# Worksheet 4-1

## Estimating Plant Available Nitrogen (PAN) in Manure

**Manure**_____

1. **Total nitrogen (N) content**
   - Expressed as %.
   - Obtain value from the manure analysis.

2. **Ammonium nitrogen ($NH_4^+$) content**
   - Expressed as %.
   - Obtain value from the manure analysis.

3. **Organic nitrogen content**
   - Expressed as %.
   - Subtract ammonium nitrogen ($NH_4^+$) content (**#2**) from total nitrogen (N) content (**#1**).

4. **Manure mineralization factor**
   - Expressed as a decimal.
   - Refer to the *Infocard*.

5. **Available organic nitrogen**
   - Expressed as %.
   - Multiply organic nitrogen content (**#3)** by the manure mineralization factor (**#4**).

6. **Ammonium conservation factor**
   - Depends upon incorporation practices.
   - Refer to the *Infocard*.

7. **Available ammonium nitrogen**
   - Expressed as %.
   - Multiply ammonium nitrogen ($NH_4^+$) content (**#2**) by the ammonium conservation factor (**#6**).

8. **PAN in manure**
   - Expressed as lbs/ton or lbs/gallon.
   - Add the available ammonium nitrogen (**#7**) to the available organic nitrogen (**#5**) and multiply by 20 if manure is solid or semi-solid or multiply by 0.0837 if manure is liquid.

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