

FERTILISING TURFGRASSES

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Fertiliser

- A fertiliser is any material of natural or synthetic origin (other than liming materials) that is applied to soils or to plant tissue to supply one or more plant nutrients essential to the growth of the plant.....

Why do we fertilise?

- to ENHANCE GROWTH
- for a HEALTHY TURF
- to IMPROVE THE PLAYING SURFACE
- for PRESENTATION/COLOUR
- to OUTCOMPETE WEEDS
- to FIGHT DISEASE AND PESTS

- # Bowls is played on grass and not colour

Fertilisation - The Problem

- Turfgrass nutrition is not a precise science:
 - No simple criterion, such as yield, exists to measure success
 - Quality is largely subjective
 - Greatly affected by: Fertiliser source
 - Application rate
 - Application timing

Fertiliser Products

- DRY or SOLID - granular
 - powder
- LIQUID - soil applied
 - foliar applied

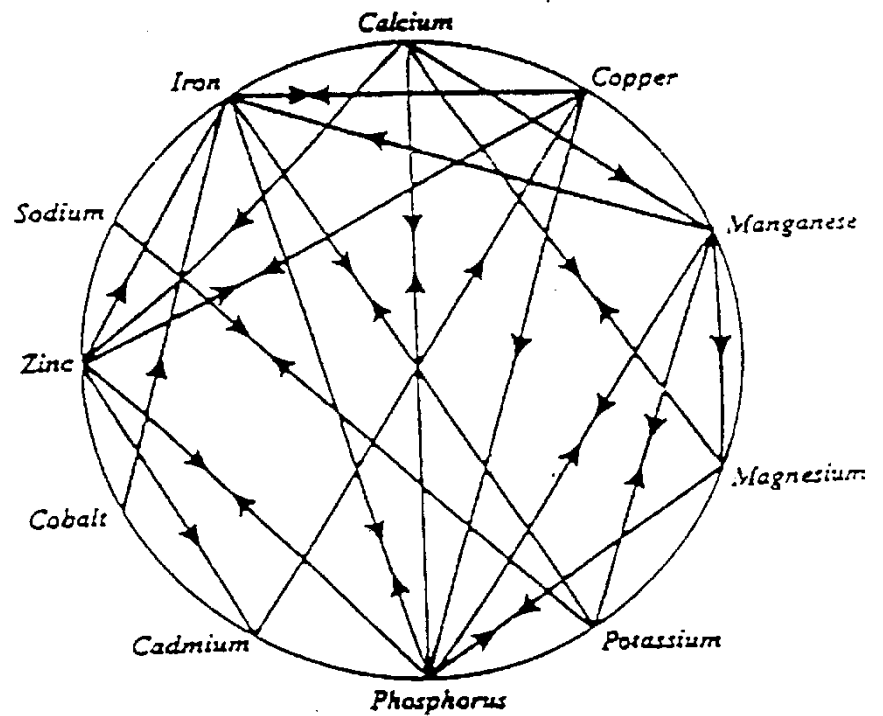
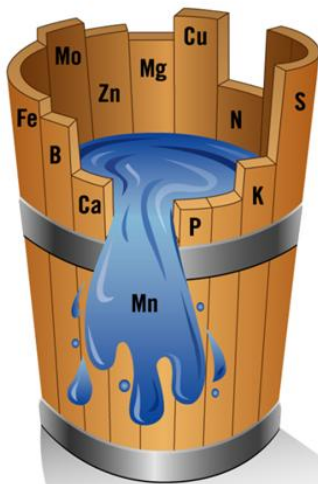
Cation Exchange Capacity

- Is the soils ability or capability for nutrient holding to exchange nutrient solution to the plant

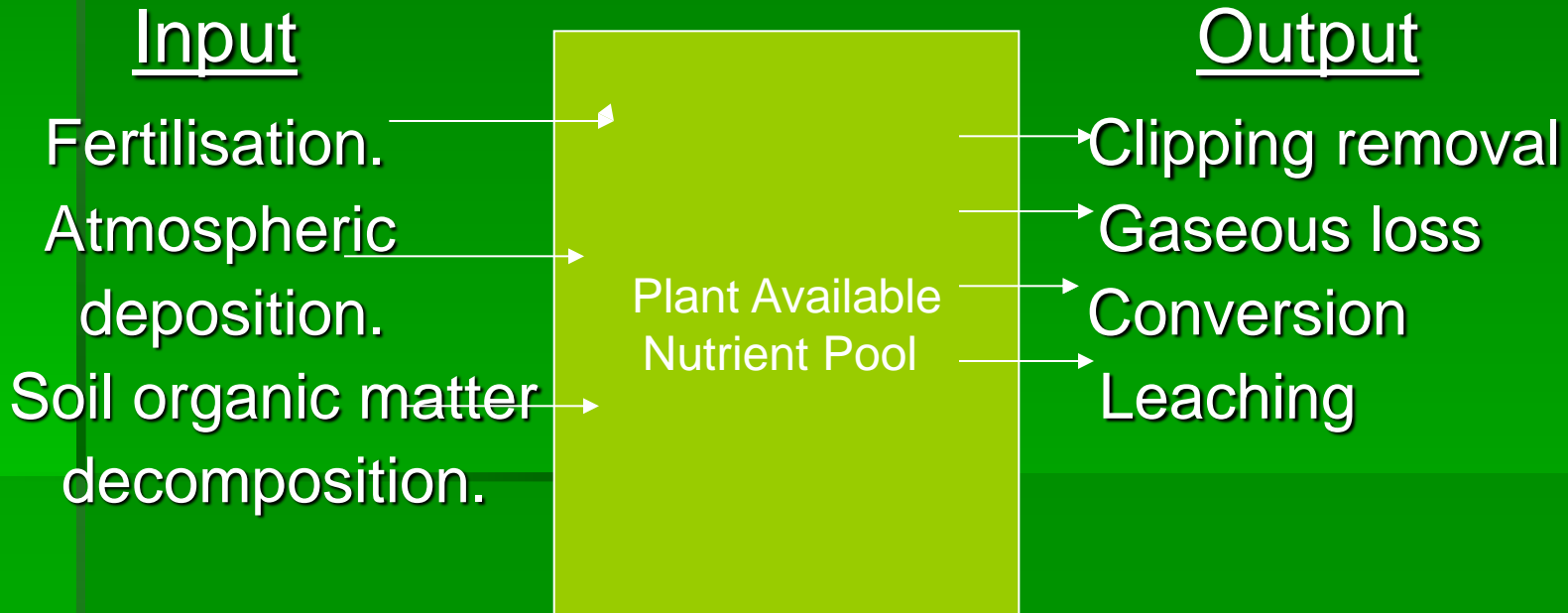
LIEBIG'S LAW

Law of the Minimum

Plant growth is constrained by the essential element that is most limited.



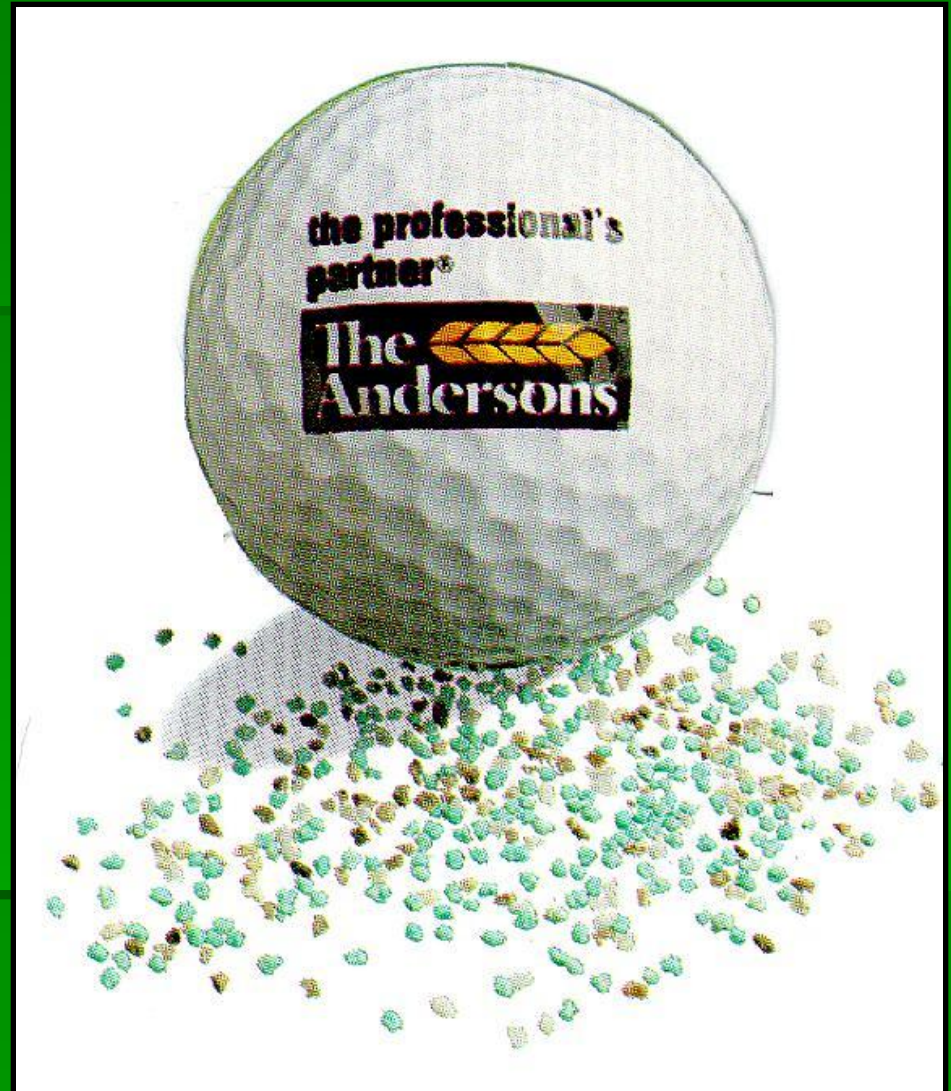
Where Do Nutrients Go?



Granular Fertilisers

Particle Sizing & Uniformity

SIZE really
does matter!



Granular Fertilisers

- Particle Sizing / Uniformity
 - SGN 100, etc
 - uniformity reflects spreadability
 - uniformity is the relationship between the largest particle and the smallest, the goal is to have identical spreading characteristics

Size Guide Number (SGN)

Size Guide Number

is the “average particle diameter” of the product expressed in millimeters multiplied by 100.

For Example:

A product with an average particle size of 1.5mm will have an SGN of 150.

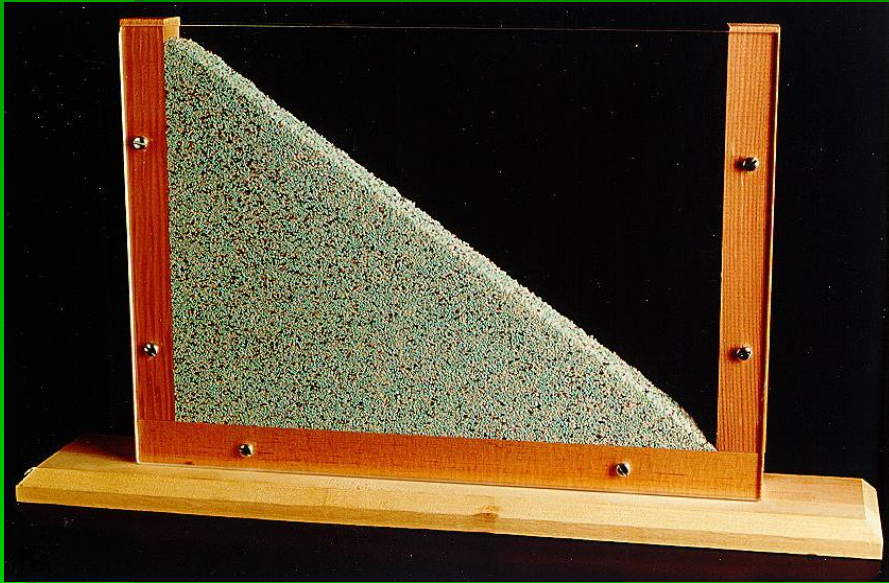
The lower the SGN number, the smaller the particle size.



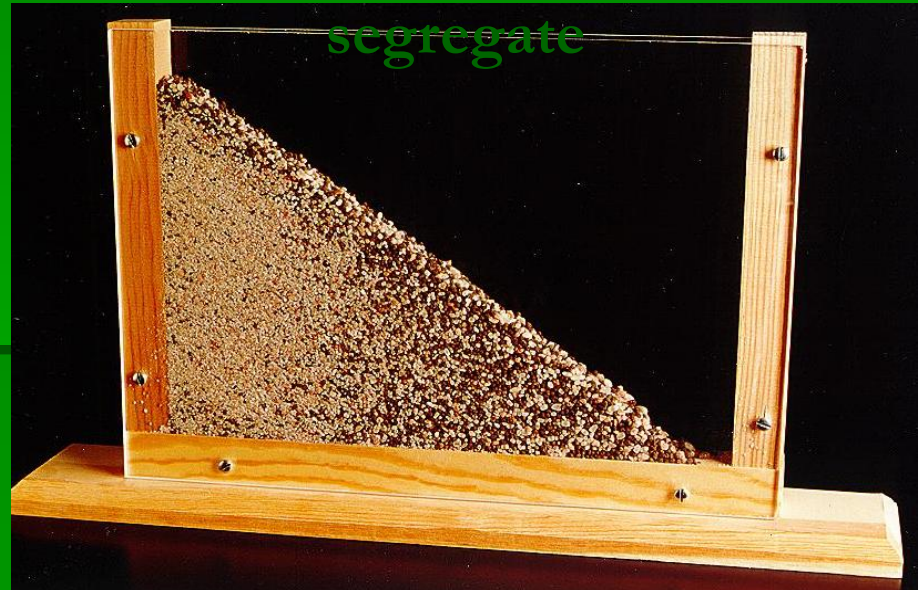
Uniform Particle Distribution

Segregation Analysis

Evenly sized particles
remain consistent



Multi sized
particles

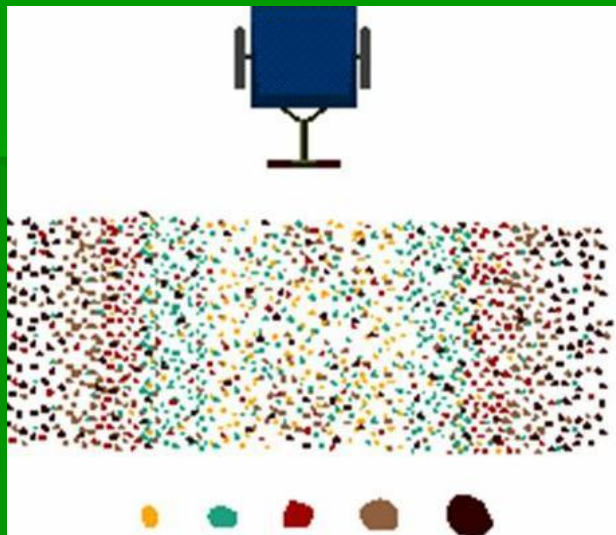


Uniform Particle Distribution

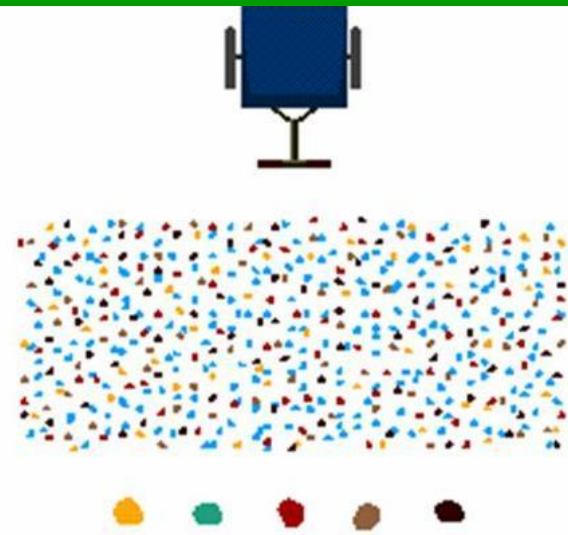
Spreadability

Varying particle sizes and density cause irregular ballistic behavior resulting in inconsistent delivery of product.

Non-Uniform Blend



Uniform Blend



Uniform Particle Distribution

Spreadability

Non-Uniform Product

Uneven Particle Distribution

Uniform Product

Uniform Particle Distribution



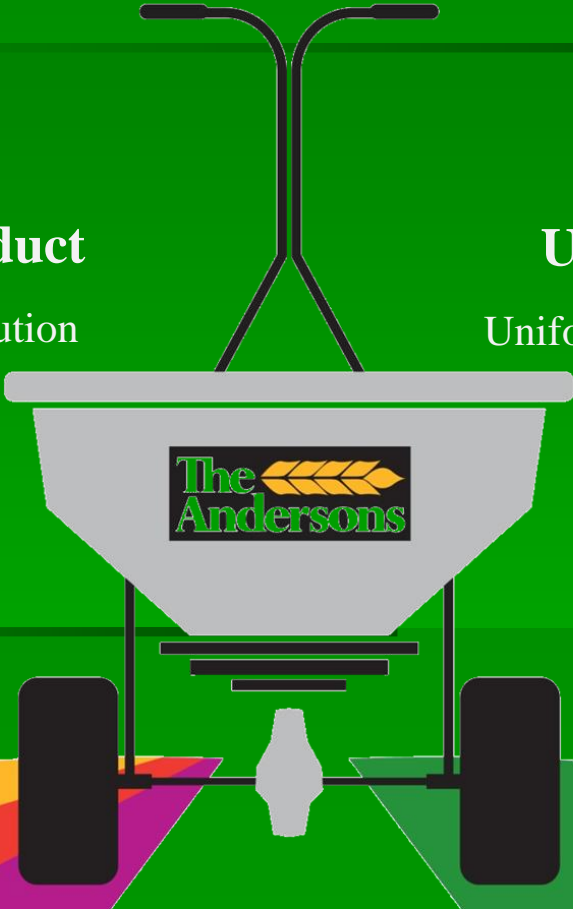
3.3 mm / 1.9 m



1.0 mm / 1.6 m



0.5 mm / 1.3 m



Uniform Particle Distribution

Summary

- The more consistently sized the product particles, the more evenly the product will be distributed and the more effectively it will perform.
- This is the first step in assuring *Uniform Particle Distribution which results in consistent coverage and maximum performance.*

- **HOMOGENOUS** – means that all the nutrient declared in the analysis are present in each and every granule
- **BLENDED** – means that all the nutrient declared in the analysis are present in individual granules, blended together in the mix

Turfgrass Nutrition

- Plants require at least 16 elements to sustain maximum growth and development

ESSENTIAL PLANT NUTRIENTS

Nutrient Symbol

Basic Nutrients

| | |
|----------|---|
| Carbon | C |
| Hydrogen | H |
| Oxygen | O |

Secondary Nutrients

| | |
|-----------|----|
| Calcium | Ca |
| Magnesium | Mg |
| Sulfur | S |
| Silicon | Si |

Nutrient Symbol

Primary Nutrients

| | |
|------------|---|
| Nitrogen | N |
| Phosphorus | P |
| Potassium | K |

Micronutrients

| | |
|------------|----|
| Iron | Fe |
| Manganese | Mn |
| Zinc | Zn |
| Copper | Cu |
| Molybdenum | Mo |
| Boron | B |
| Chlorine | Cl |
| Sodium | Na |

Basic Elements

- All plants require carbon, hydrogen and oxygen
- > Plants gather carbon in the form of carbon dioxide from the air during photosynthesis
- > Plants sequester hydrogen from water
- > Plants obtain oxygen from the air

Macronutrients

- Turfgrass must obtain six nutrients in relatively large amounts from the soil

- > Primary nutrients

Nitrogen, Phosphorus & Potassium

- > Secondary nutrients

Sulfur, Magnesium & Calcium

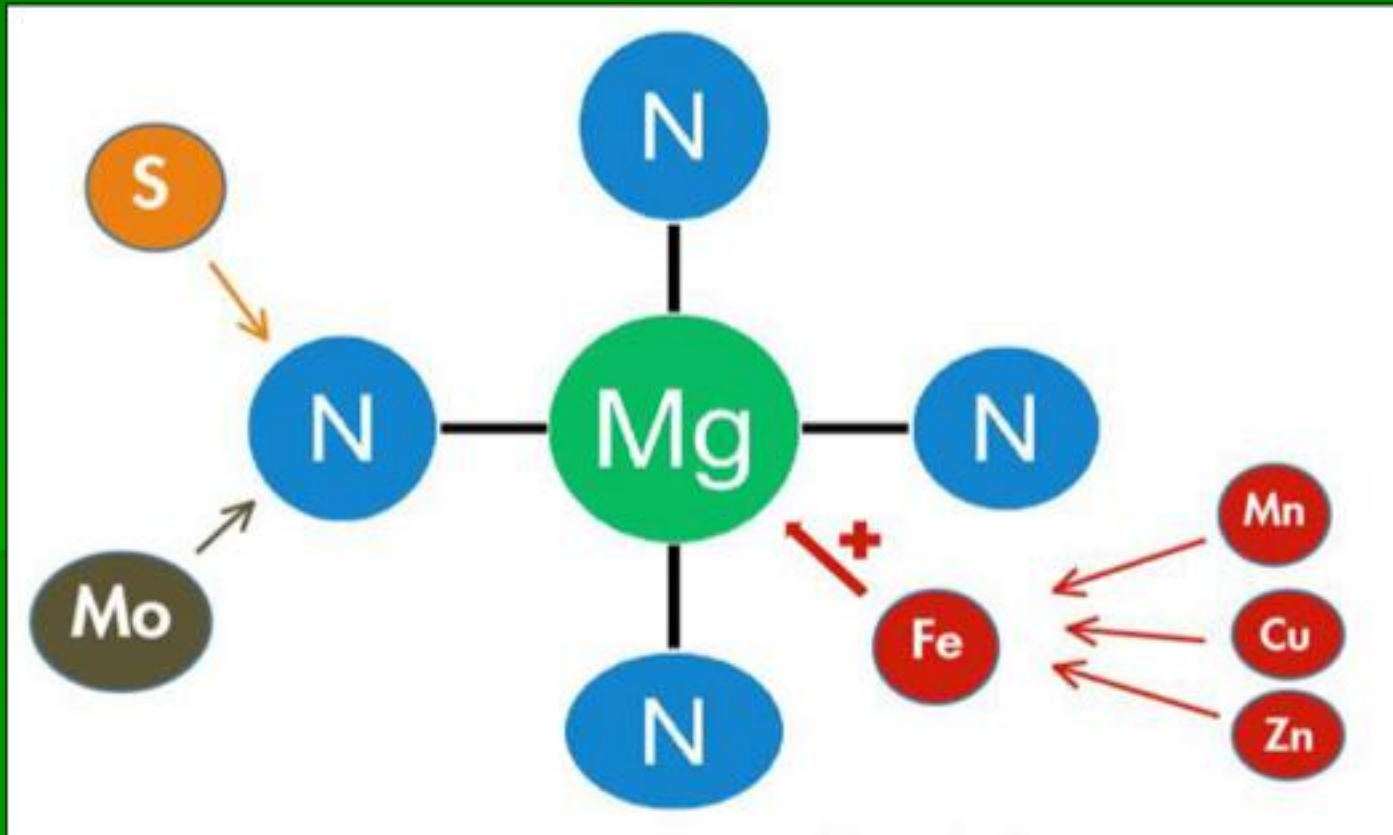
Micronutrients

- Turf must also obtain at least seven other nutrients in relatively small amounts from the soil
 - > Iron
 - > Manganese
 - > Zinc
 - > Copper
 - > Boron
 - > Molybdenum
 - > Chlorine

Which Nutrients have the Greatest Impact on Turf?

- Greatest:
 - Nitrogen (N)
 - Phosphorus (P)
 - Potassium (K)
 - Iron (Fe)
- Lesser extent:
 - Mg, Ca, S

Chlorophyll molecule



Nitrogen Sources

- Standard (fast) Release.

- > Urea

- > Ammonium sulphate

- > Potassium sulphate

- > Ammonium nitrate

- > Potassium nitrate

Standard (fast) Release

■ Advantages:

- > Quick acting
- > Low cost
- > Granular forms are easily spread as opposed to powders

■ Disadvantages:

- > May over stimulate growth
- > High salt index
- > Cost and/or inconvenience of repeated applications

Standard (fast) Release

- To minimize fert burn potential:
 - > use low rates
 - > apply to dry turf, to avoid fert sticking to the leaf
 - > water in

Nitrogen Sources

- Phased (slow) Release.

- >MU – methylene urea

- >PRC – polymer resin coated

- >PSCU – polymer sulphur coated urea

- >MESA – meth ex sulphate ammonia

Phased Release

- Advantages:

- >longer lasting
- >fewer applications required
- >lower leaching losses
- >lower salt index

- Disadvantages:

- >higher cost
- >N availability dependant on environmental factors
- >recovery may be low

GRASS BREEDING : A Time-consuming Process

