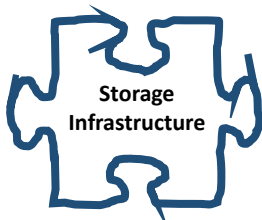
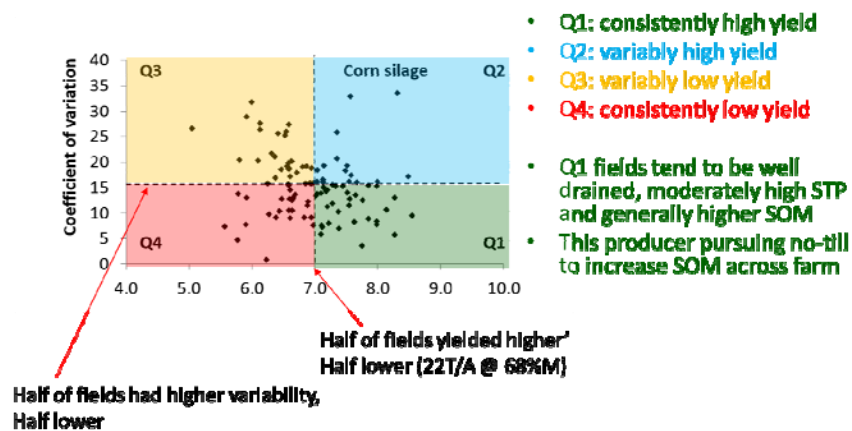
- Support desired crops
- Timely Harvest

Equipment

- Timely Harvest
- Match Crop Operation

Dairy Farm Case Study

14 year study of yield variation



Carry Over

- Feed Consistency
- Buffer against Crop Shortfalls

Footprint

- Adequate Space to Store Properly
- Minimize Losses

Does the system match:

- Herd Size
- Crop Types
- Forage Needs

Intended Use

- Quality matches Animal Group
- Special Considerations
 - Low Potassium

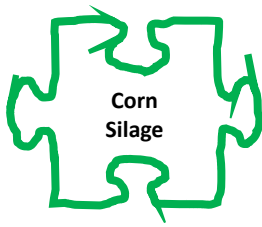
Storage Capacity

Bunk	Avg. Current DM Density lbs DM/cuft	Capacity at Current Densities tons (As Fed)	Capacity at 16 tons (As Fed) lbs/cuft	Capacity at 18 tons (As Fed) lbs/cuft
Corn 1 (Bunk 1)	12.8	1553	1942	2185
Corn 2 (Bunk 3)	10.2	815	1278	1437
Corn 3 (Bunk 5)	12	1640	2186	2460
Corn 4 (Bunk 6)	15.4	2637	2739	3082
SUM		6644	8145	9163
Difference			1501	2519
Haylage 1 (Bunk 2)	12.4	919	1186	1335
Haylage 2 (Bunk 4)	11.7	1732	2368	2664
SUM		2651	3555	3999
Difference			903	1348

Excess Feed

- Right Structure, Right Location





Does the system match:

- Herd Needs
- Land Base

Soil Type / Growing Season

- Consistent Production
- Weather influences quality

Pest Management

- Short Rotations

Soil Type / Growing Season

- Consistent Production
- Weather influences Quality

Soil Health

- Short Rotations
- Cover Cropping

2016 NY Corn Silage Hybrid Trials

Field Resiliency

Madrid

- Corn – Sod Rotation
1st yr. corn after sod
- History of manure

Higher Organic Matter Content

Water Holding Capacity
Nutrient Holding Capacity

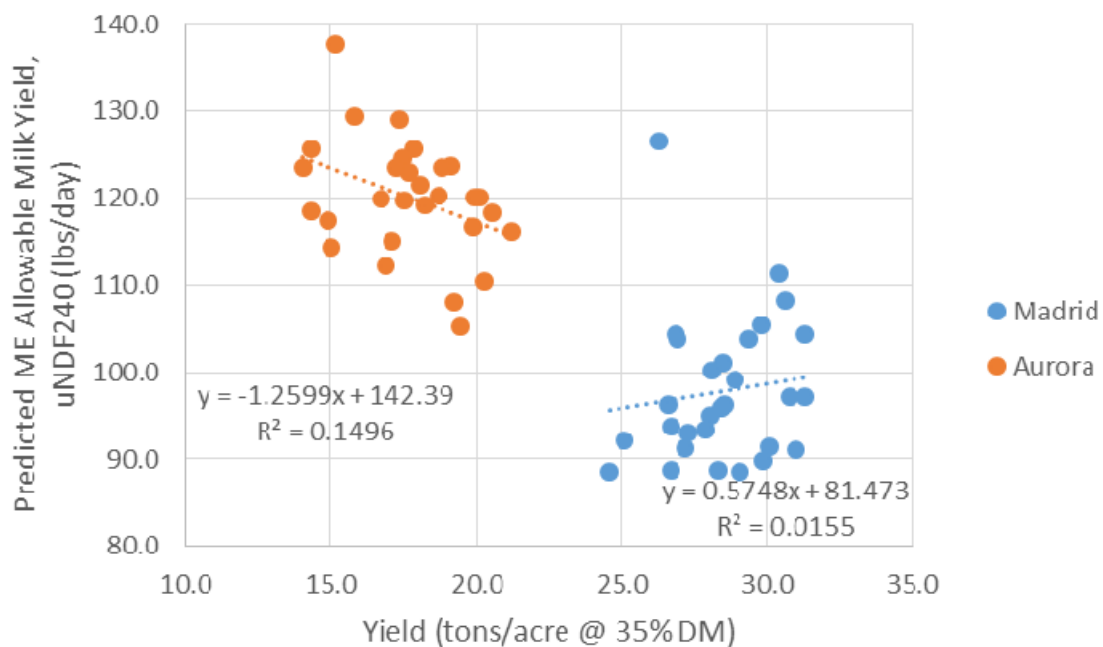
Aurora

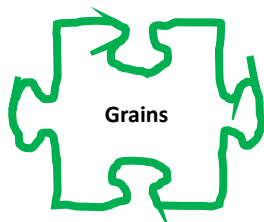
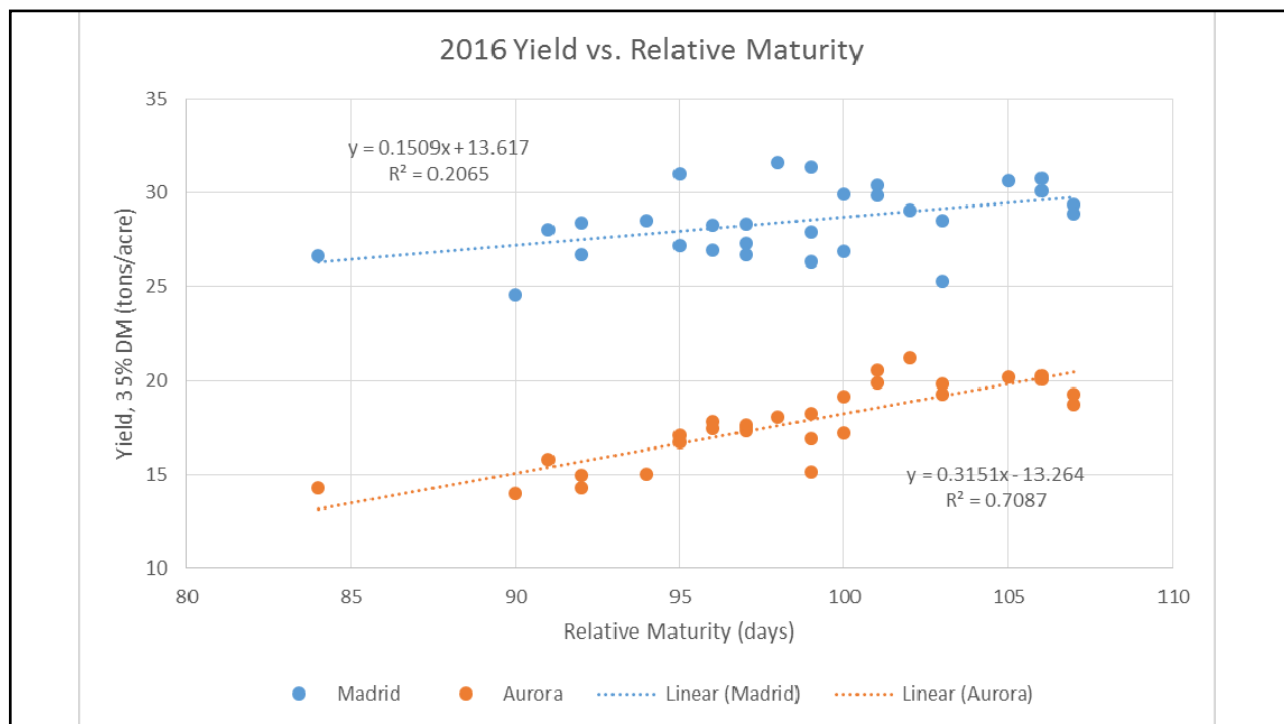
- Row Crop Rotation with no recent manure history

Month	Precipitation (inches)		GDD (86/50 F)	
	Aurora	Madrid	Aurora	Madrid
May	2.00	0.94	303	323
June	0.74	2.37	483	454
July	1.90	2.22	673	627
August	4.56	3.25	713	649
Seasonal	9.20	8.78	2172	2053
10 yr Mean	14.10	14.89	2094	1831

2016 NY Corn Silage Hybrid Trials

	Relative Maturity days	Madrid		Aurora	
		Yield, 35% DM tons/acre	Dry Matter %	Yield, 35% DM tons/acre	Dry Matter %
Relative Maturity Group Mean	84-95	27.6	34.6	15.3	31.4
	96-100	28.3	33.9	17.5	32.4
	101-107	29.3	31.9	19.8	34.5





Grains

Does the system match:

- Herd Needs
- Land Base

Soil Type / Growing Season

- Consistent Production
- Crop Consistently reaches Maturity

Straw

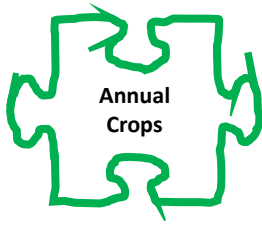
- Use on Farm

Storage

- Evaluate Risk of Loss

Additional Acreage

- Suitable for Grain Crops



Winter Cover Crops

- Soil Health
- Nutrient Management

Double Cropping

- Place in Ration
- Timely Harvest
- Storage Capacity

Does the system match:

- Herd Needs
- Land Base
- Labor Resources

Soil Type / Growing Season

- Establishment of Cover Crops
- Establishment of Crop Following Cover Crop

Summer Annual

- Planned vs. Emergency Forage
- Niche in Crop Rotation
- Place in Ration

Summer & Winter Annual Forages

What are your overall forage needs?

- Where does this feed fit into feeding plan?
 - Class of animals
 - Other ration ingredients
- How many acres are needed to make it useful?
 - Enough to integrate into ration at meaningful level for meaningful length of time
- Where will it be stored.

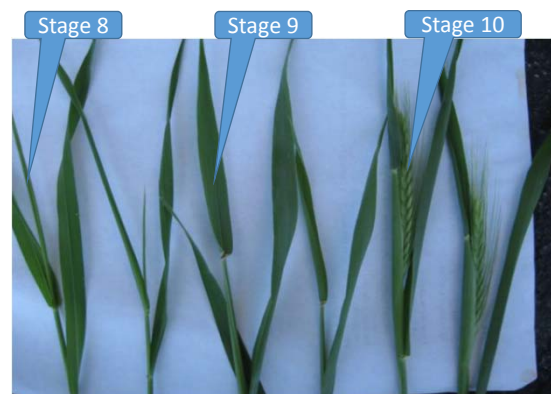
Double Cropping

What do you need most?

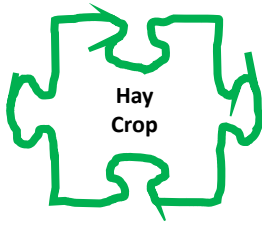
- Total Season Yield
 - In some years double cropping may out-yield single crop
 - In other years total season yield may be equivalent
 - Example
 - Corn Silage 24 tons/acre
 - Winter Grain + Corn Silage 6 tons/acre + 18 tons/acre
- Do you need all the corn silage you can get to meet ration needs or does the small grain haylage meet a need in your feed plan?

Winter Cereal Forage

- N at Spring Greenup
- Target Optimum Quality
 - Flag Leaf Stage (stage 9)
 - Before head emergence!!!!
 - Approx. 1 week before 1st cutting of hay crops
 - Later harvest will only result in modest yield increase with big drop in quality = non-lactating feed
- High Pottassium?



<http://nmsp.cals.cornell.edu/publications/factsheets/factsheet56.pdf>



Does the system match:

- Herd Needs
- Land Base
- Labor Resources

Alfalfa / Grass

- Improved Yield & Quality
- Grass that matches Alfalfa

Grass

- Fiber Digestibility
- Nutrient Management

Alfalfa

- Soil Drainage
- Pest Management

30% Average Grass vs. Pure Average Alfalfa

1/3 to 2/3 more tons/a of dry matter per season

6-7% units higher NDFD in mixture

CP near 20%, (vs. 20%+)

Meadow fescue **1-2%** units higher NDFD in mix (30%)

HQ Alfalfa **1-2%** units higher NDFD in mix (70%)

30% MF/HQ Alfalfa (vs. pure alfalfa) may be:

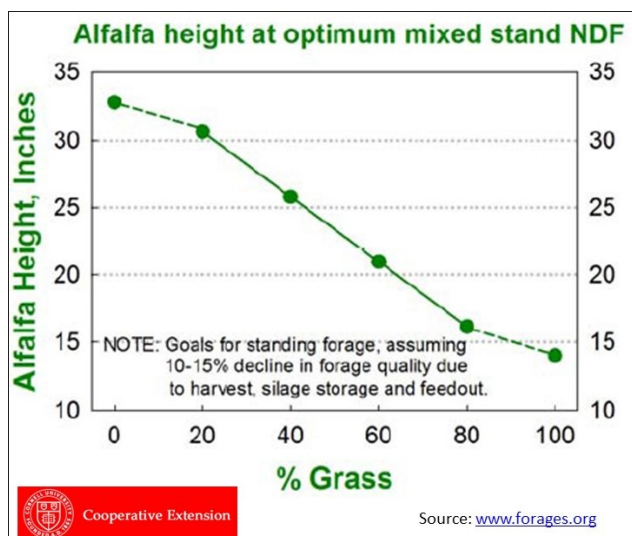
1/3 to 2/3 more tons/acre and

8-11% units higher NDFD

OR about 20% higher NDFD in mixture

Slide Credit:
Jerry Cherney, Cornell

Harvesting Mixed Stands



First Cut Forage Quality vs. Yield

Alfalfa

Daily alfalfa forage change in yield and quality during the growing season			
Cutting	Yield (lb/day)	RFV per day	RFQ per day
-----Daily Change-----			
1	100	-5	-5
2	100	-2 to -3	-5
3	100	-2	-4
4	100	-1	-4

Undersander, Wisconsin

Grass

- Yield gain: ~150 lbs DM/a/day*
- NDFd decline: 1%/day
- Alfalfa/grass mix: falls in between
- Feeding trials: cows drop 0.5-1.0 lbs/cow/day with each 1% drop in NDFd

*leading up to maturity;
when crop reaches maturity DM increase/day slows way down

Cherney, Cornell

For 100 acres: ~5-7 ton DM/day during vegetative growth

Grasses

Potential for very good feed on land not as well suited for other crops.

- Nitrogen for yield and protein.

Pure Grass – Select early heading variety

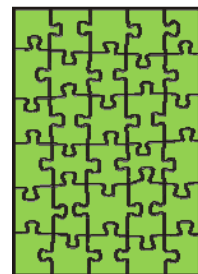
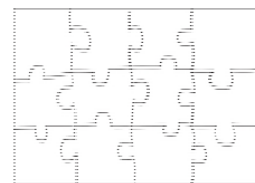
Early heading cultivars/species can be 10% units higher in NDFD at heading compared to late heading cultivars/species at heading.

- Jerry Cherney, Cornell

- Are you equip to harvest early and often?
- Can you get on ground in the spring?

Each Puzzle is Unique

- Analyzing your resources & how they fit your goals.
- Ability to adapt to align your business with your resources and goals.
- Develop a Plan and stick with it.
 - Too much on the line to “fly by the seat of your pants”



Thank You!



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