July AMT Office Hours: Manure application

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7/14/2024

Recap: Manure Applications 3.4

May 2024

- Land Uses

June 2024

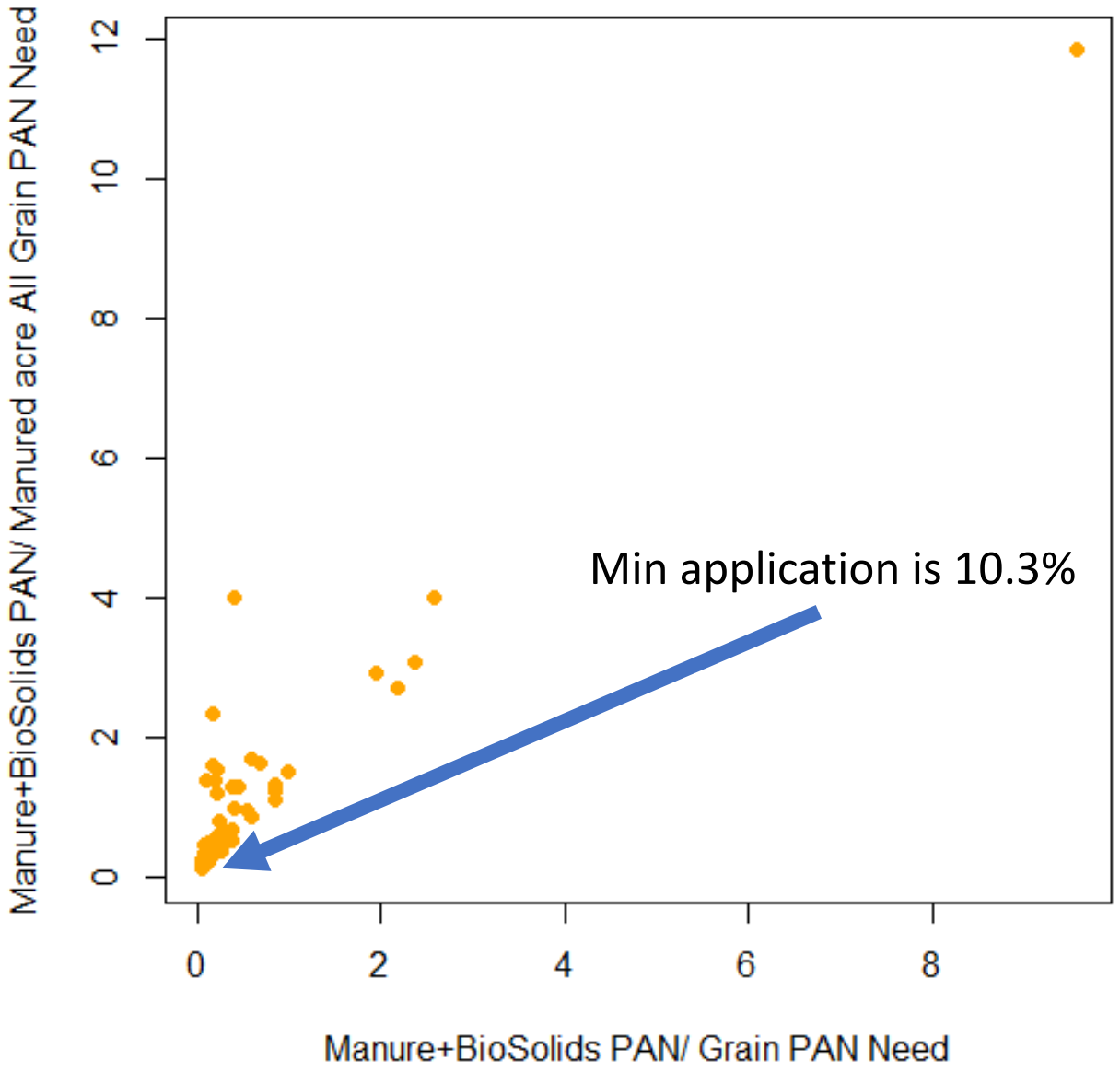
- Determine acres of grain with manure using Plant Available Nitrogen

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



What are the manure eligible Land Uses?

- 14 total Land Uses
- **11 are ELIGIBLE to receive nutrients from manure**
  - **NOTE* not all the crops in each Land Use are manure eligible (e.g. Strawberries in Specialty)**

Chesapeake Bay Average			
Land class	Land Use	Loading Rate Ratio	Loading Rate (pounds per acre per year)
Cropland	Double Cropped Land	0.79	30.9
	Full Season Soybeans	0.71	27.7
	Grain with Manure	1.4	54.7
	Grain without Manure: **Reference land use**	1	39.1
	Other Agronomic Crops	0.45	17.6
	Silage with Manure	1.62	63.3
	Silage without Manure	1.16	45.3
	Small Grains and Grains	0.84	32.8
	Specialty Crop High	1.34	52.4
	Specialty Crop Low	0.31	12.1
Pasture	Ag Open Space	0.43	5.1
	Legume Hay	0.74	8.7
	Other Hay	1.04	12.3
	Pasture: **Reference Land Use**	1	11.8

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

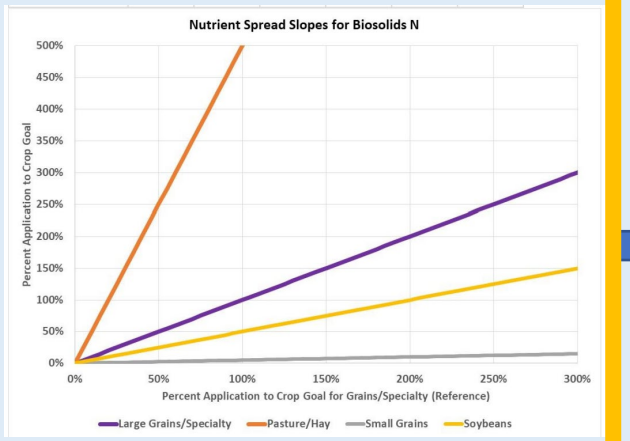
Group 3

- Soybeans
- Legume Hay

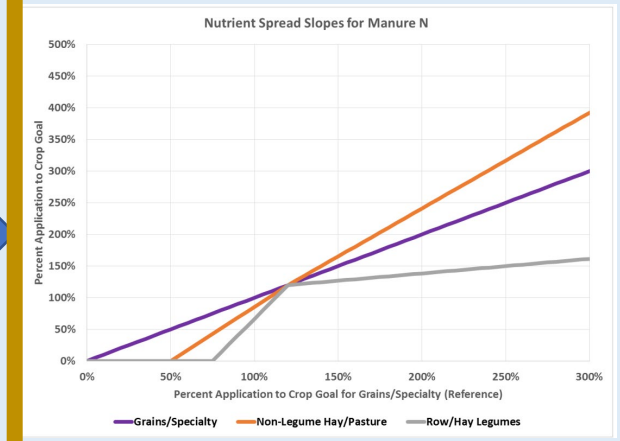
- A larger number of acres pulls from a limited pool of manure
- Creates a low manure application rate to many acres
- There should be more manure utilized per acre then what CAST currently has

How are nutrients applied?

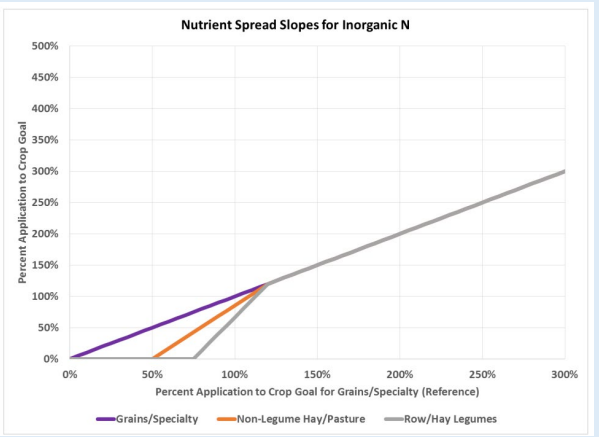
- Sequentially: 1 - biosolids, 2 - manure, 3 - inorganic fertilizer
- Plant Available Nitrogen
- Meet crop need

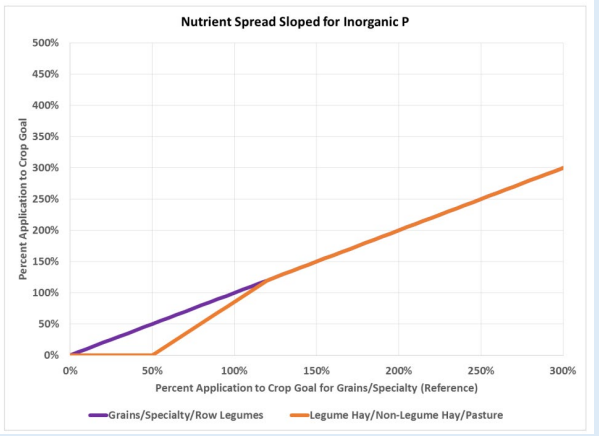


Biosolids



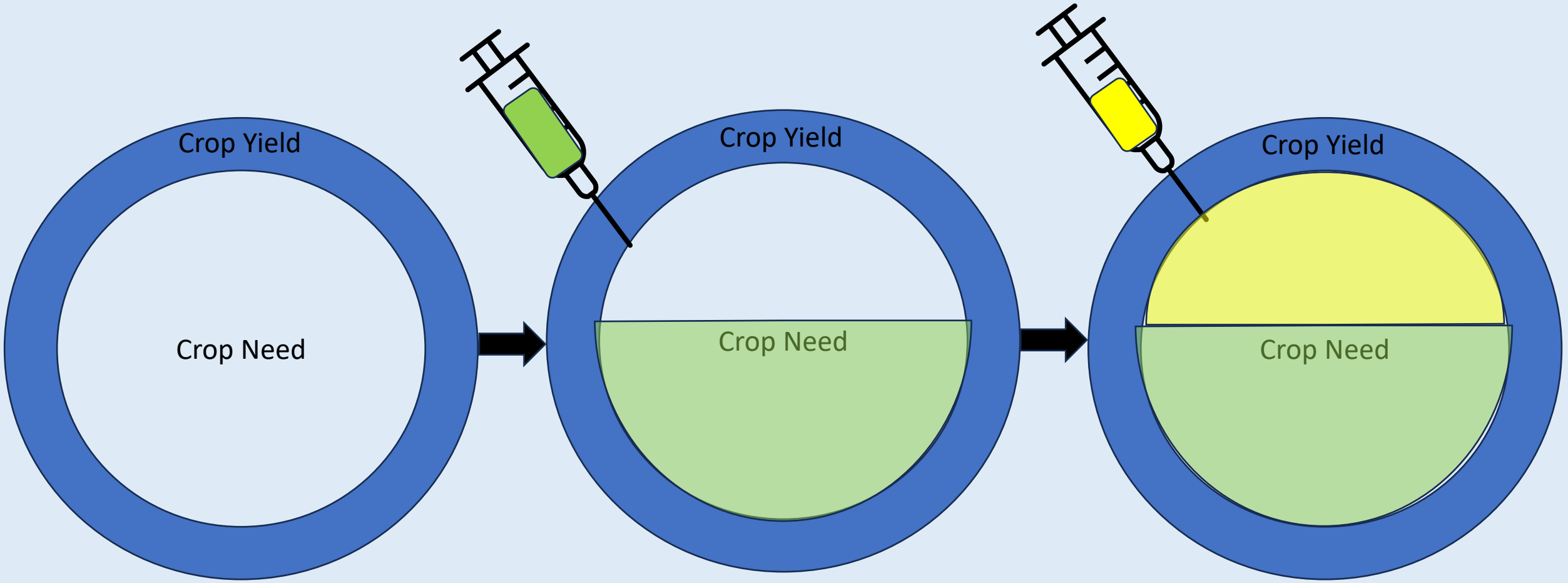
Manure





Inorganic Fertilizer

Let’s recap how applications work:

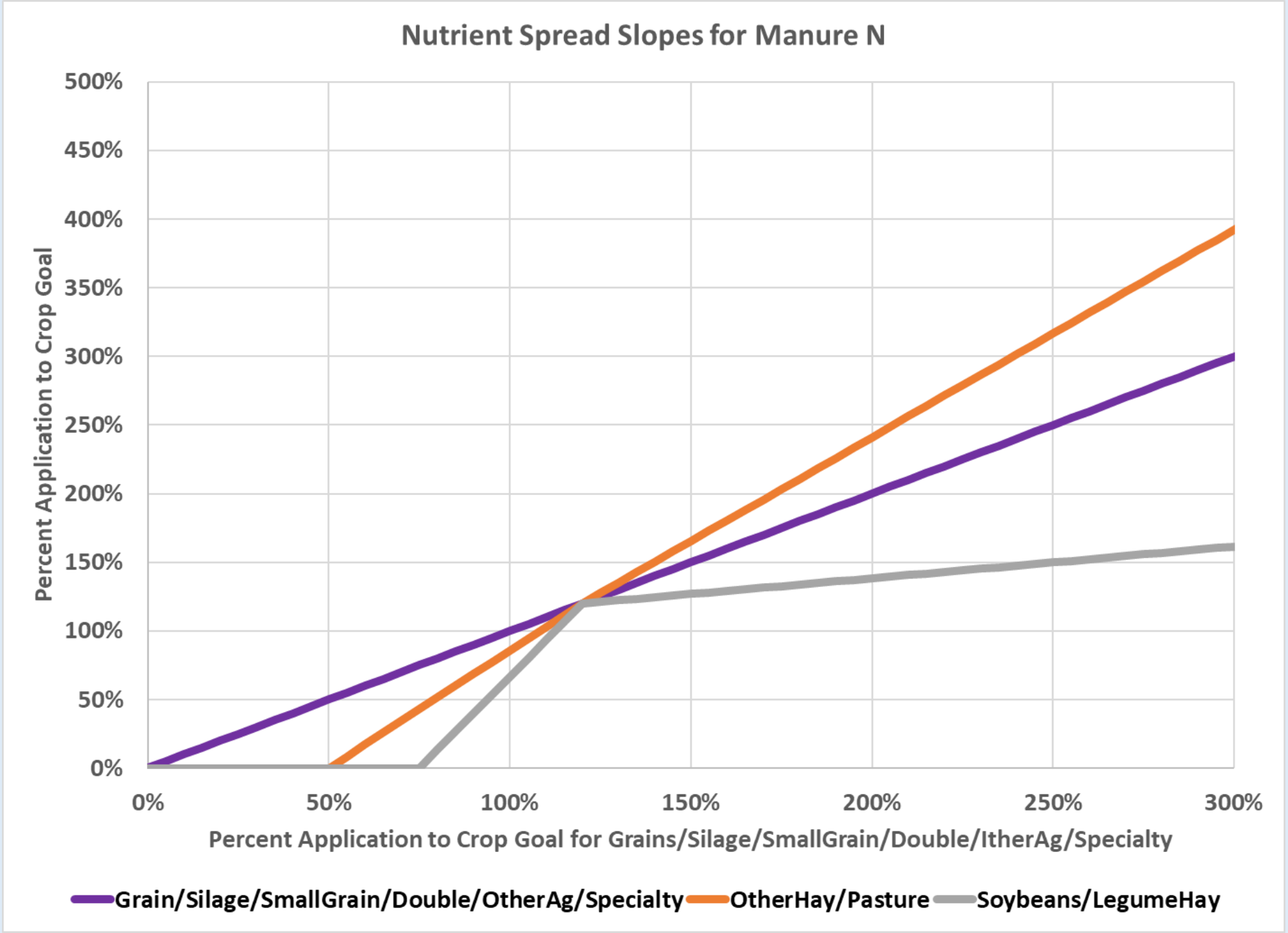


Find an observed yield (NASS) and calculate the nutrients used to grow that yield (crop need)

Organic nutrients are applied

Inorganic nutrients are applied

Graphical display of nutrient application



Picture display of manure nutrient application

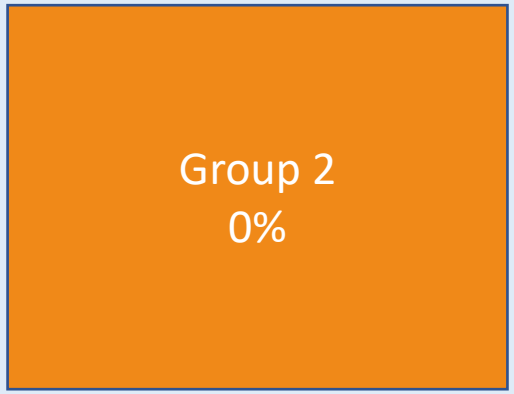
Group 1:
Grains/specialty

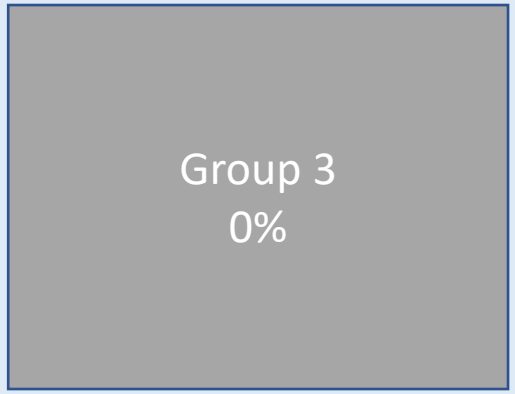
Group 2:
Non-legume hay/pasture

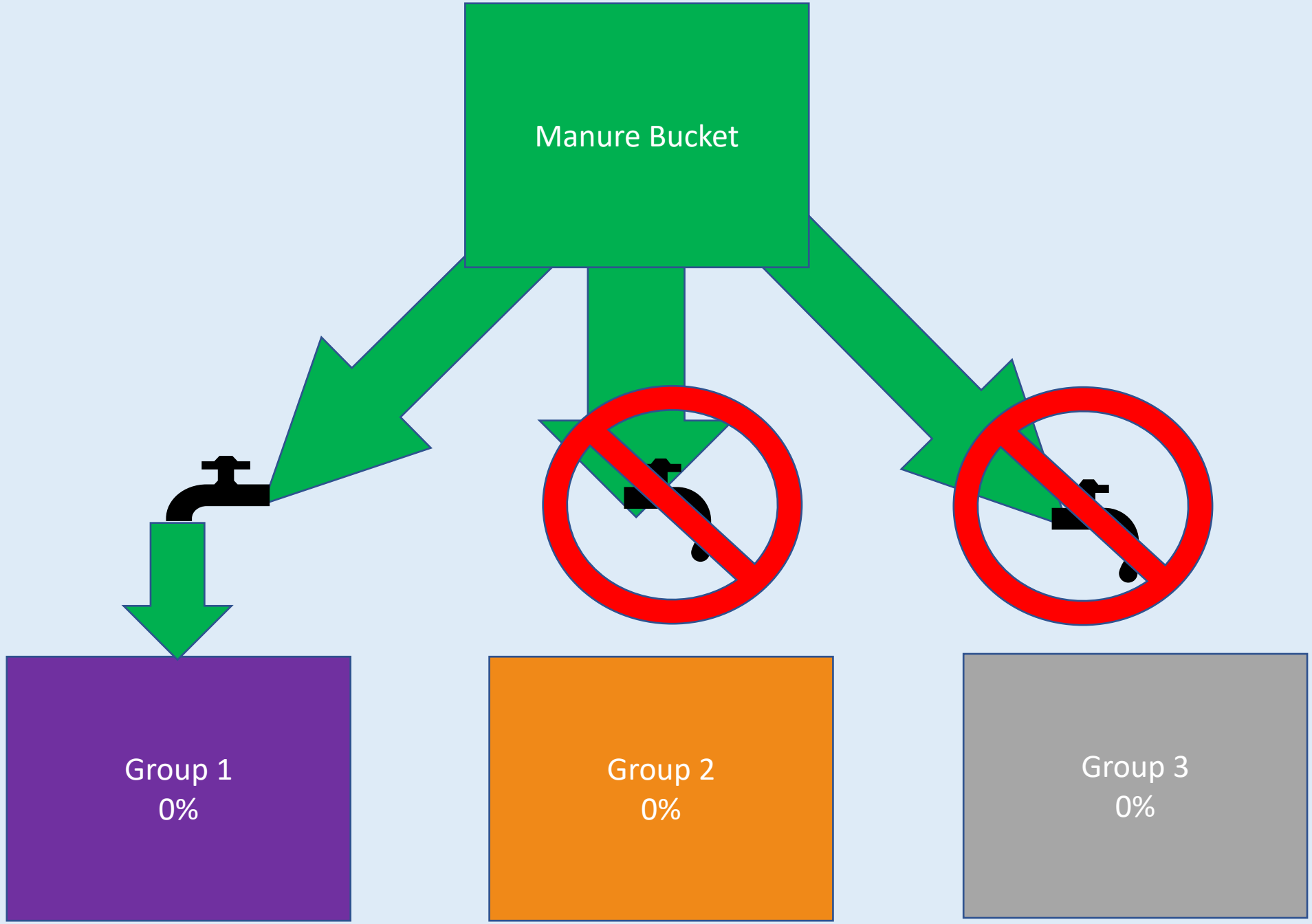
Group 3:
Row/hay legume

Nutrient source

Percentage of crop need met

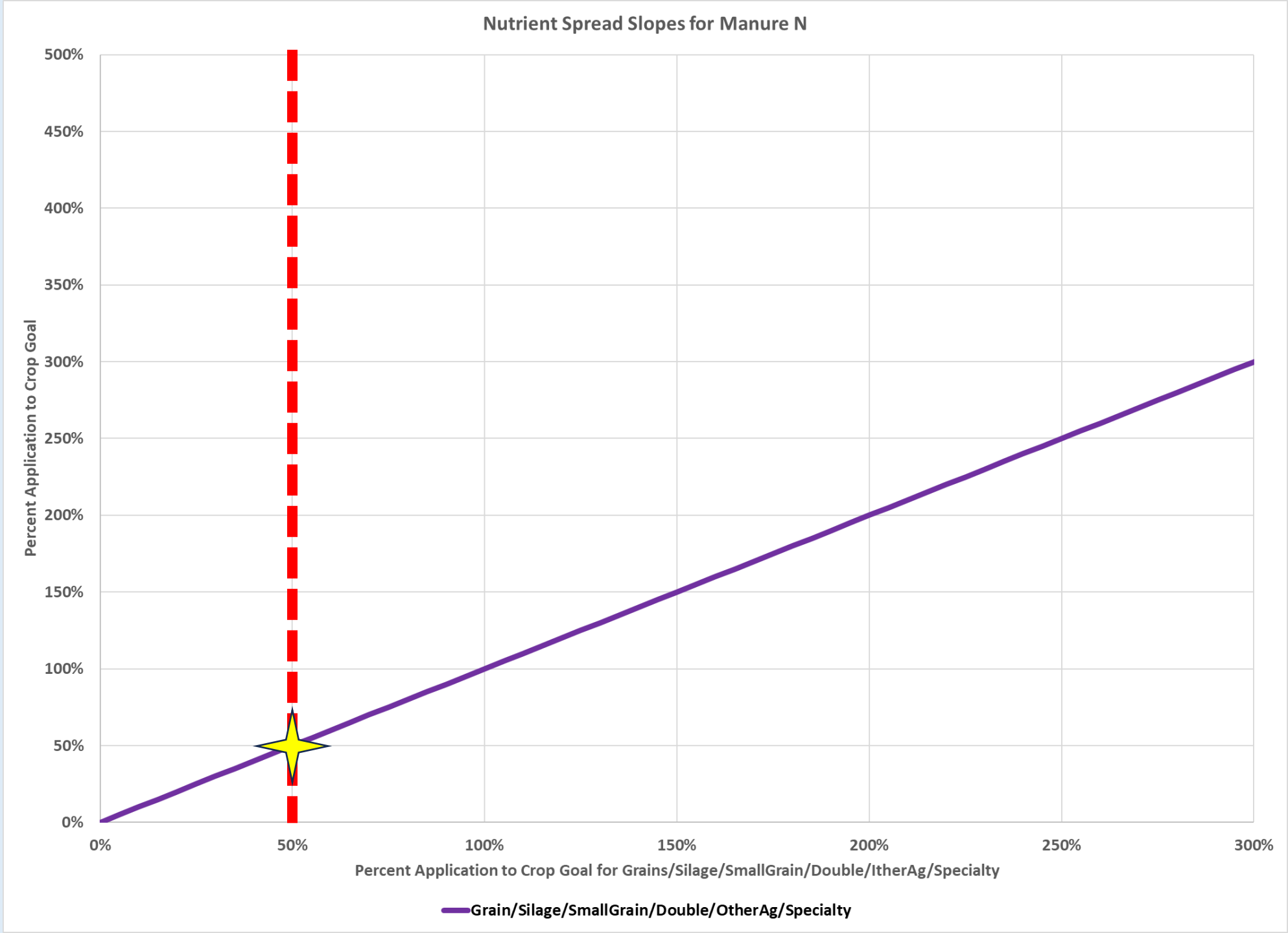


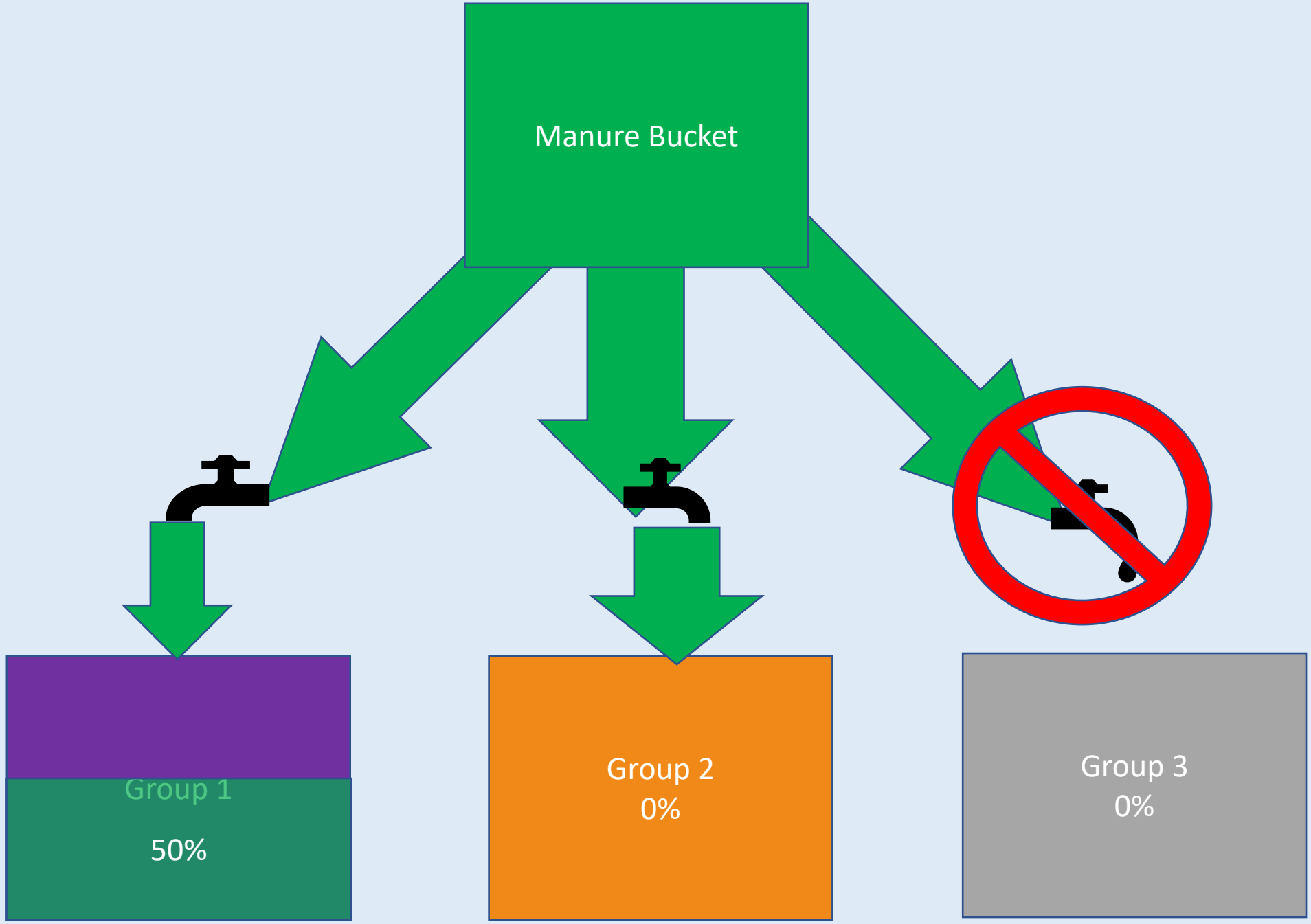



Manure Bucket
Group 1
0%
Group 2
0%
Group 3
0%

Group 1

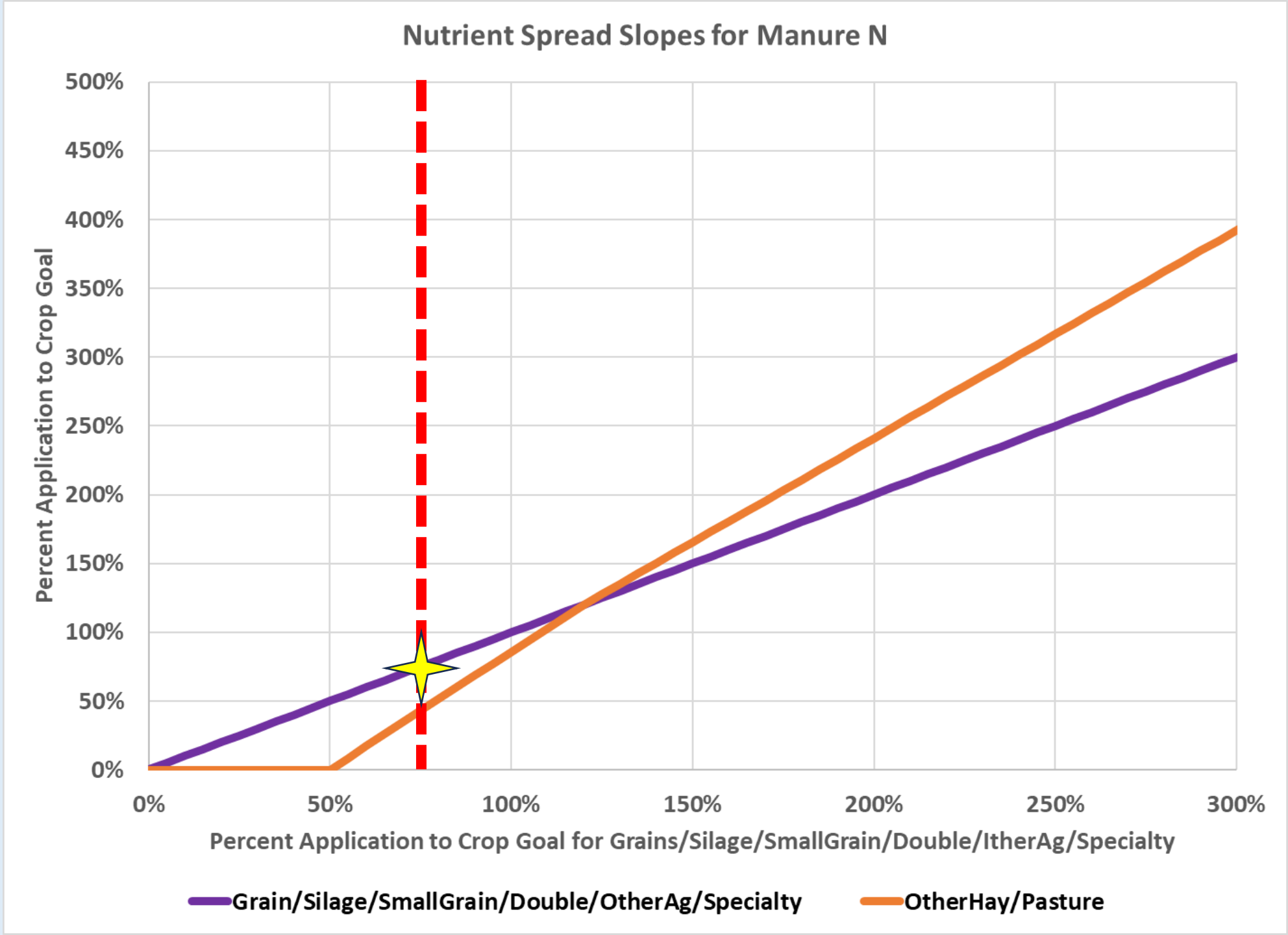
- Start with:
  - Grain
  - Silage
  - Small Grains
  - Double cropped
  - Other crops
  - Specialty (high and low)
- Go until each of these crops has 50% of its need met.

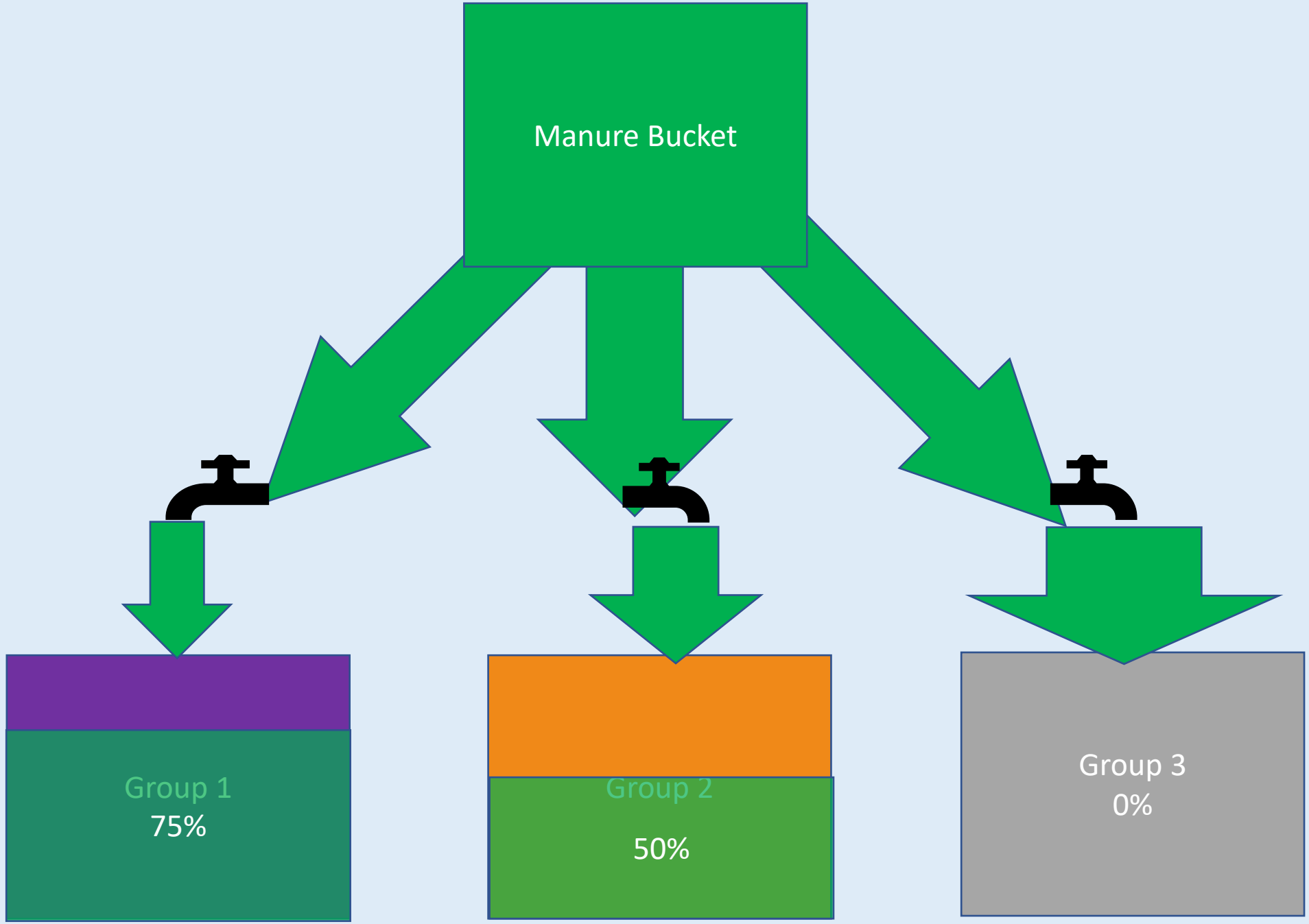



Manure Bucket
Group 1
50%
Group 2
0%
Group 3
0%

Group 2

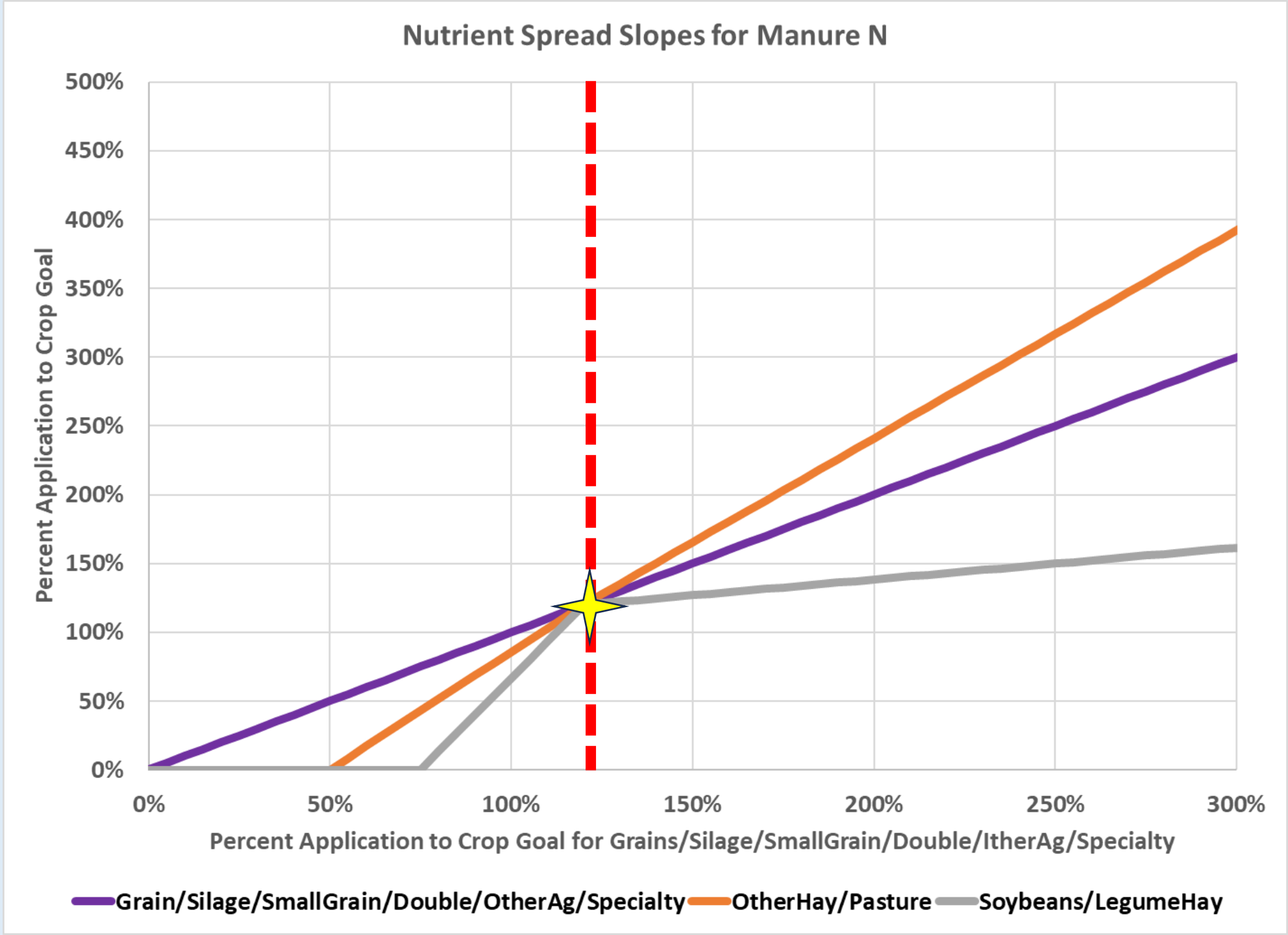
- We will KEEP applying to Group 1
- Begin applying to:
  - Other Hay
  - Pasture
- Go until we hit 75% of crop need for Group 1

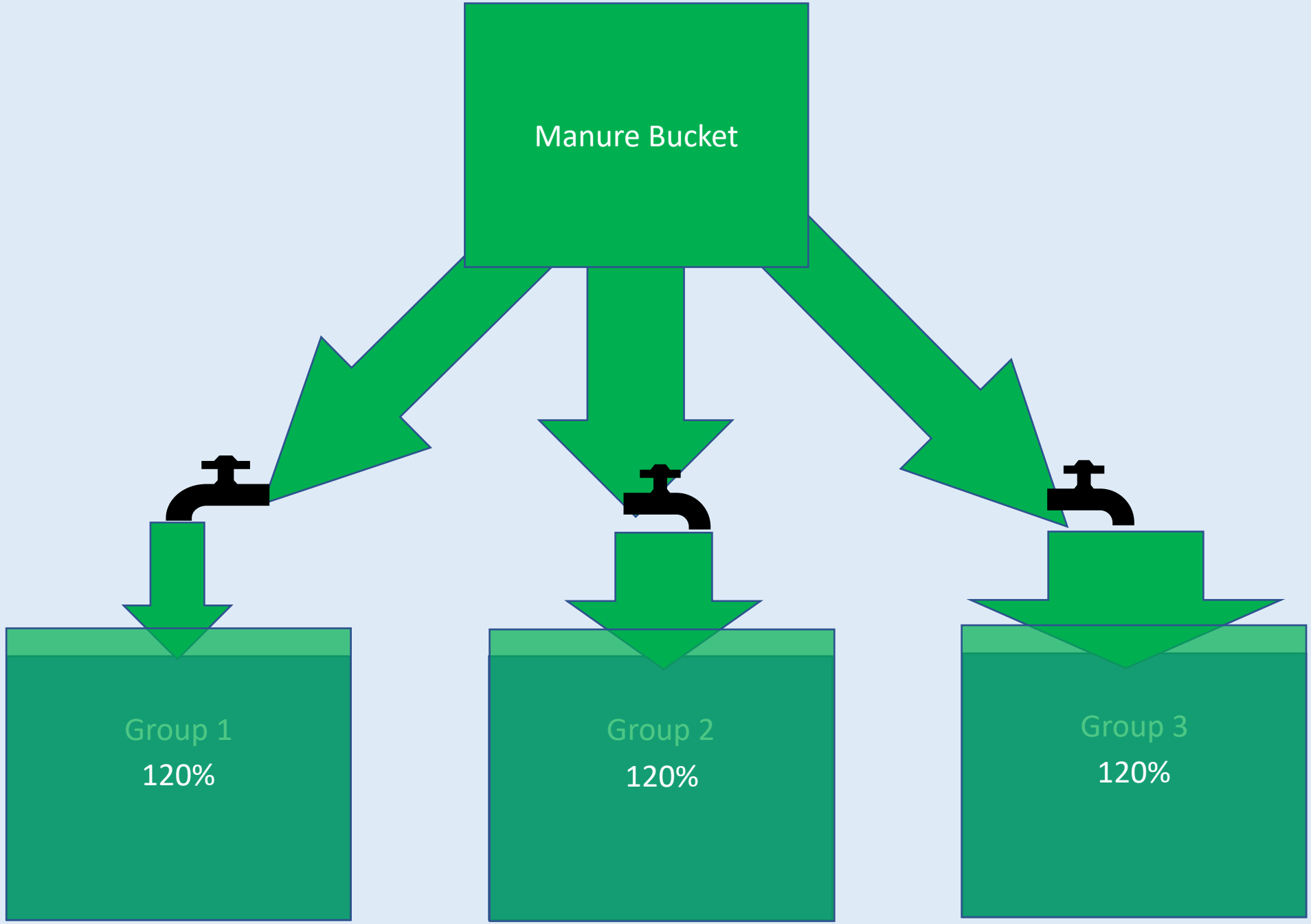



Manure Bucket
Group 1
75%
Group 2
50%
Group 3
0%

Group 3

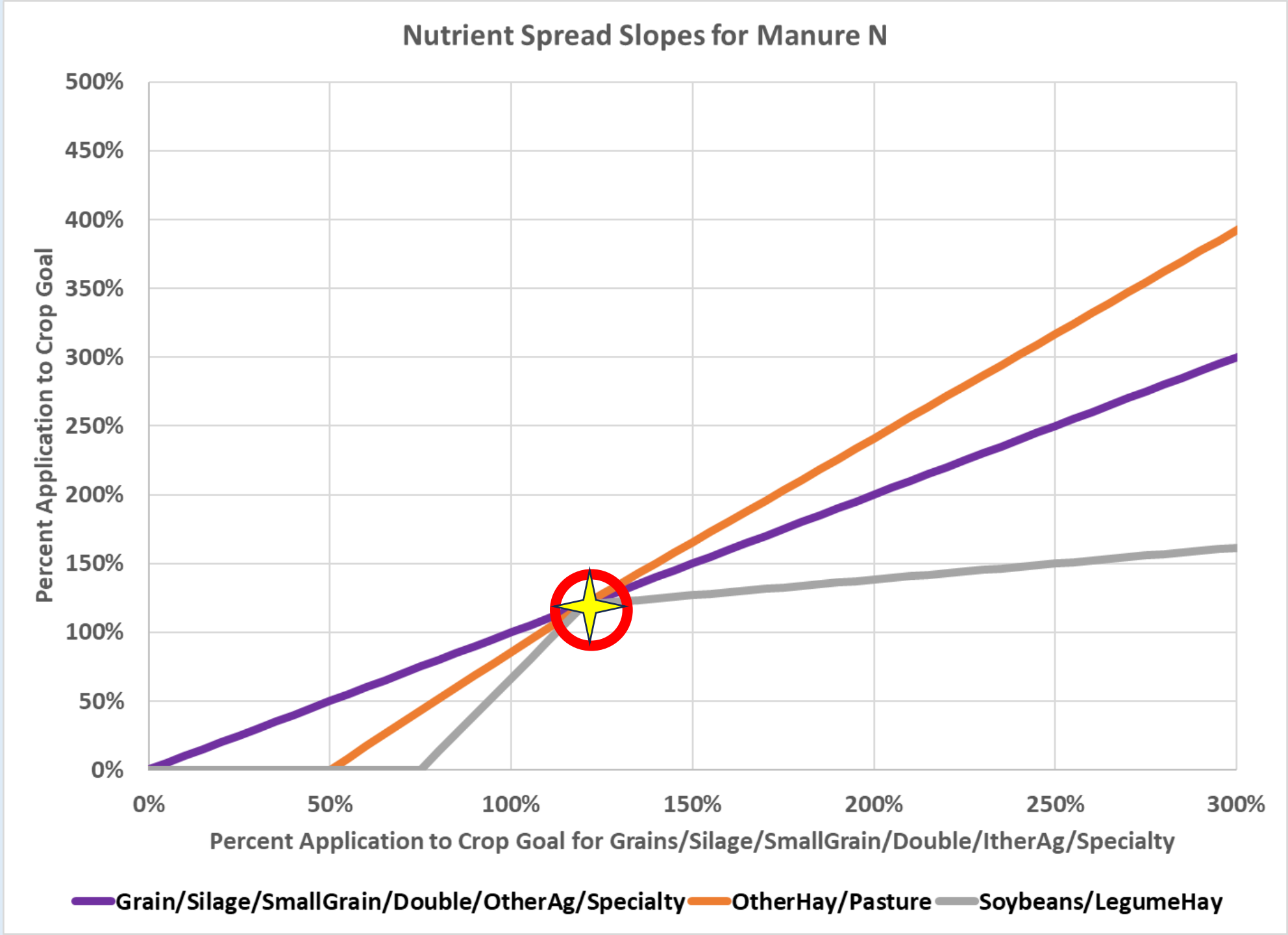
- We will KEEP applying to Groups 1 AND 2
- Begin applying to:
  - Soybeans
  - Legume Hay

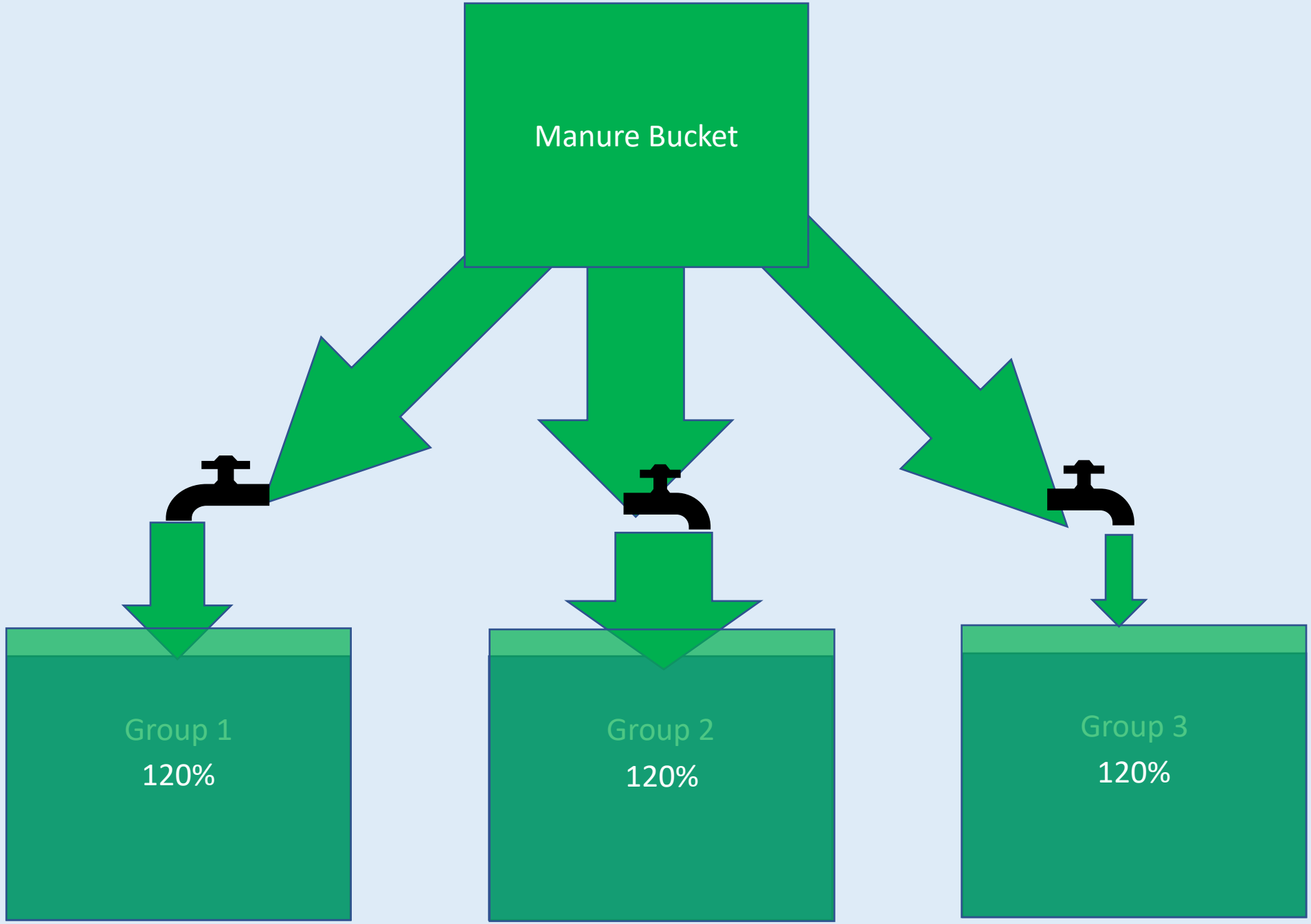



Manure Bucket
Group 1
120%
Group 2
120%
Group 3
120%

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




Manure Bucket
Group 1
120%
Group 2
120%
Group 3
120%

To summarize:

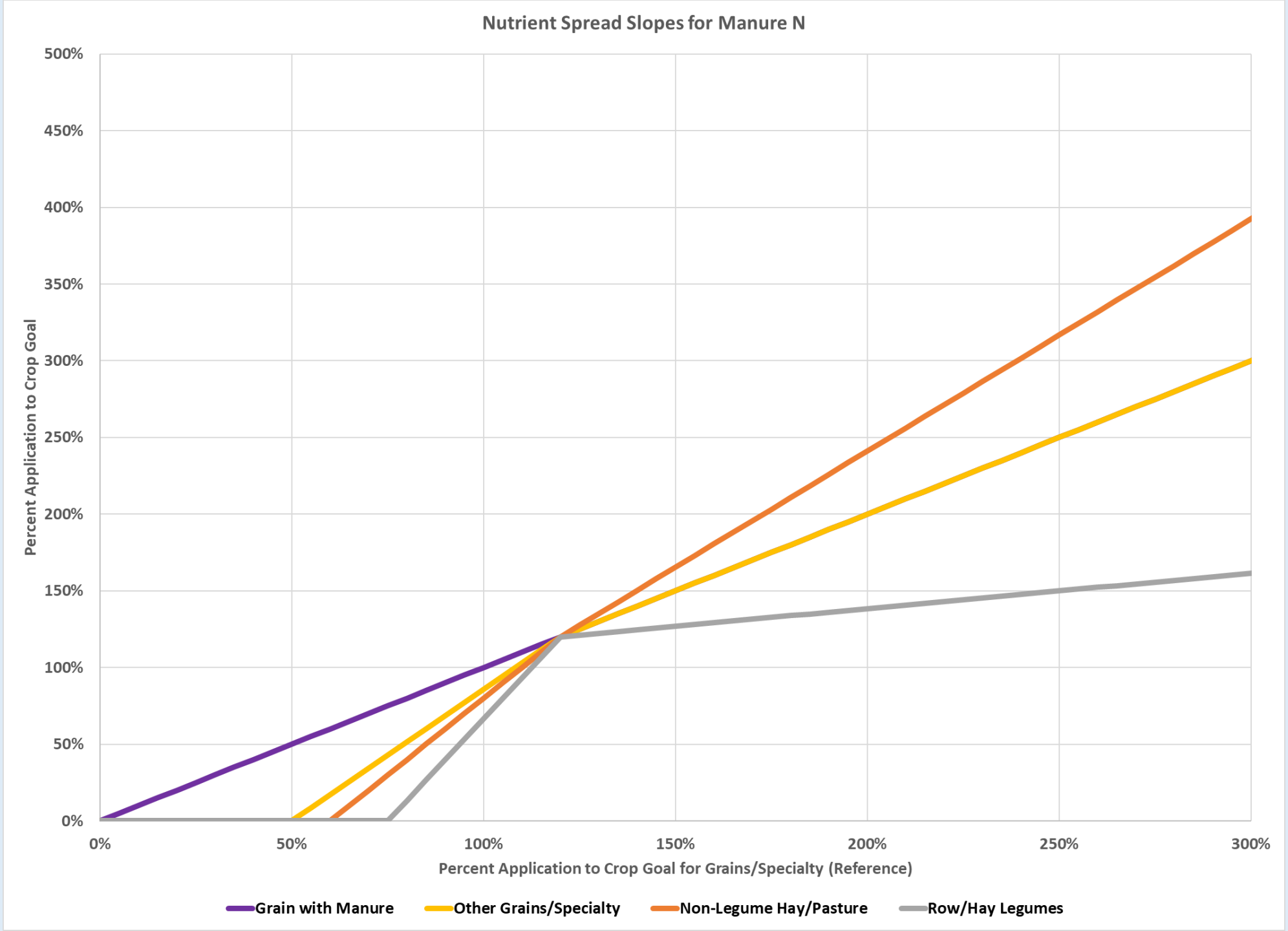
There is a specified order for applying nutrients to different Land Uses

The current framework causes the grains with manure Land Use to receive a lower application rate per acre for grains receiving manure then it should

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

Questions?

New Data for Phase 7

May 2024

- Loss of 2024 county annual surveys
- Possible use of industry data

June 2024

- Discussion about new data for manure applications

One possible avenue: Poultry industry

- Direct collection
  - Weights
  - Numbers
  - Manure/litter generation
  - Nutrient content
- Need to think about incorporating