

HAROLD GOETZ

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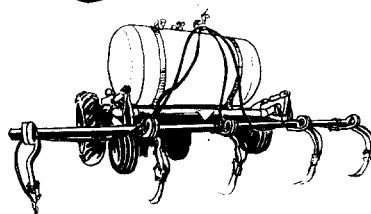
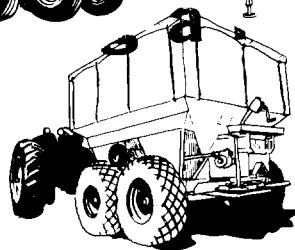
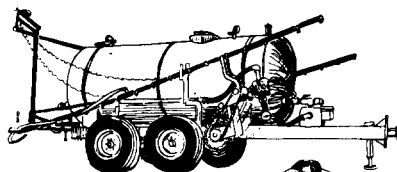
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SOILS AND FERTILIZER

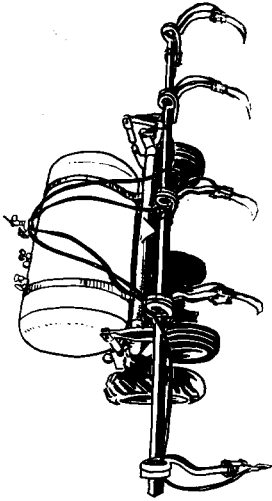
Which Nitrogen Source For Me?



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Guides to Selecting a Nitrogen Fertilizer



NH₃

Source Anhydrous Ammonia (82% N)

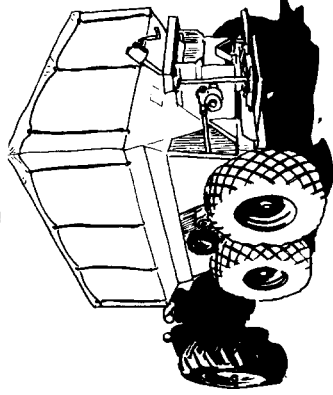
Placement and Time Must be injected into the soil 6-8 inches with conventional applicator. Ammonia is retained by attachment to clay and organic matter, thus any method of application which will seal ammonia in the soil is acceptable. Avoid ammonia applications through sprinkler irrigation systems and through gated irrigation pipe if water is hard.

Row Crops: Can be applied in fall, early winter, early spring, or sidedress on most soils. Applications close to planting should be diagonal or perpendicular to row directions and deep to minimize the chance of seedling injury.

Small Grains: Can be applied pre-plant fall or spring. Special equipment will be necessary for top dressing applications.

Grasses: Acceptable material, but special equipment will be necessary for application.

Precautions Anhydrous ammonia can cause severe burns when in contact with the skin. Gloves, goggles and water are essential for safety in transferring ammonia.



Solids

Sources

Ammonium nitrate (33.5% N)

Urea (45% N)

Ammonium sulfate (21% N)

Ammonium phosphates (N content variable)

Nitric phosphates (N content variable)

All materials are considered equally effective as sources of nitrogen.

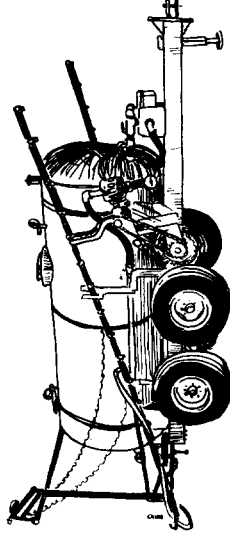
Placement and Time Can be surface applied or incorporated into the soil. Incorporation is advisable for all materials, especially when the soil is warm and dry.

Row Crops: Can be applied in fall, winter, spring or sidedressed on most soils. For application in direct contact with the seed, limit the total nitrogen plus potash to 10 pounds per acre.

Small Grains: Can be applied pre-plant or spring topdressed before jointing. For applications in direct contact with the seed, limit the total nitrogen plus potash to 30 pounds per acre if seed bed is dry and 60 pounds per acre if seed bed is moist.

Grasses: Application for cool-season grasses recommended in early fall, winter, or early spring.

Precautions Can be handled and applied safely. Ammonium nitrate should be stored away from fires and organic materials.



Liquids

Sources

Non-pressure solutions

Urea-ammonium nitrate (28 or 32% N)

Mixed liquids (N content variable)

Pressure solutions

Aqua ammonia (20-21% N)

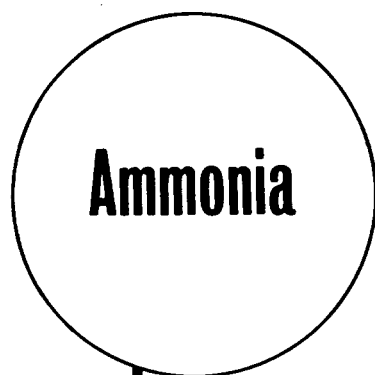
Ammonia-Urea-Ammonium Nitrate (N content variable)

All materials are considered equally effective as sources of nitrogen.

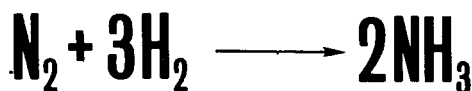
Placement and Time Non-pressure solutions can be surface applied, applied in irrigation water, or incorporated into the soil. Incorporation is advisable for all materials, especially when the soil is warm and dry. Pressure solutions must be injected into the soil with coverage to retain the ammonia.

Non-pressure solutions should be treated similarly to dry materials for time of application to row crops, small grains and grasses. Pressure solutions should be treated similarly to anhydrous ammonia for time of application to row crops, small grains and grasses.

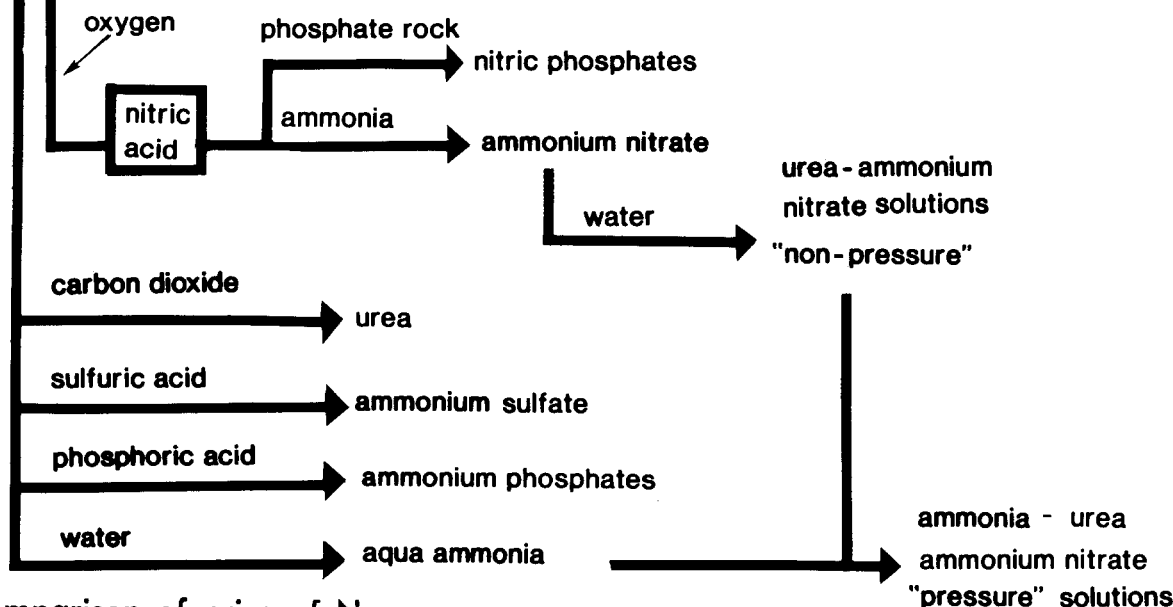
Precautions Can be handled and applied safely. Avoid skin contact as these solutions can cause irritation. Pressure solutions should be handled to avoid breathing of ammonia vapor and contact with the skin and eyes.



Ammonia is the Starting Point for Most Nitrogen Fertilizers



nitrogen hydrogen ammonia



In comparison of price of N materials remember:

$$\text{cost/lb N} + (\text{application cost}^*) = \text{cost per lb applied N}$$

* Includes applicator rental, power costs and labor costs.

Summary statements

Field comparisons of nitrogen materials conducted by North Dakota State University researchers indicate little difference in yield response when the nitrogen materials are applied properly and at recommended rates.

Selection of a nitrogen fertilizer should be based on:

- Cost of **applied** material.
- Adaptability to your operation.
- Availability of material and services in your area.

David A. Whitney, Extension Specialist, Soil Testing; Larry S. Murphy, Associate Professor, Agronomy.

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