

## AGRY 515 Plant Mineral Nutrition

### Classification by Function

#### Nitrogen Assimilation and Function 1

#### Powerpoint file: N-Assimilation\_Slides\_2012

Nutrient Function - 4 or more general classes with overlap

- Structural Components (Table 1)

- Energy Currency

- Osmotocant

- Enzyme Activators (Table 2)

- Redox Reagents (Table 3)

- Uncertain Function (Table 4)

Overview of N upake and assimilation (Fig. 1)

Compartmentalization of nitrate and nitrite in leaf tissue (Fig. 2)

N Assimilation

- Nitrate Reduction (Fig. 3)

  - Nitrate Reductase (NR) (Fig. 3)

  - Nitrate-nitrite reduction interaction in cell (Fig. 4)

  - Nitrite Reductase (NiR) (Fig. 5)

  - Prosthetic Groups

  - Cytoplasm Vs chloroplasts / proplastids

  - Light regulation of nitrate reductase (Fig. 6, 7)

  - Induced enzyme (Fig. 8)

  - Root Vs Shoot reduction: Controlling factors

    - External level of N supply

    - Plant species

    - Plant age and temperature

### ***Can plants store ammonium?***

Ammonium Assimilation

- $\text{NH}_4^+$ ,  $\text{NH}_3$  detoxification

- glutamine synthetase-glutamate synthase pathway

  - low Vs high  $\text{NH}_3$  conditions (Fig. 9, 10, 11)

- Transamination (Fig. 12, Table 5)

N Structural roles

Ammonium Vs Nitrate Nutrition

Calcifuge / Calcicole

Advantages / disadvantages of  $\text{NH}_4^+$  and  $\text{NO}_3^-$