

CCA Pretest

Legume & Manure Credits

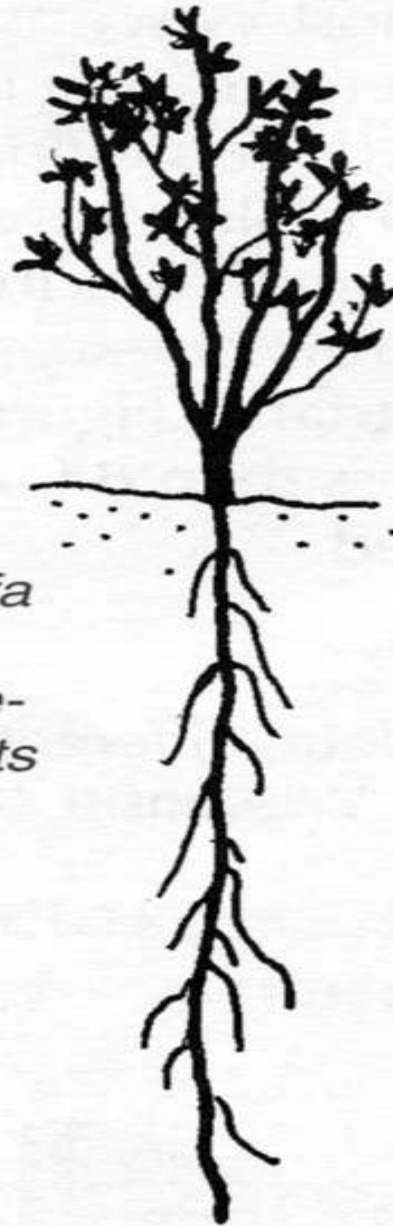


Nitrogen credits for forage legumes

Based on:

- Crop
- Soil Texture
- Plant density
- Harvest management

In a mature alfalfa plant, 40-60% of the N is in above-ground plant parts and 40-60% is in the roots.



Legume Nitrogen credits

Forages (alfalfa) *:

- Good stand ($>70\%$) = 190 lb N/a
- Fair stand (50%) = 160 lb N/a
- Poor stand ($<30\%$) = 130 lb N/a

* Use 80% of alfalfa credits for red clover & birdsfoot trefoil.

Legume Nitrogen credits

- Reduce credit by 50 lb N/a on sands and loamy sands
- Reduce credit by 40 lb N/a if less than 8 in. of regrowth
- Second year credits:
 - 50 lb N/a for good or fair stand
 - No credit on sand or loamy sand

Nitrogen credits for alfalfa

Stand density	Sandy soils		Other soils	
	Regrowth			
	≤8"	>8"	≤8"	>8"
	-----lb N/a-----			
Good <i>(70-100%, >4 plants/sq ft)</i>	100	140	150	190
Fair <i>(30-69%, 1.5-4 plants/sq ft)</i>	70	110	120	160
Poor <i>(0-29%, <1.5 plants/sq ft)</i>	40	80	90	130

Legume N credits not affected by:

- Time of killing
 - spring or fall
- Method of killing
 - herbicide, tillage, or winterkill
- Tillage

Legume N credits

- Key information:
 - stand density
 - regrowth in late October
- Confirm credits with presidedress soil nitrate test (PSNT)

Legume N credits

- Vegetable crops:
 - Peas, beans, dry beans;
credit 20 lb N/a
 - No credit on sand or loamy sand

Nitrogen credits for soybean

- Credit 40 lb N/acre
- Credit varies over sites and years
- Credit not affected by soybean residue
- Use preplant soil nitrate test to fine-tune credit
- No credit on sands or loamy sands



Calumet

END PRODUCTS
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What you need to know

1. Manure contains nutrients
2. All manure is not the same
3. All manure nutrients are not available
4. Some available nutrients can be lost
5. Amount applied

Average nutrient & dry matter content from solid manure

Species	% Dry Matter	N	P ₂ O ₅	K ₂ O	S
----- Pounds per ton -----					
Dairy	24	10	5	9	1.3
Beef	35	14	9	11	1.5
Swine	20	14	10	9	2.5
Duck	35	17	21	30	3.3
Chicken	60	40	50	30	4
Turkey	60	40	40	30	4
Sheep	45	26	18	40	3.3
Horse	45	10	6	10	1.7

Available and lost nitrogen

$$\text{Avail. N} = \begin{array}{l} \text{inorganic N} \\ + \text{ mineralized N} \\ - \text{ lost N} \end{array}$$

$$\text{Lost N} = \begin{array}{l} \text{volatilized N} \\ + \text{ leach N} \\ + \text{ denitrified N} \\ + \text{ soil stored N} \end{array}$$

N availability studies with dairy manure:

- 37 studies with dairy manure
 - 4 incubations, 15 apparent N recovery by crops, 18 fertilizer equivalence, 1 model fitting
 - 17 liquid
 - 18 solid
 - 2 dried
- Average availability
 - Range 10 – 54%
 - Mean 37.5%
- Within study availability
 - 10 – 65%

Phosphorus availability

- Most commonly based on change in soil test
- Less than P fertilizer
- Need to do crop trials on responsive soils
- 40 - 90%

Potassium availability

- K in liquid fraction
- 70 – 100%

Summary:

- Availability depends on content, release, and losses
- Nitrogen
10 – 60%; average 37%
- Phosphorus
40 – 90%; average 60%
- Potassium
70 – 100%; average 80%
- Residual effects significant
0.30 – 0.10 – 0.05 – 0.02

Nutrient availability as determined by fertilizer equivalence for multiple manure applications

Location	Number of Applications		
	1	2	3
	---- Avg. N Availability (%) ----		
Fall River	31	39	47
Sun Prairie	48	49	54
Baraboo	18	20	26

Where do we put it:

1. Where nutrients can be recycled
2. Where environmental risks are small
3. Consider crop year and rotation
4. Consider restrictions



Questions?