

# Manure Nutrient Credits

A large black pipe runs across a field of brown, harvested corn. In the background, a red metal structure, possibly a manure applicator, is visible. The sky is overcast and grey.

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# What you need to know

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- Manure is good stuff !!
  - Contains nutrients
- All manure is not created equally
- All manure nutrients are not available
  - Total nutrient content = inorganic + organic
- Some nutrients can be lost
- Nutrient credit is dependent upon
  - Amount of manure applied among other things

# Average nutrient & dry matter content of manure

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| Species – Storage      | DM | N                  | P <sub>2</sub> O <sub>5</sub> | K <sub>2</sub> O |
|------------------------|----|--------------------|-------------------------------|------------------|
|                        | %  | lb/T or lb/1000gal |                               |                  |
| Dairy – Solid          | 24 | 10                 | 5                             | 9                |
| Dairy – Liquid         | 6  | 24                 | 9                             | 20               |
| Swine – Solid          | 20 | 14                 | 10                            | 9                |
| Swine – Liquid indoor  | 7  | 50                 | 42                            | 30               |
| Swine – Liquid outdoor | 4  | 34                 | 16                            | 20               |
| Chicken – Solid        | 60 | 40                 | 50                            | 30               |
| Turkey – Solid         | 60 | 40                 | 40                            | 30               |
| Poultry – Liquid       | 3  | 16                 | 10                            | 12               |

# Nitrogen Availability

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- Total N =  $\text{NH}_4\text{-N}$  + organic N

Available, but  
can be lost thru  
volatilization

Not available  
until  
mineralized

- Available N =  $\text{NH}_4\text{-N}$  that isn't lost

+

Mineralized N from organic N

# Nitrogen Availability

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- First year availability varies with animal species and storage/management
  - 2<sup>nd</sup> year is 10 %, regardless of species/storage
  - 3<sup>rd</sup> year is 5%, regardless of species/storage
- Greater availability if manure is incorporated within 3 days of application

# Phosphorus Availability

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- Total P = inorganic P + organic P
- Commonly considered to be less available than P fertilizer
- 60 % of total  $P_2O_5$  available in 1<sup>st</sup> year regardless of species or storage
  - 2<sup>nd</sup> year is 10 %
  - 3<sup>rd</sup> year is 5%
- More research is needed in this area

# Potassium Availability

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- K in liquid fraction
- 80 % available in first year
  - 2<sup>nd</sup> year is 10 %
  - 3<sup>rd</sup> year is 5%
- Actual availability may be 70-100%



# Estimated 1<sup>st</sup> Year Nutrient Availability

| Species   | N   | P <sub>2</sub> O <sub>5</sub> | K <sub>2</sub> O |
|---|-----|-------------------------------|------------------|
| Dairy, surface applied                                  | 30% | 60%                           | 80%              |
| Dairy, incorporated                                     | 40% | 60%                           | 80%              |
| Veal calf, surface applied                              | 40% | 60%                           | 80%              |
| Veal calf, incorporated                                 | 50% | 60%                           | 80%              |
| Beef, surface applied                                   | 25% | 60%                           | 80%              |
| Beef, incorporated                                      | 35% | 60%                           | 80%              |
| Swine, solid surface applied                            | 50% | 60%                           | 80%              |
| Swine, solid incorporated                               | 65% | 60%                           | 80%              |
| Swine, liquid indoor pit, surface                       | 50% | 60%                           | 80%              |
| Swine, liquid indoor pit, incorporated                  | 65% | 60%                           | 80%              |
| Swine, liquid outdoor pit, surface                      | 50% | 60%                           | 80%              |
| Swine, liquid outdoor pit, incorporated                 | 65% | 60%                           | 80%              |
| Swine, liquid, farrow-nursery indoor pit, surface       | 50% | 60%                           | 80%              |
| Swine, liquid, farrow-nursery indoor pit, incorporated* | 65% | 60%                           | 80%              |
| Duck, surface applied                                   | 50% | 60%                           | 80%              |
| Duck, incorporated                                      | 60% | 60%                           | 80%              |
| Chicken, surface applied                                | 50% | 60%                           | 80%              |
| Chicken, incorporated                                   | 60% | 60%                           | 80%              |
| Turkey, surface applied                                 | 50% | 60%                           | 80%              |
| Turkey, incorporated                                    | 60% | 60%                           | 80%              |
| Poultry, liquid, surface                                | 50% | 60%                           | 80%              |
| Poultry, liquid, incorporated                           | 60% | 60%                           | 80%              |
| Sheep, solid surface applied                            | 25% | 60%                           | 80%              |
| Sheep, solid incorporated                               | 35% | 60%                           | 80%              |
| Horse, solid surface applied                            | 25% | 60%                           | 80%              |
| Horse, solid incorporated                               | 35% | 60%                           | 80%              |

2<sup>nd</sup> year availability is 10%

3<sup>rd</sup> year availability is 5%

From: Technical Note of the  
NRCS 590 Standard



# Manure Nutrient Crediting Example

- Dairy Slurry
- 4000 gal/a
- Knifed in

Slurry  
Analysis →

|                               |                 |
|-------------------------------|-----------------|
| Total N                       | 30 lb /1000 gal |
| P <sub>2</sub> O <sub>5</sub> | 9 lb /1000 gal  |
| K <sub>2</sub> O              | 20 lb /1000 gal |

| Year after application | Nutrient Credits            |   |  |
|------------------------|-----------------------------|---|--|
|                        | N                           | P <sub>2</sub> O <sub>5</sub>                             | K <sub>2</sub> O                           |
| 1 <sup>st</sup>        | 0.4 x 30 x 4 =<br>48 lb N/a | 0.6 x 9 x 4 =<br>22 lb P <sub>2</sub> O <sub>5</sub> /a   | 0.8 x 20 x 4 =<br>64 lb K <sub>2</sub> O/a |
| 2 <sup>nd</sup>        | 0.1 x 30 x 4 =<br>12 lb N/a | 0.1 x 9 x 4 =<br>3.6 lb P <sub>2</sub> O <sub>5</sub> /a  | 0.1 x 20 x 4 =<br>8 lb K <sub>2</sub> O/a  |
| 3 <sup>rd</sup>        | 0.05 x 30 x 4 =<br>6 lb N/a | 0.05 x 9 x 4 =<br>1.8 lb P <sub>2</sub> O <sub>5</sub> /a | 0.05 x 20 x 4 =<br>4 lb K <sub>2</sub> O/a |

# Manure Nutrient Crediting

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- Remember:
- If manure is applied 2 or more consecutive years:
  - Then take credits for manure just applied + all other applications in the past 3 years

# Where/How do we apply it:

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1. Where nutrients can be used
  - Replace or reduce fertilizer
  - Consider crop year and rotation
2. Where environmental risks are small
3. Follow regulations!

# Questions?

