AMT Manure Applications

Tom Butler, EPA

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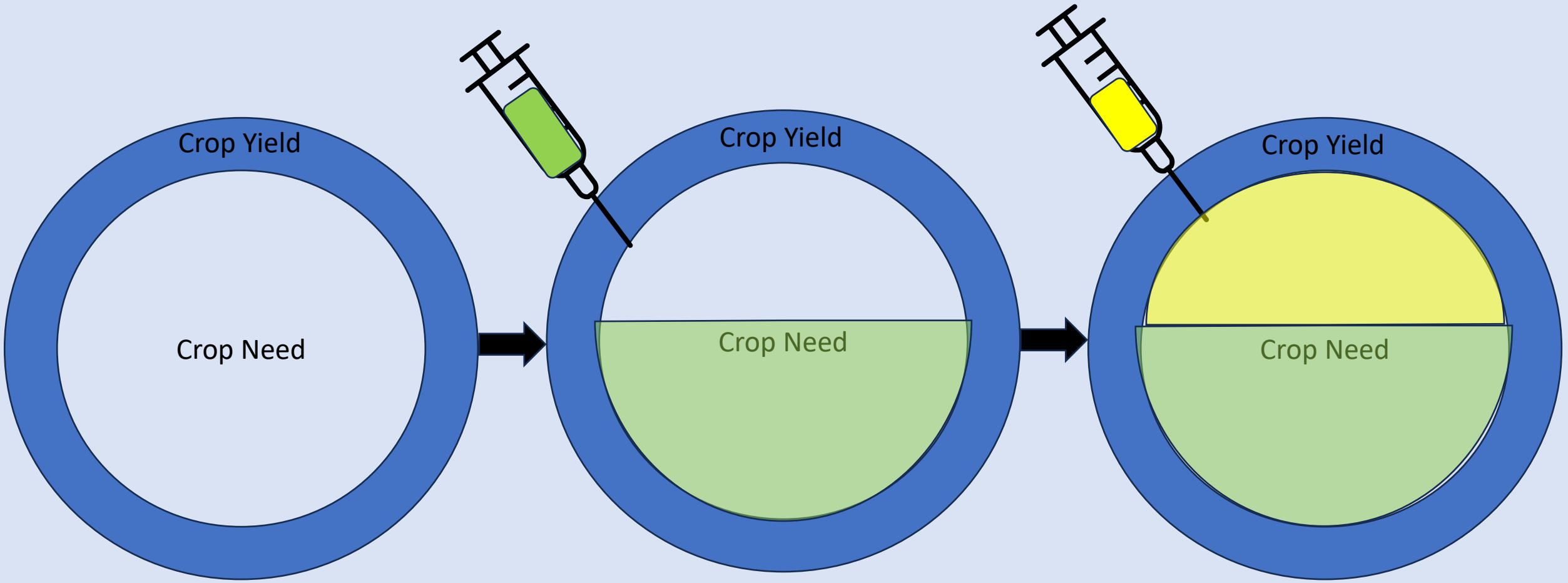
Goal

Improve the realism of manure applications to different Land Uses

Let’s recap how applications work:



Find an observed yield (NASS) and calculate the nutrients used to grow that yield (crop need)

Organic nutrients are applied

Inorganic nutrients are applied

Let’s recap how applications work:

Group 1

- Grain with manure
- Silage
- Small Grains
- Double cropped
- Other crops
- Specialty (high and low)

Group 2

- Other Hay
- Pasture

Group 3

- Soybeans
- Legume Hay

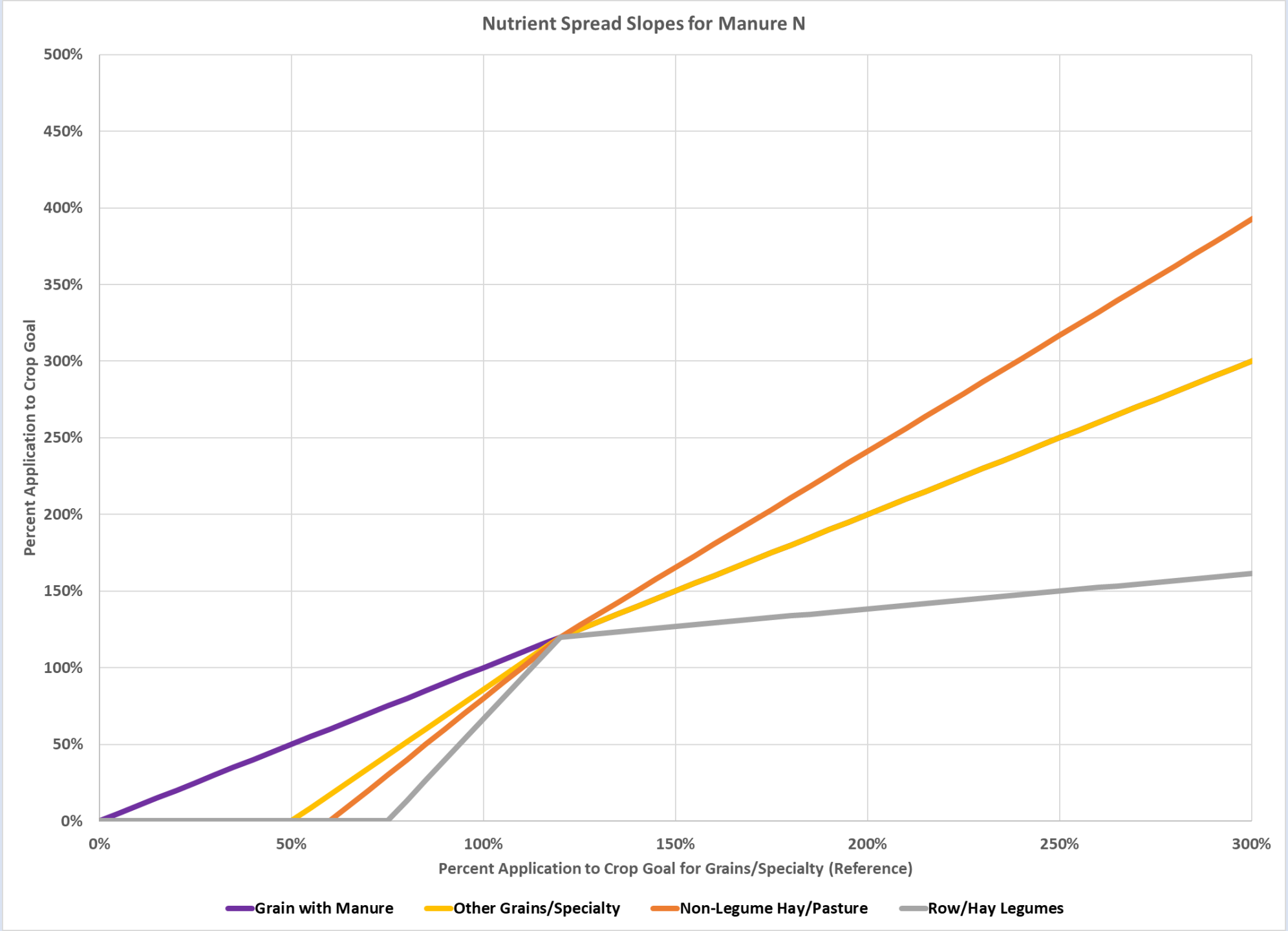
How can we go about solving this?

Split Group 1 (the original idea)

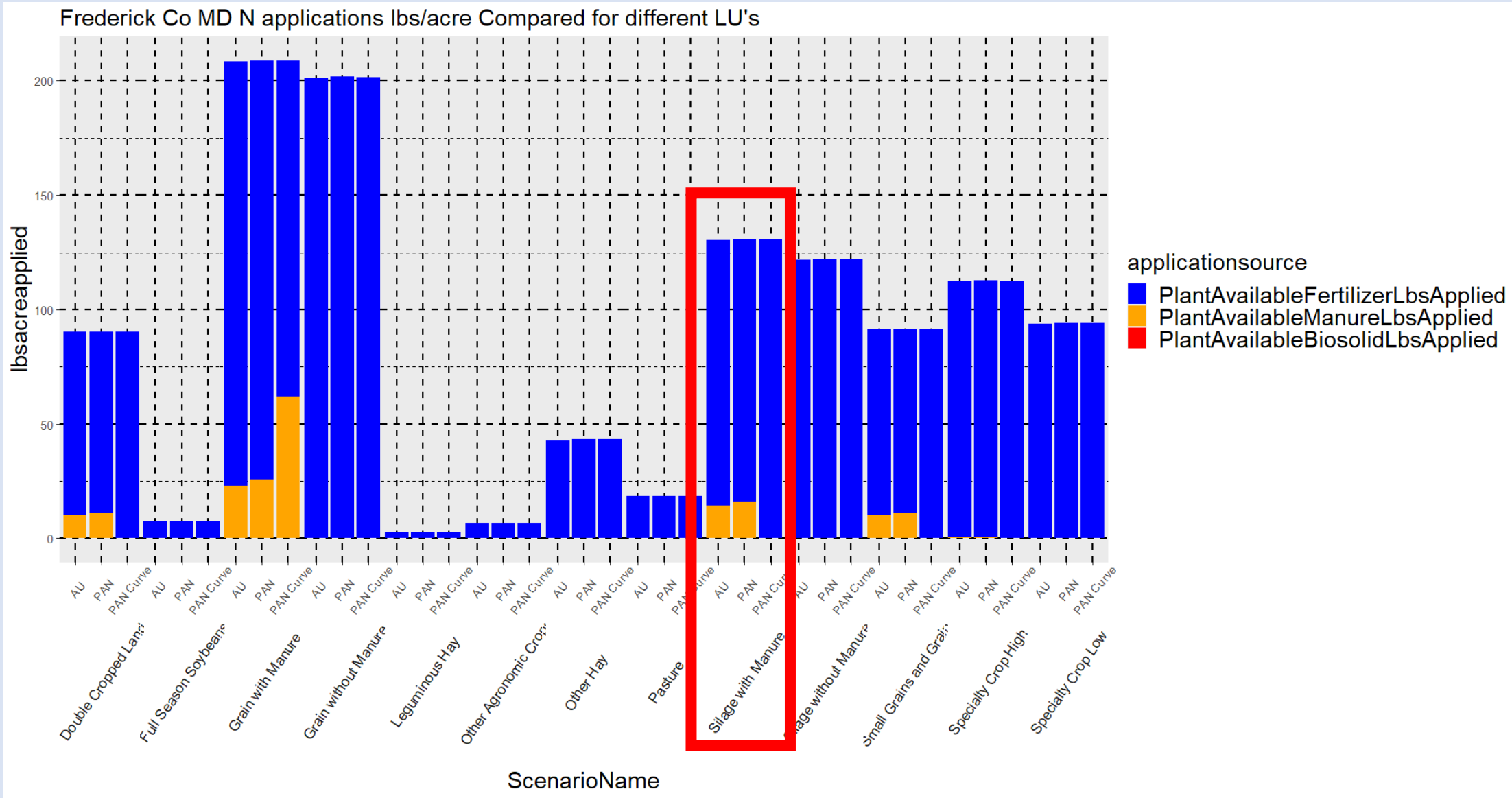
- Grains with manure is its own group
- Receives manure nutrients exclusively until it meets 50% of crop need

Let’s recap how applications work:

Group 1	Group 2	Group 3	Group 4
• Grain with manure	• Silage • Small Grains • Double cropped • Other crops • Specialty (high and low)	• Other Hay • Pasture	• Soybeans • Legume Hay


Nutrient Spread Slopes for Manure N
500%
450%
400%
350%
300%
250%
200%
150%
100%
50%
0%
Percent Application to Crop Goal
0%
50%
100%
150%
200%
250%
300%
Percent Application to Crop Goal for Grains/Specialty (Reference)
Grain with Manure
Other Grains/Specialty
Non-Legume Hay/Pasture
Row/Hay Legumes

This didn’t quite solve the problem



Take two!

Split Group 1

- Grains with manure AND silage are their own group
- Receives manure nutrients exclusively until it meets 50% of crop need

Let’s recap how applications work:

Group 1

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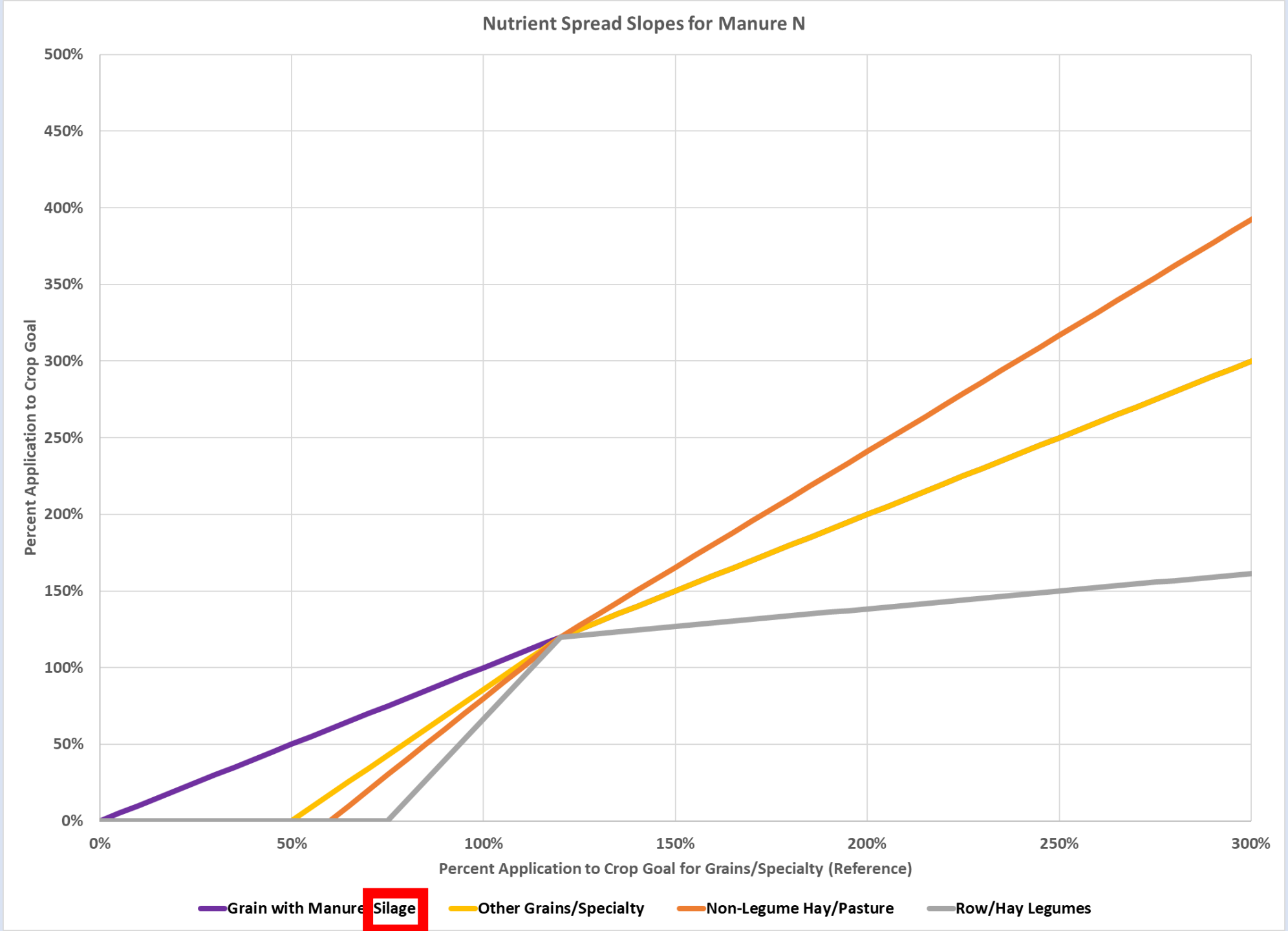
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Percent Application to Crop Goal for Grains/Specialty (Reference)
Grain with Manure Silage
Other Grains/Specialty
Non-Legume Hay/Pasture
Row/Hay Legumes

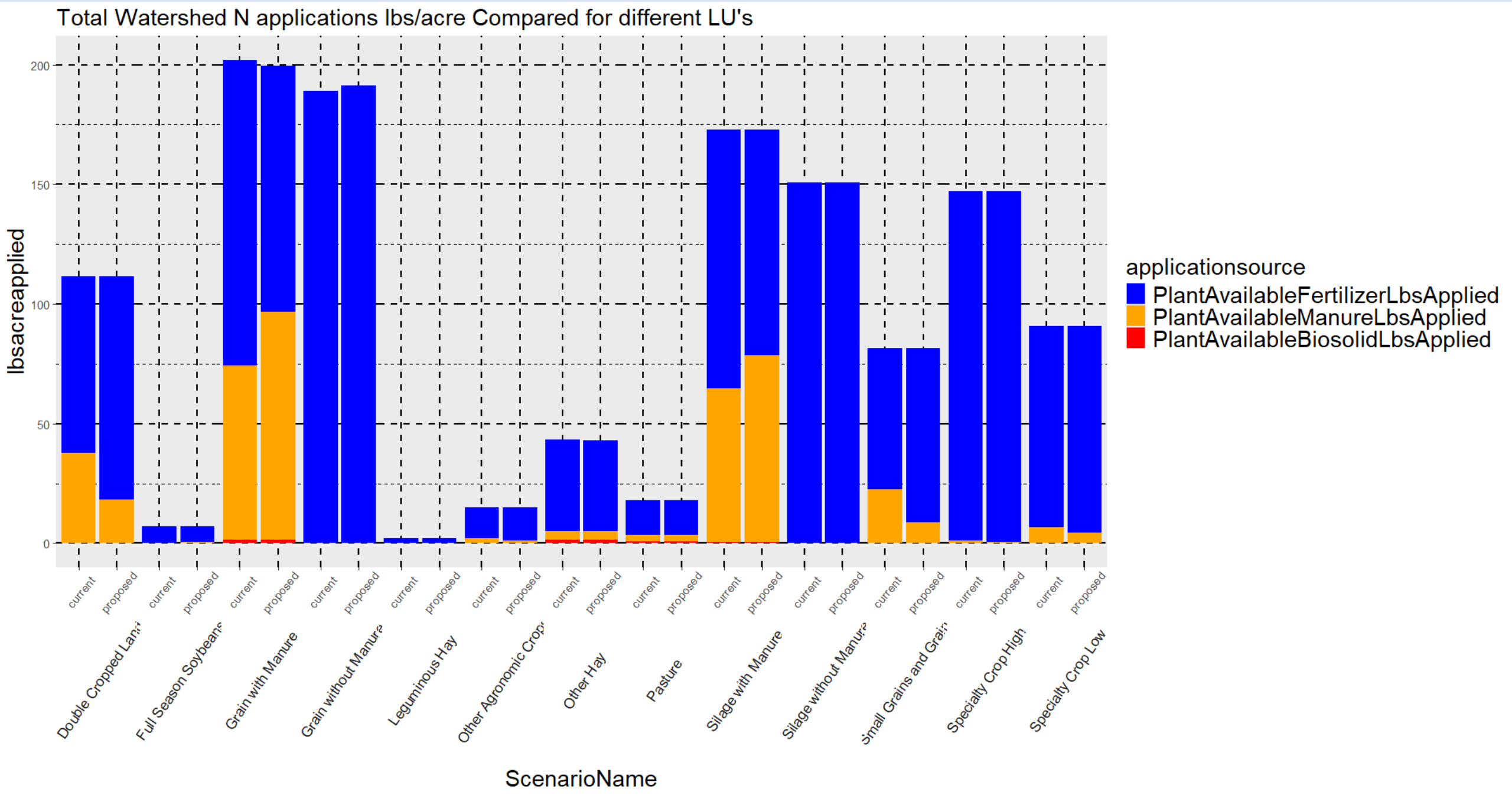
Let's walk through some results:

Current – The current Phase 6 CAST method

- Using AU's to determine grain with manure acres
- Combine grain with manure and silage with other Land Uses during application

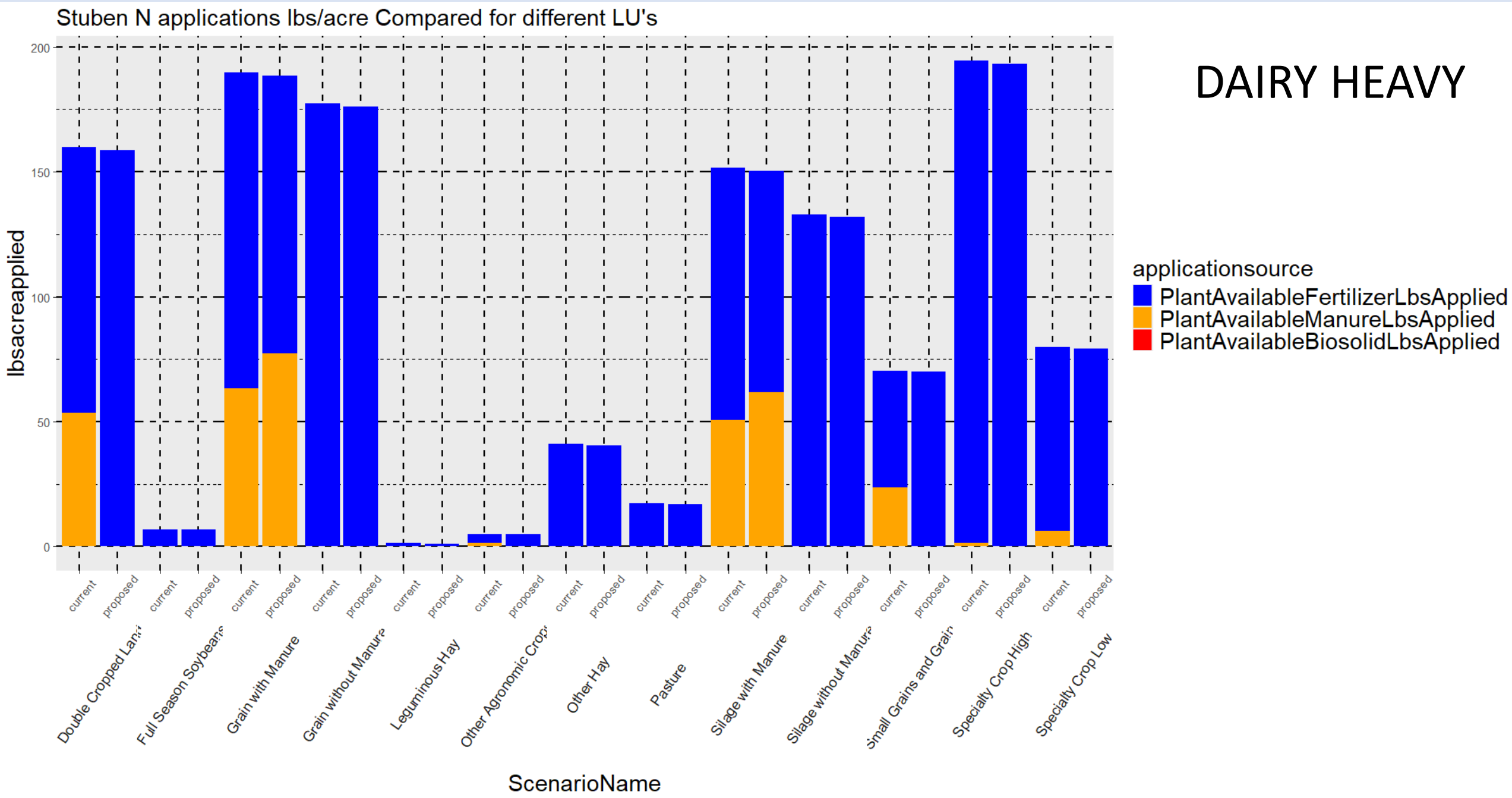
Proposed – Proposed updated Phase 7 method

- Utilizing Plant Available Nitrogen to determine grain with manure acres
  - June AMT
- Separates grain with manure and silage into single application category


Total Watershed N applications lbs/acre Compared for different LU's
lbsacreapplied
200
150
100
50
0
current
proposed
Double Cropped Land
Full Season Soybeans
Grain with Manure
Grain without Manure
Leguminous Hay
Other Agronomic Crop
Other Hay
Pasture
Silage with Manure
Silage without Manure
Small Grains and Grain
Specialty Crop High
Specialty Crop Low
ScenarioName
applicationsource
PlantAvailableFertilizerLbsApplied
PlantAvailableManureLbsApplied
PlantAvailableBiosolidLbsApplied

What about a few counties?

	POULTRY HEAVY*	DAIRY HEAVY**		
Animal	Northumberland* Animal Units	Steuben** Animal Units	Northumberland* Stored PAN Lbs	Steuben** Stored PAN Lbs
dairy	5,820	28,608	166,795	880,136
layers	3,747	4,301	379,718	435,831
beef	2,133	8,191	14,768	111,974
broilers	27,785	2	252,542	23
goats	36	31	363	310
hogs and pigs for breeding	1,504	121	62,573	5,035
hogs for slaughter	9,216	4,749	101,947	52,539
horses	1,368	4,499	2,059	10,995
other cattle	4,710	13,409	38,187	339,599
pullets	270	329	24,439	29,717
sheep and lambs	136	351	978	2,528
turkeys	8,664	4	86,257	39
Total Value:	65,389	64,595	1,130,626	1,868,726


Stuben N applications lbs/acre Compared for different LU's
lbsacreapplied
200
150
100
50
0
current
proposed
Double Cropped Land
Full Season Soybeans
Grain with Manure
Grain without Manure
Leguminous Hay
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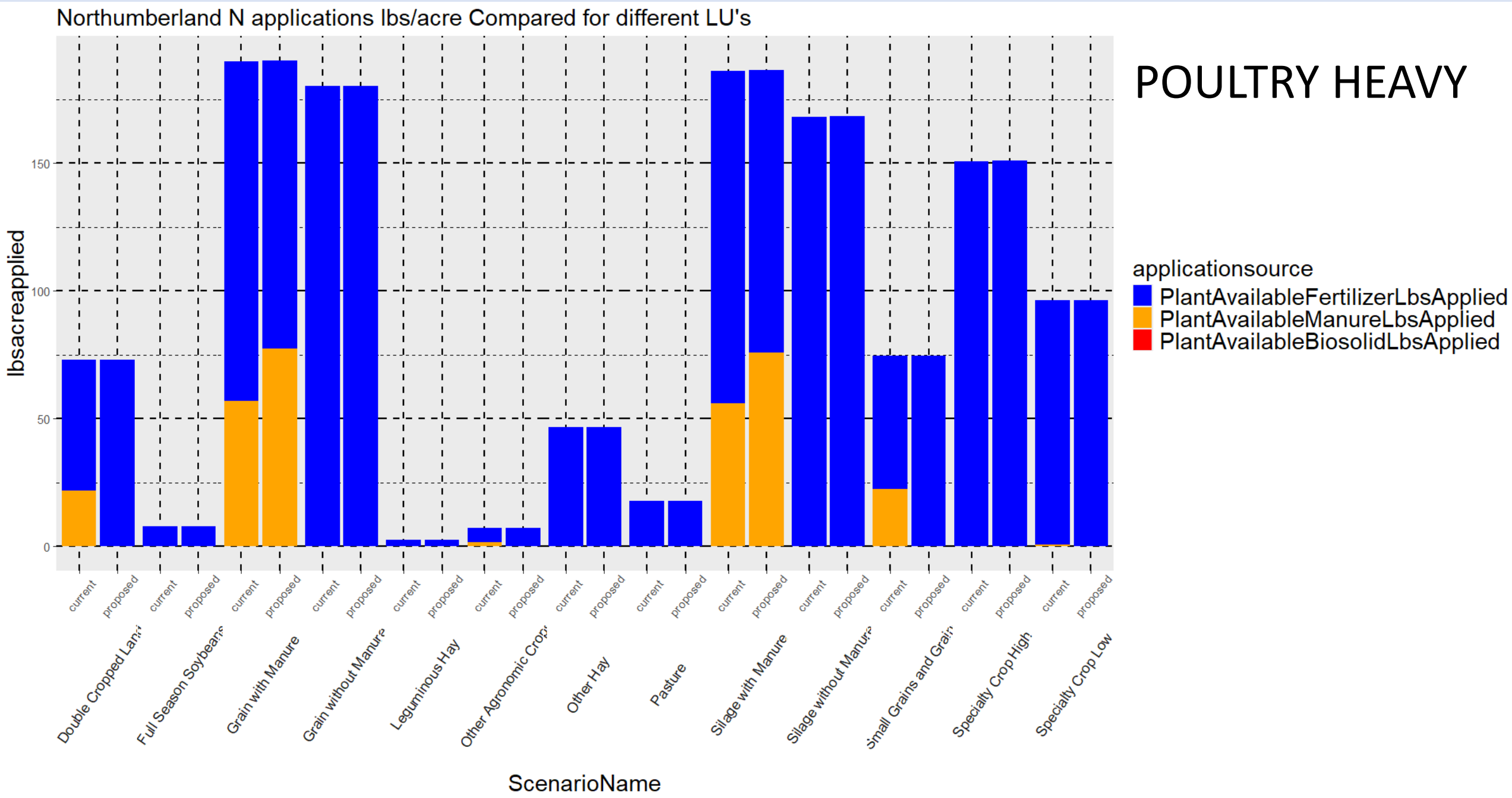
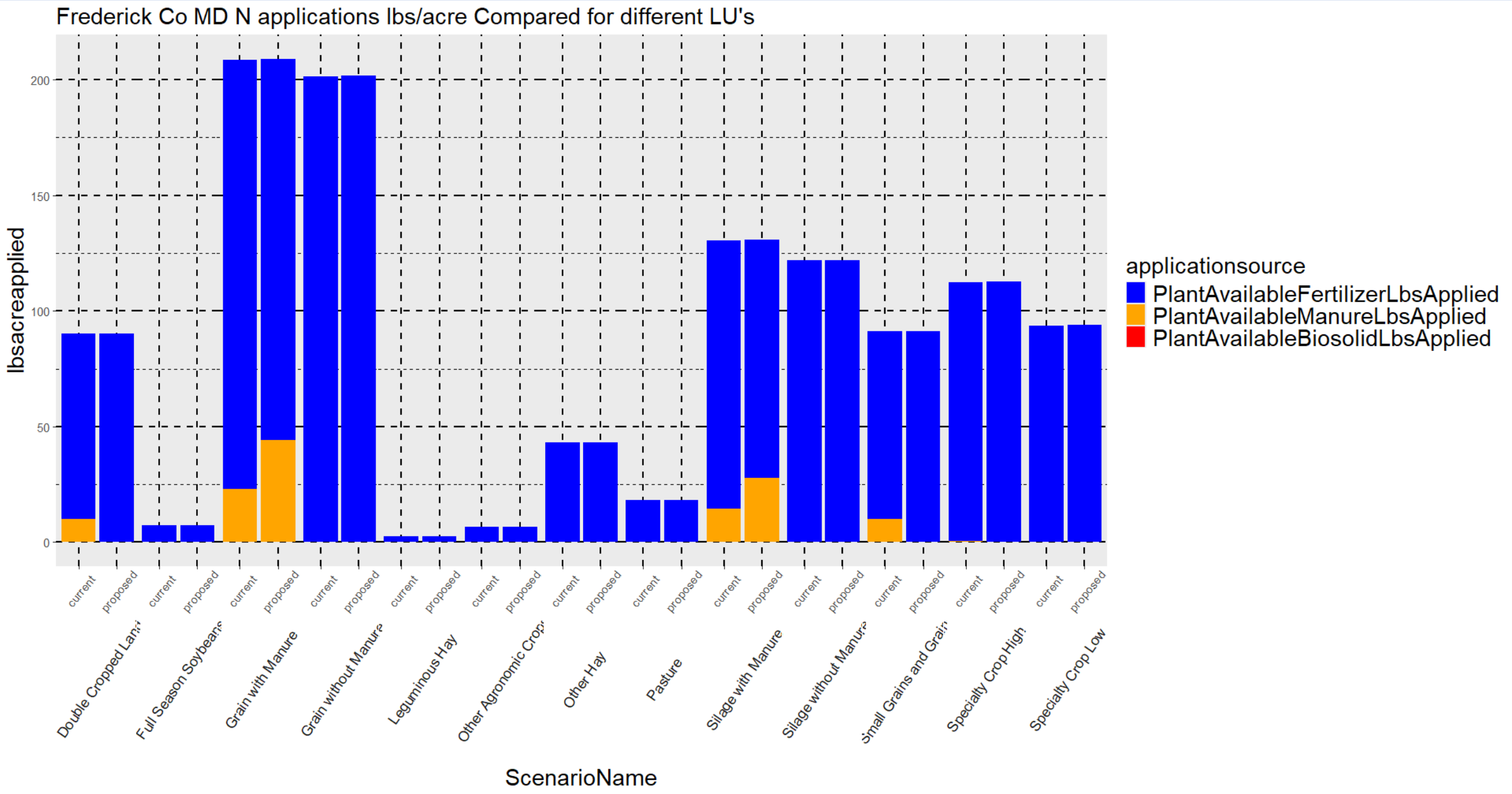
DAIRY HEAVY



POULTRY HEAVY

One more look:

- Frederick County, MD
  - All manure to grains and silage with manure
  - No manure to other Land Uses


Frederick Co MD N applications lbs/acre Compared for different LU's
lbsacreapplied
200
150
100
50
0
current
proposed
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PlantAvailableFertilizerLbsApplied
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PlantAvailableBiosolidLbsApplied

Summary

- The current application process leads to low manure application over large areas
- By separating grains and silage with manure into their own application category higher applications are made over fewer acres
- This has variations across counties

Questions?

Pulse check

- Is this an improvement?