AMT Manure Applications

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7/12/2024

recap

May 2024

- Land Uses

June 2024

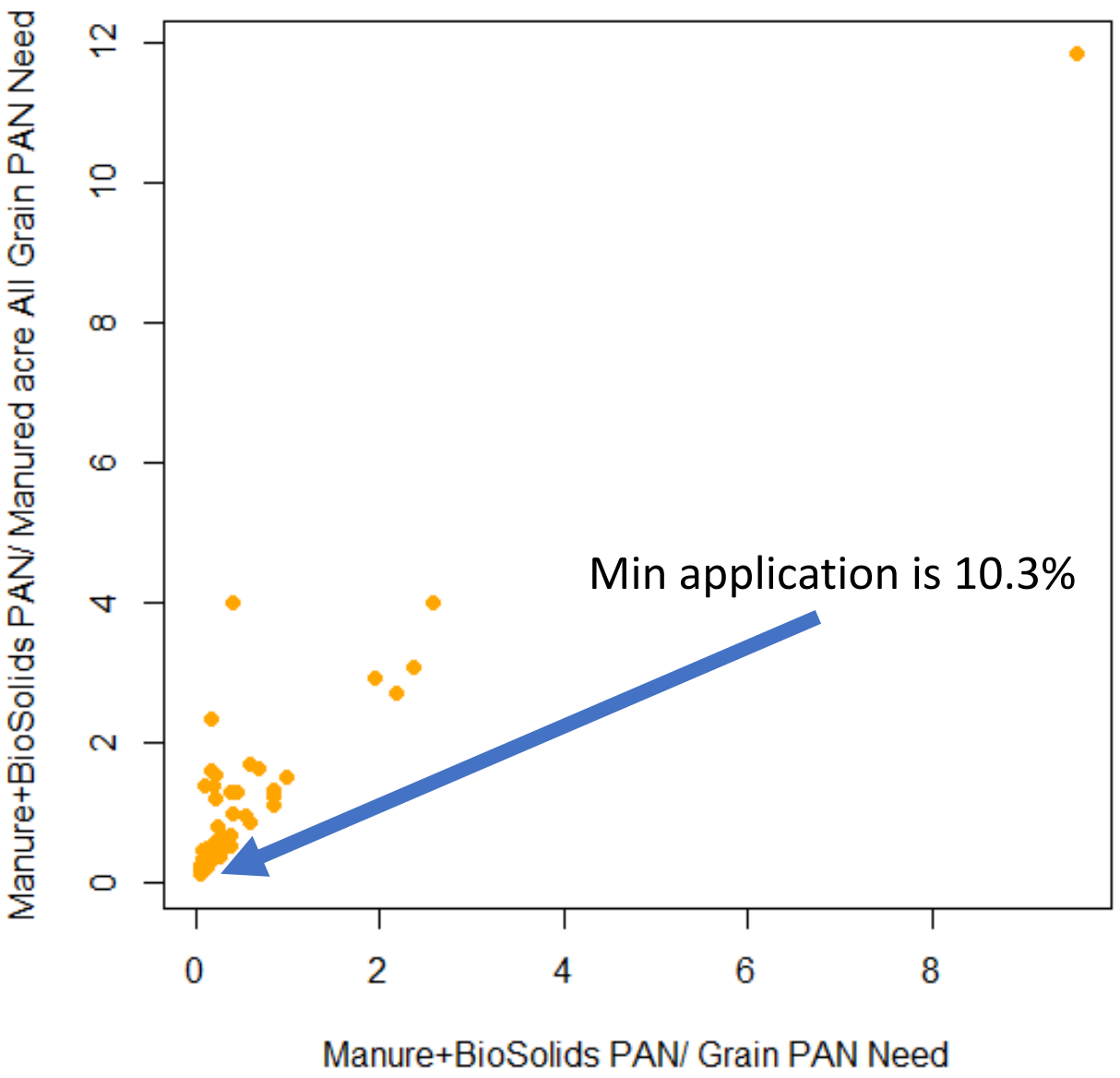
- Determine acres of grain with manure using Plant Available Nitrogen

July 2024

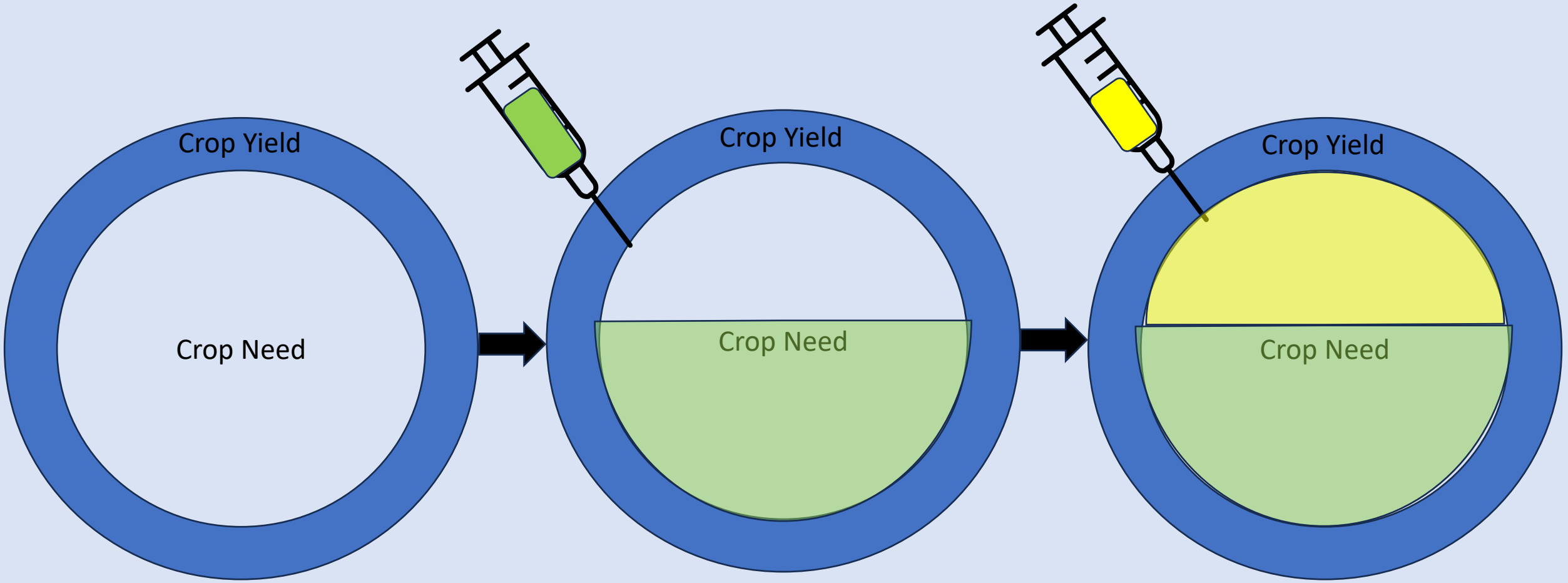
- Still concerns about manure land uses

Framing concerns

- Land uses which are eligible to receive manure are not behaving realistically
  - Small quantities spread over larger areas



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

Group 2

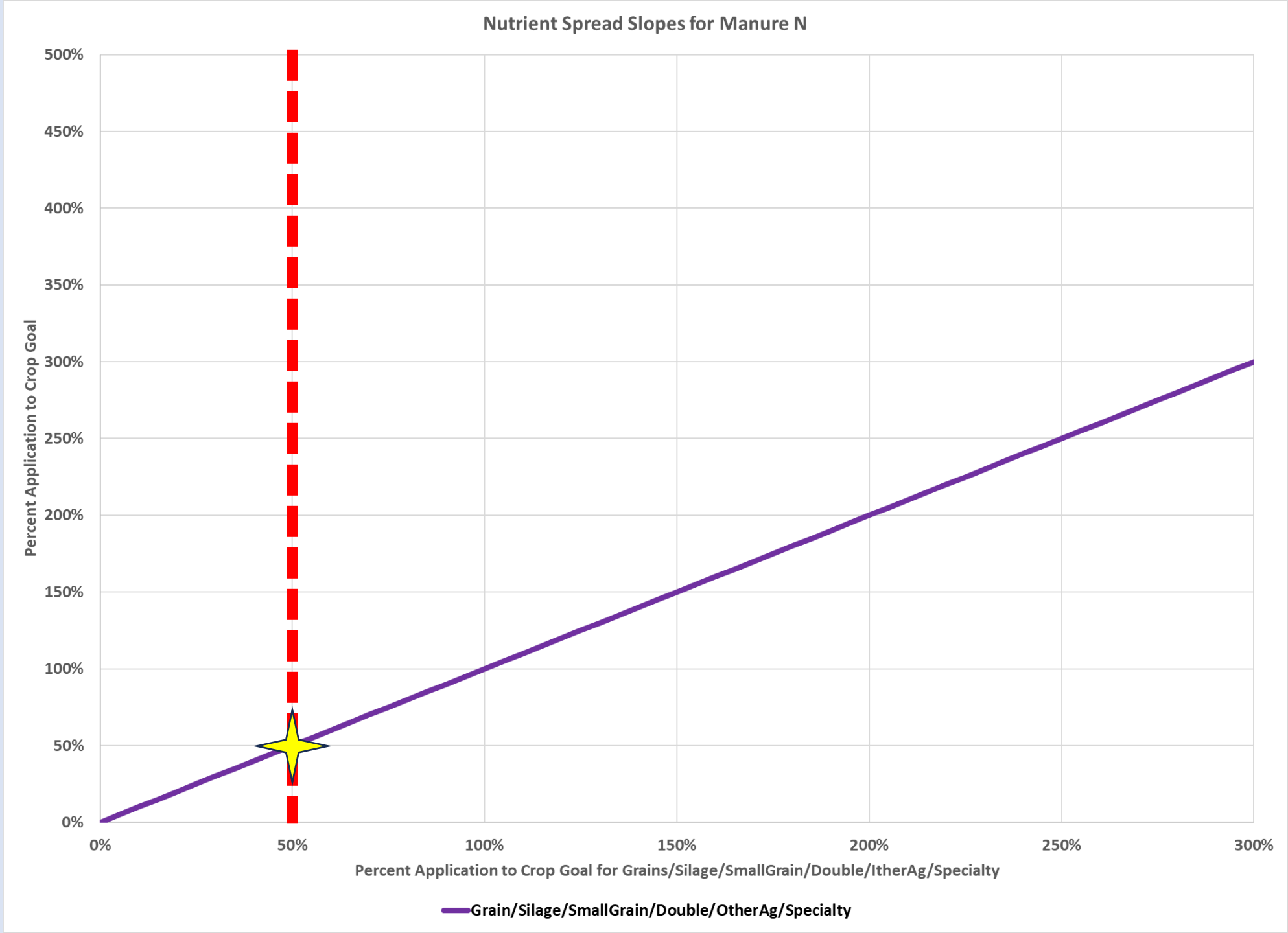
- Other Hay
- Pasture

Group 3

- Soybeans
- Legume Hay

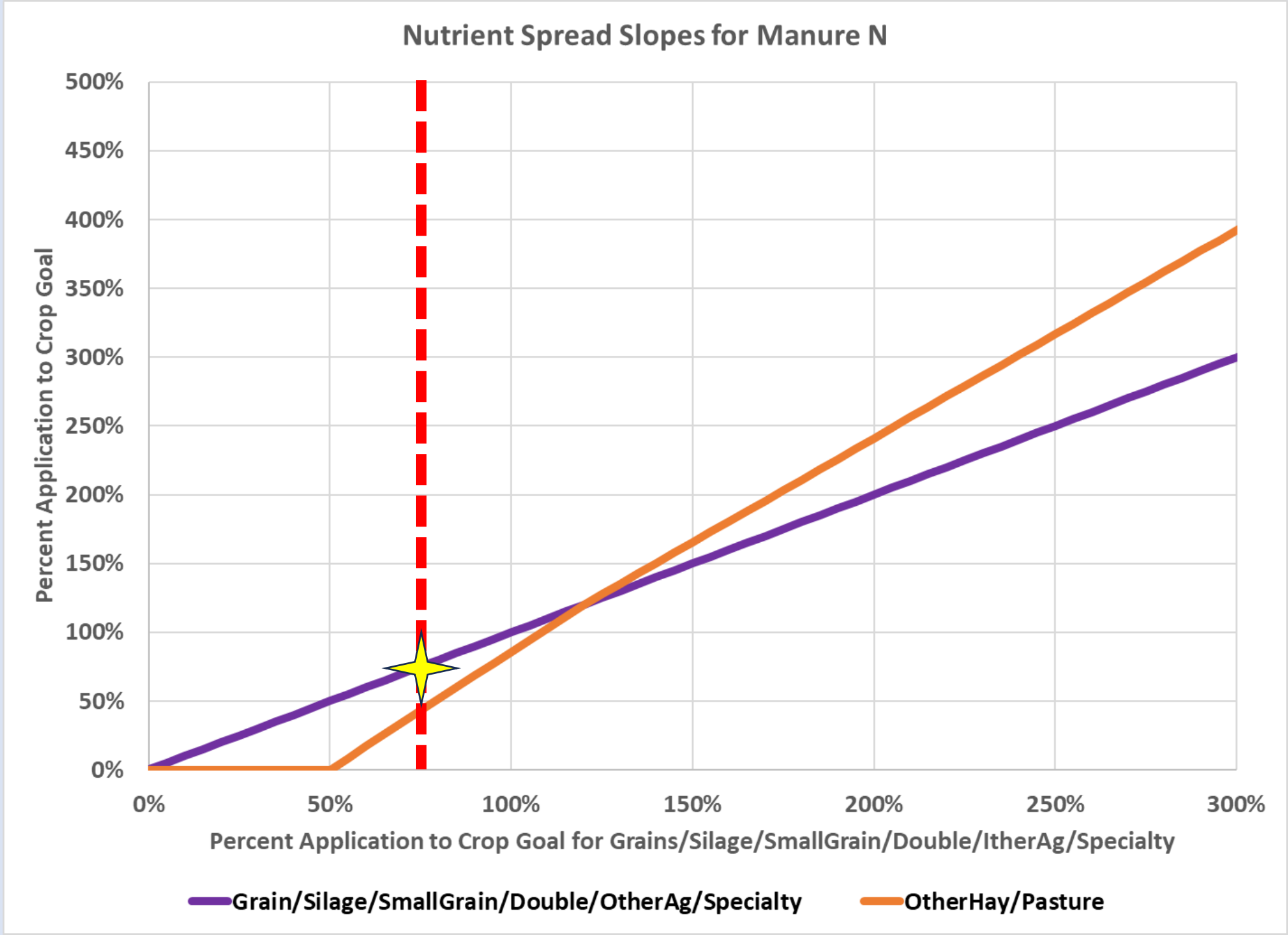
Group 1

- Start with:
  - Grain
  - Silage
  - Small Grains
  - Double cropped
  - Other crops
  - Specialty (high and low)
- Go until each of these crops has 50% of its need met.



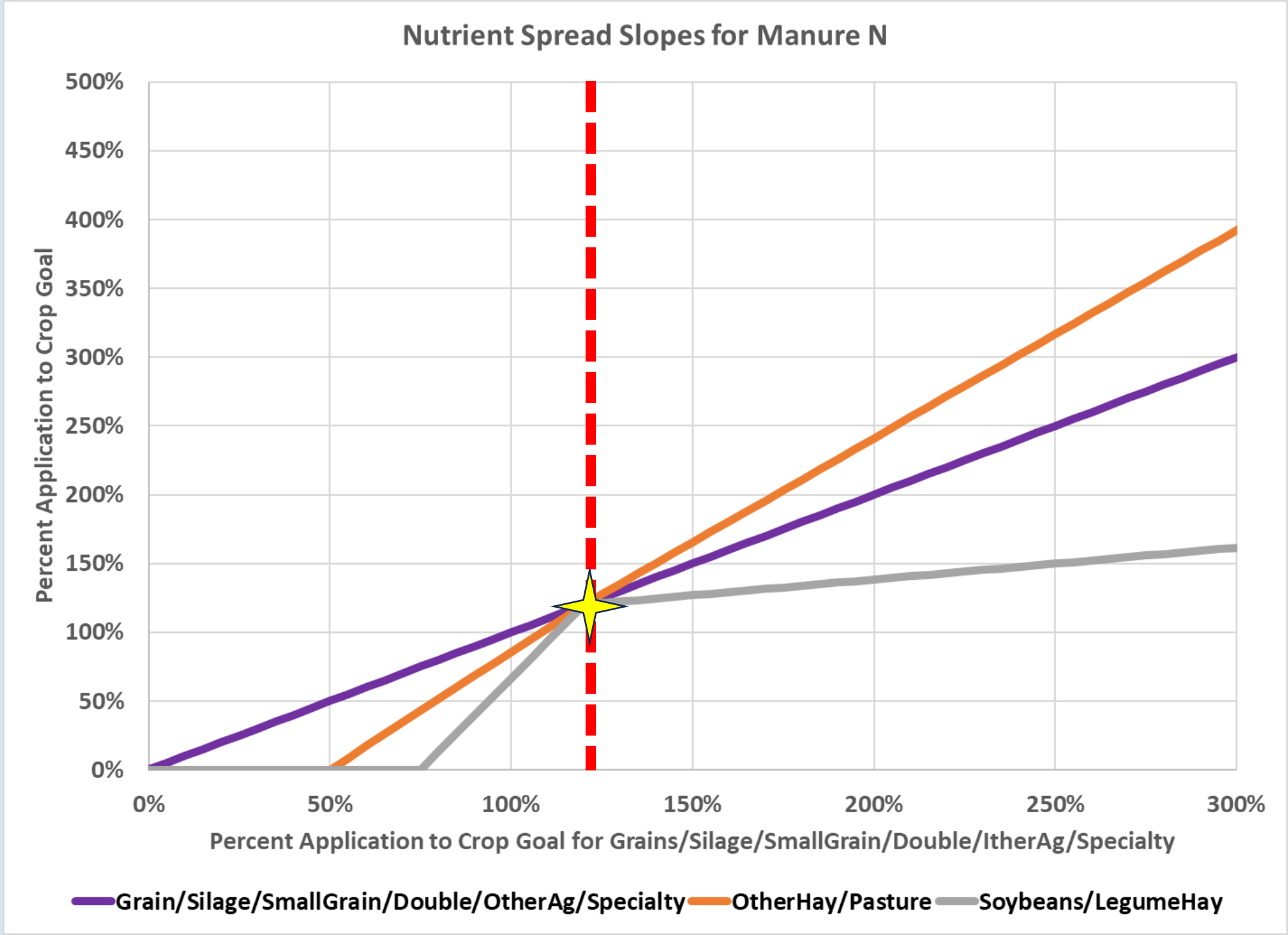
Group 2

- We will KEEP applying to Group 1
- Begin applying to:
  - Other Hay
  - Pasture
- Go until we hit 75% of crop need for Group 1



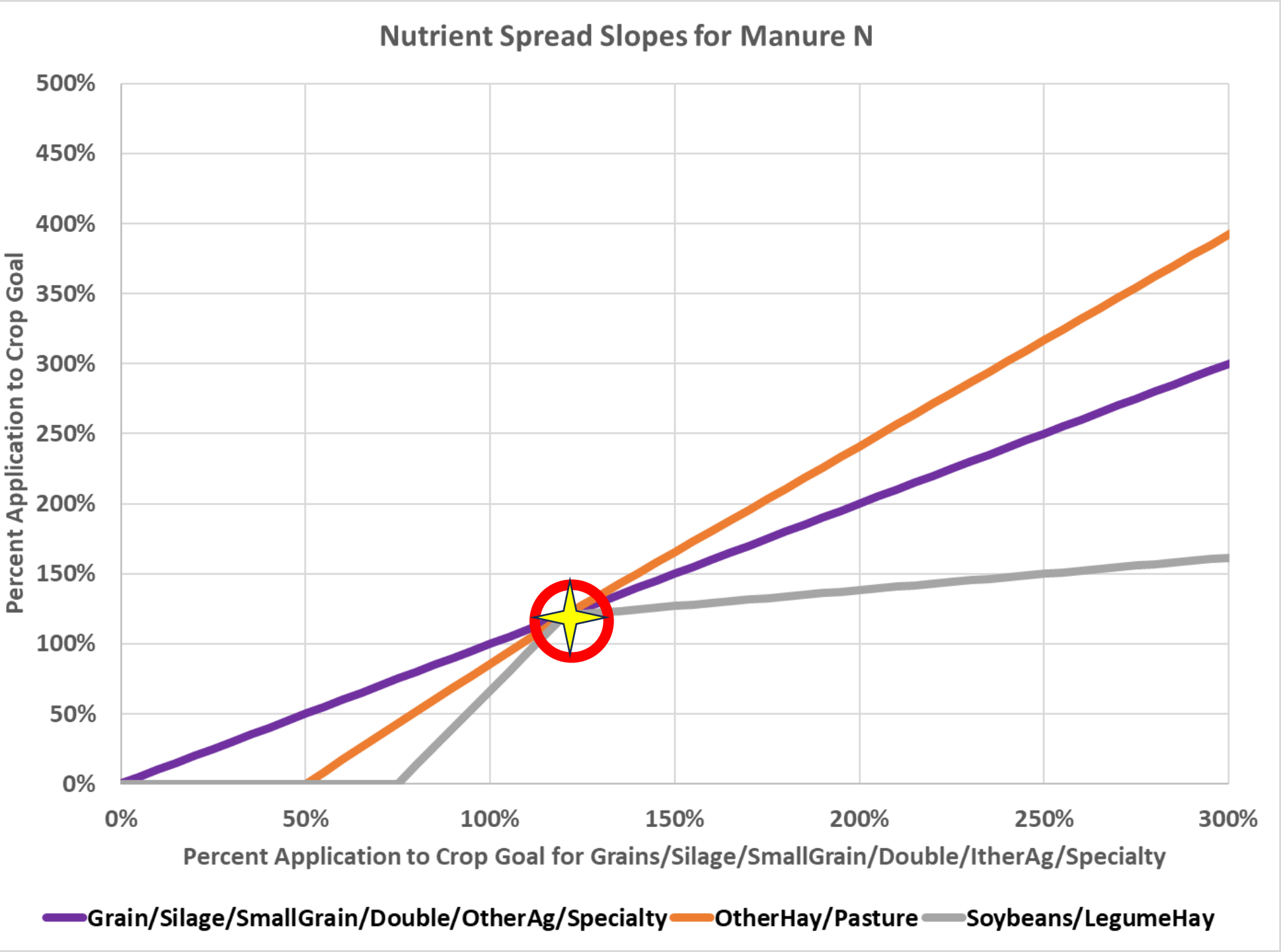
Group 3

- We will KEEP applying to Groups 1 AND 2
- Begin applying to:
  - Soybeans
  - Legume Hay



NOTES:

- 120% of crop need is the assumed max for nutrient application
- It is rare to get close to 120% with manure alone
- Volatilization occurs on the field



Why would applications be “spread thin”?

Group 1

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

Group 2

- Other Hay
- Pasture

Group 3

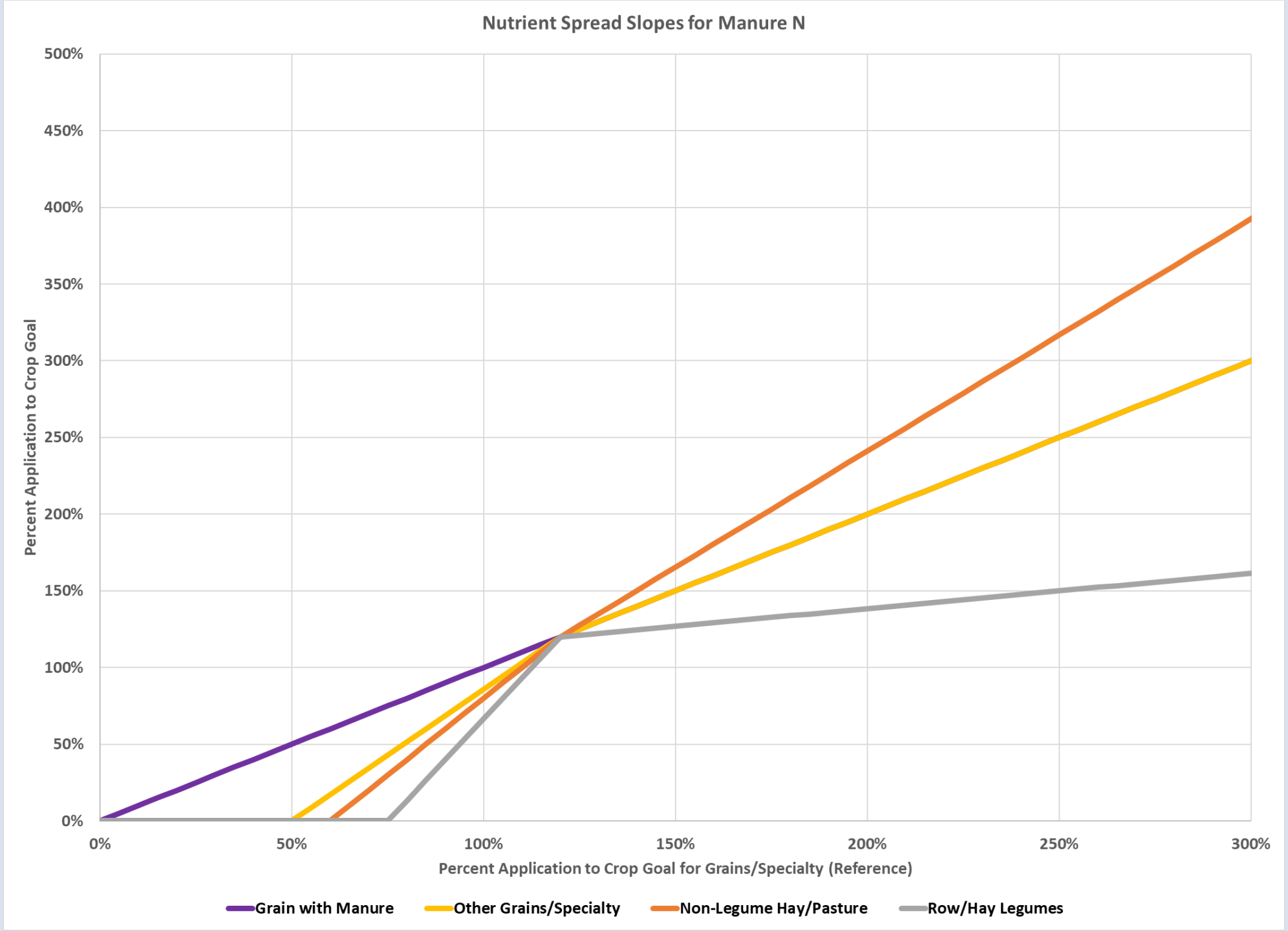
- Soybeans
- Legume Hay

- A larger number of acres pulls from a limited pool of manure
- Creates a low manure application rate to many acres
- There should be more manure utilized per acre then what CAST currently has

How can we go about solving this?

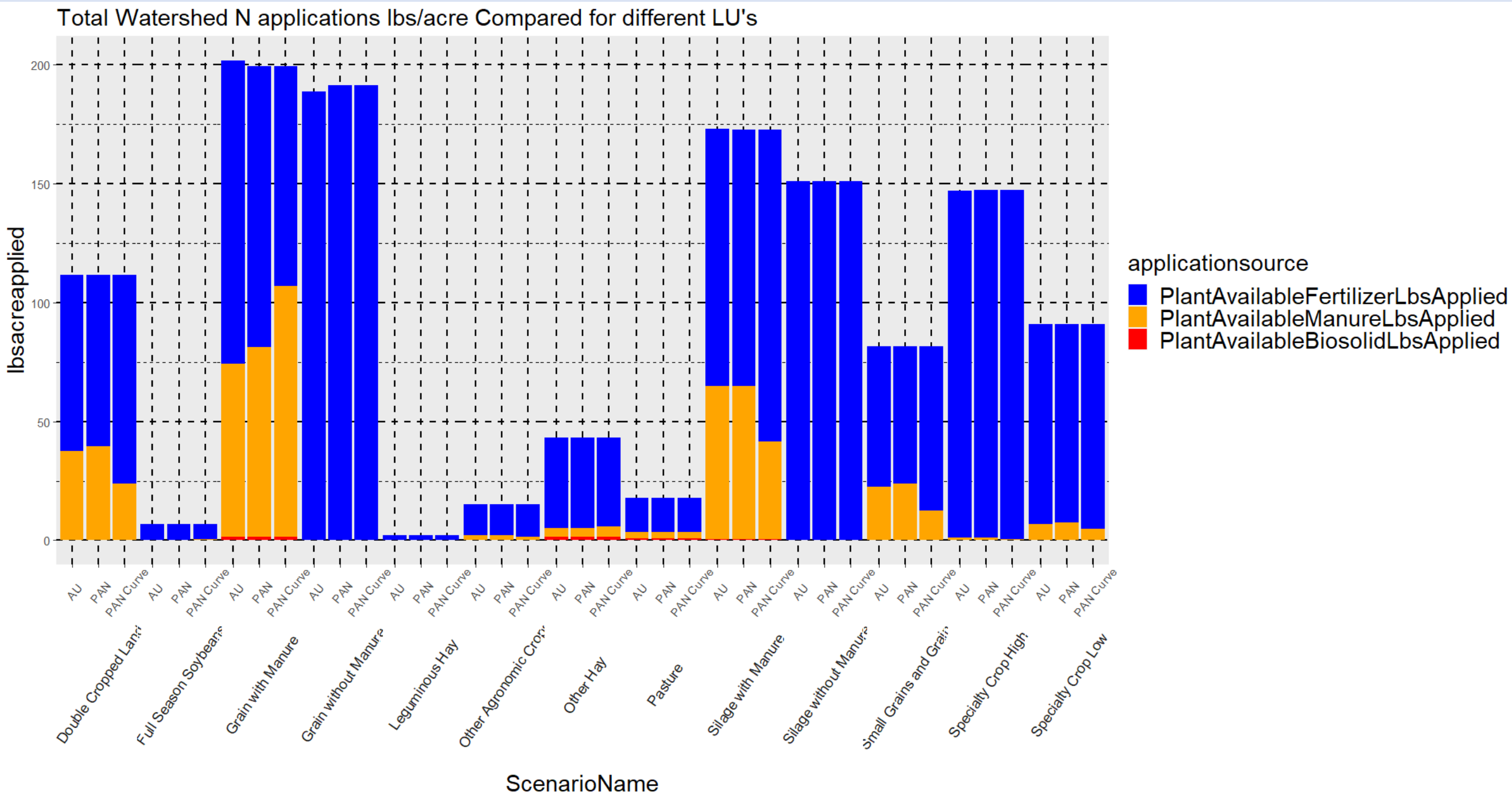
Split Group 1

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


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

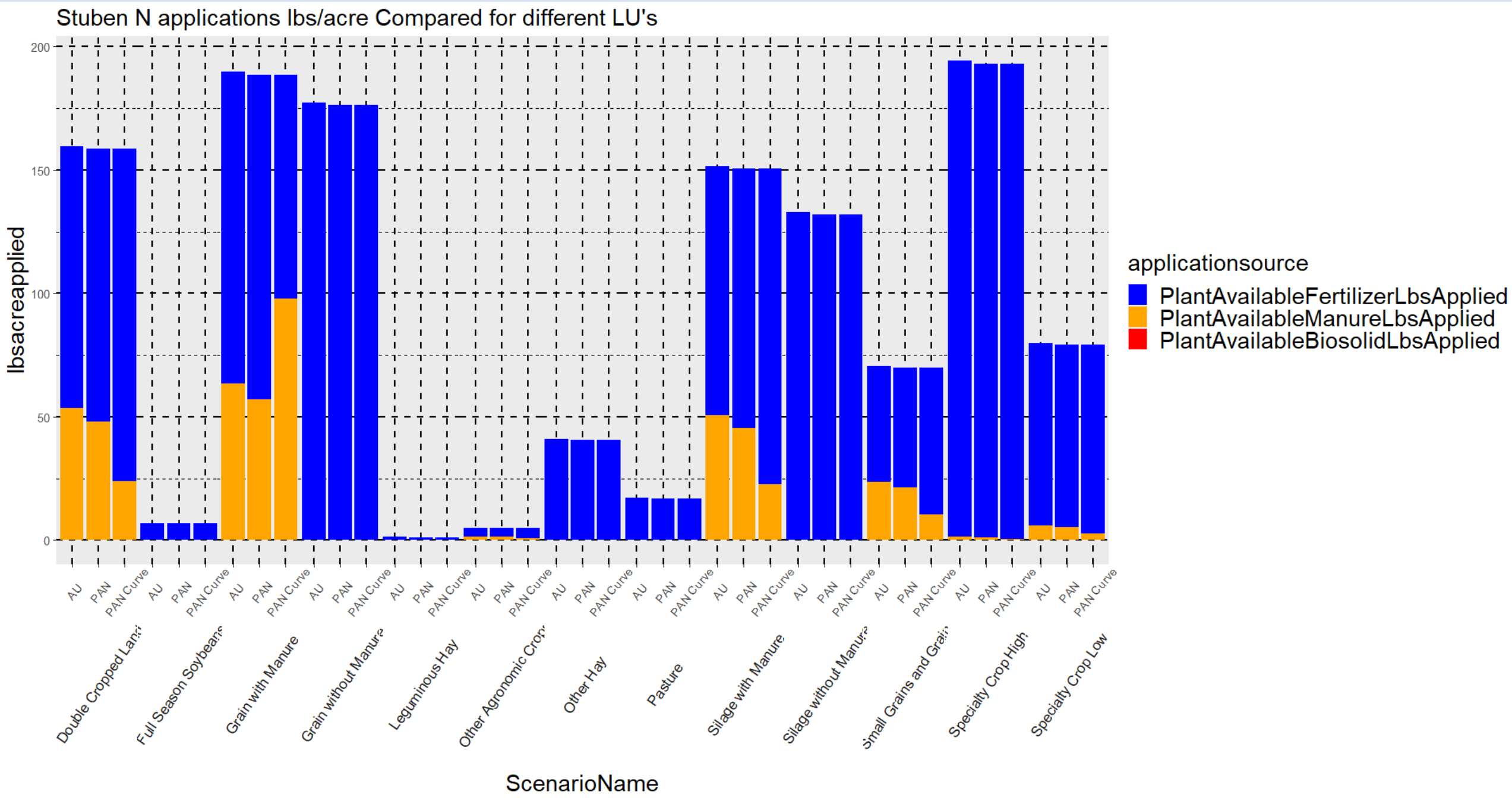
What does this do to applications?

- Shifts fertilizer in multiple Land Uses
- Example scenarios
  - ***AU*** – The current Phase 6 CAST method using AU's to determine grain with manure acres
  - ***PAN*** – Utilizing Plant Available Nitrogen to determine grain with manure acres (June AMT)
  - ***PAN Curve*** – Utilize Plant Available Nitrogen to determine grain with manure acres AND creates a new application curve.


Total Watershed N applications lbs/acre Compared for different LU's
lbsacreapplied
200
150
100
50
0
AU
PAN
PAN Curve
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?

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
AU
PAN
PAN Curve
Double Cropped Land
Full Season Soybeans
Grain with Manure
Grain without Manure
Leguminous Hay
Other Agronomic Crop
Other Hay
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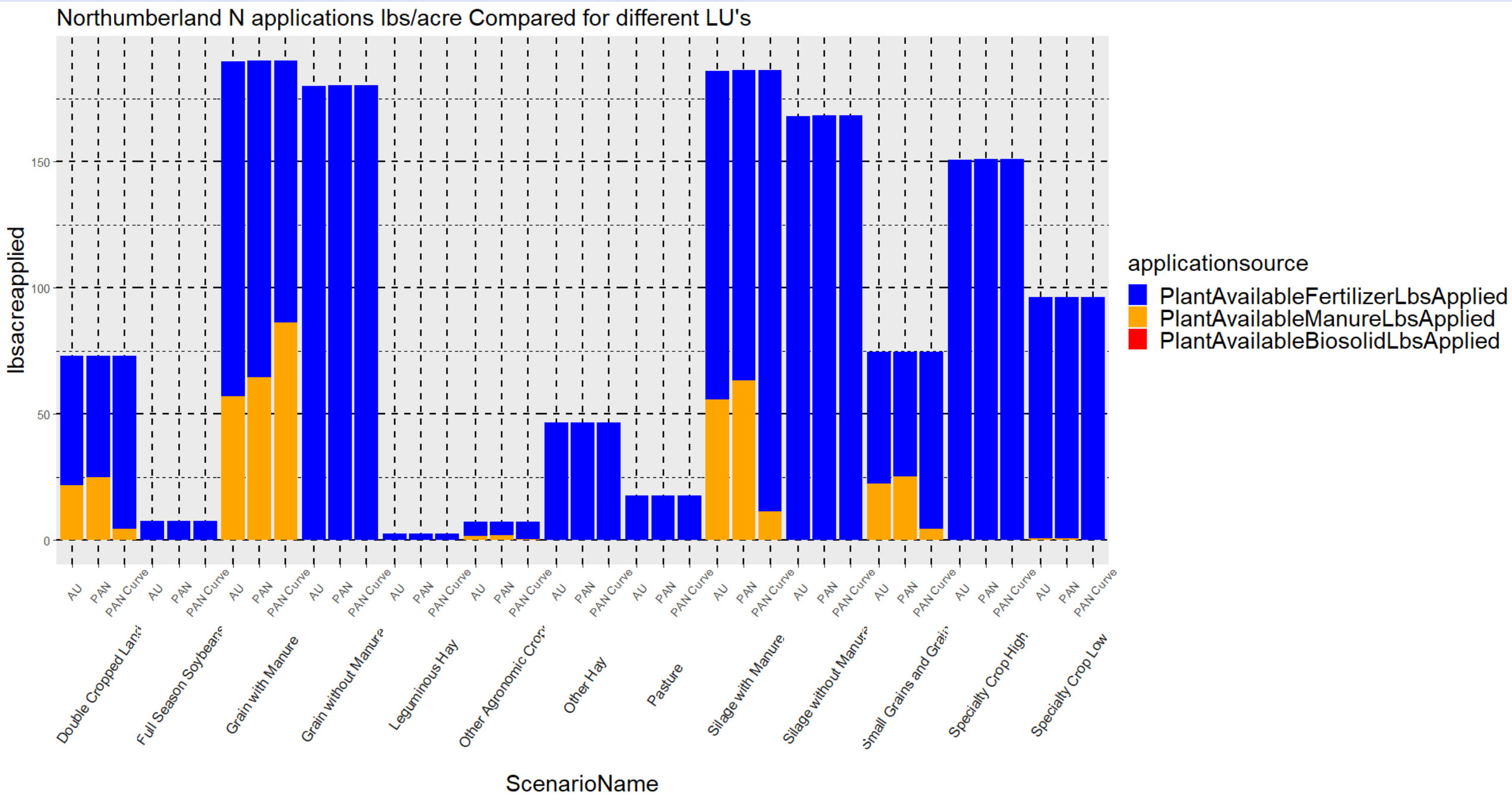
Northumberland N applications lbs/acre Compared for different LU's
lbsacreapplied
150
100
50
0
AU
PAN
PAN Curve
Double Cropped Land
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Grain with Manure
Grain without Manure
Leguminous Hay
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Silage with Manure
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Specialty Crop High
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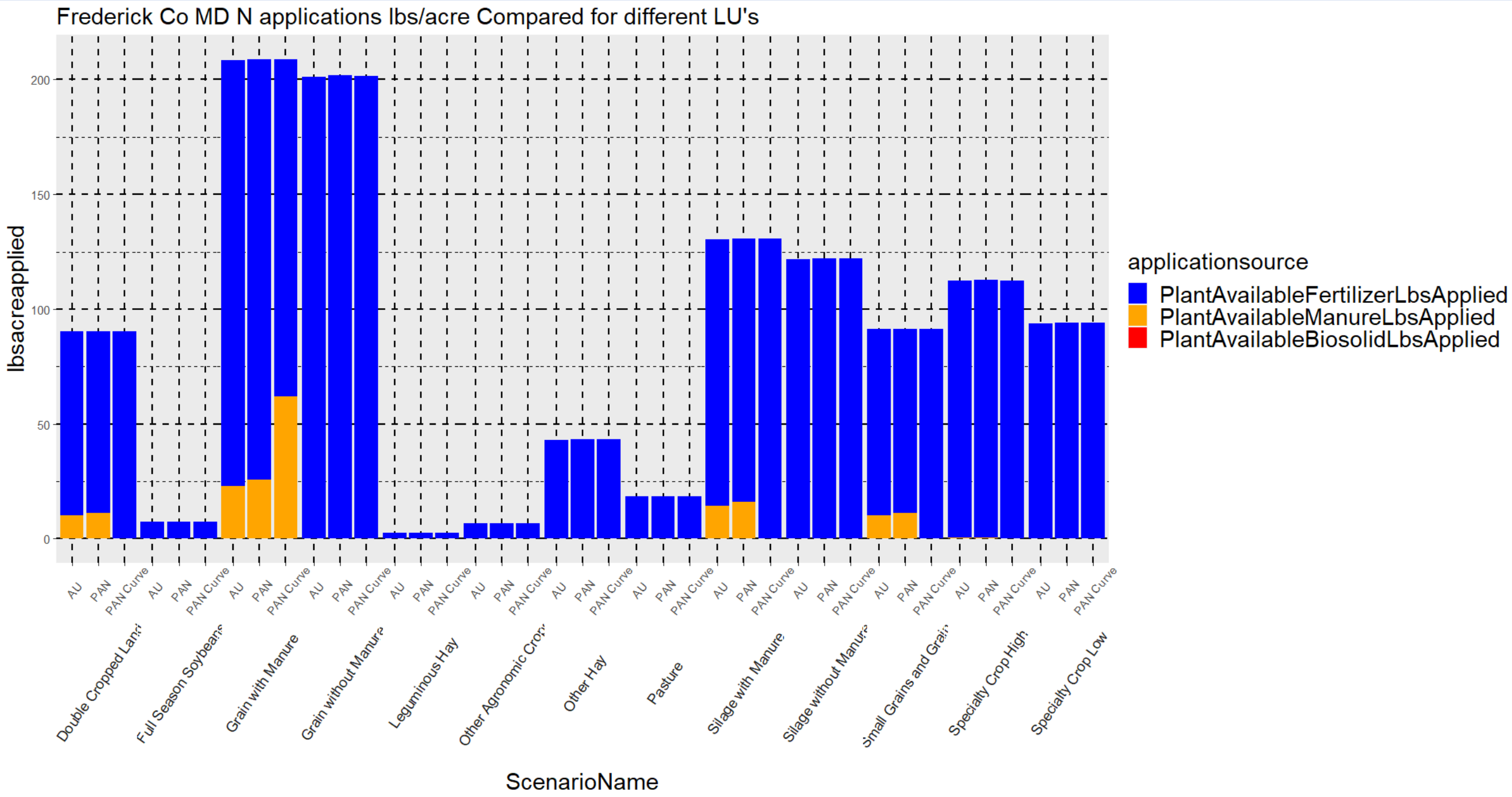
ScenarioName
applicationsource
PlantAvailableFertilizerLbsApplied
PlantAvailableManureLbsApplied
PlantAvailableBiosolidLbsApplied

One more look:

- Frederick County, MD
  - All manure to Grains with manure
  - No manure to other Land Uses


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

Summary

- The current application process leads to low manure application over large areas
- By separating grains with manure as its own application category there is a shift to higher application over fewer acres
- This has variations across counties

Questions?