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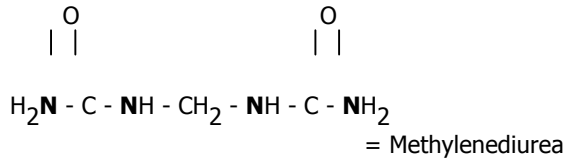
SICO METHYLENE UREAS

Controlled Nitrogen Release
Product Group Characteristics

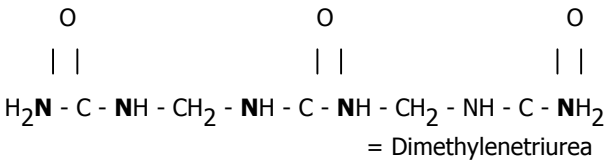
SICO has developed and is marketing a group of methylene-urea based organic controlled release nitrogen products.
By a specific condensation technology it is possible to produce polymeric nitrogen defined by specific ratios of methylene-urea polymers. The different chain lengths of these polymers define the slow release character of the single product.
SICO is one of the leading companies marketing three different basic products based on methylene-urea polymers with specific slow release nitrogen characters. Based on three basic pure methylene-urea products, different granulated, respectively blended slow release fertilizers can be formulated.

Biological degradation

The specific methylene-urea polymers are formed by:



= Methylenediurea



= Dimethylenetriurea

or higher methylene-ureas (Trimethylene-tetraurea, etc.)

A small amount of pure urea (4-5 %) is directly available for plant nutrition. All the nitrogen bound in the methylene-urea polymers is finally released by a microbial "cracking" process. Since microorganisms are required to break down the methylene-urea polymers, factors such as soil temperature, moisture and aeration affect the nitrogen release. As microbial activity is high when the growing conditions for plants and turf are favourable, the nitrogen release from methylene-urea is perfectly matched to the nutritional demand of the crop. This guarantees high nitrogen utilization by plants.
By varying the polymer composition (different ratios of polymer chain lengths), the different methylene-urea products can be adapted to the nitrogen needs of specific crops as turf and vegetables.

Diversity of SICO's methylene-urea technology: An extremely versatile system

According to the condensation technology methylene-urea polymers with different solubility are achieved:

* Cold water soluble methylene-urea
  - offers a boost at the start of the growing season (up to 6 weeks)
* Hot water soluble methylene-urea
  - offers a release over a longer period (up to 16 weeks)
* Hot water insoluble methylene-urea
  - offers a release over an extended period (up to 12 months)

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Agronomic performance

The range of different methylene-ureas offers excellent agronomic performance under a wide range of climatic conditions. The short-chained methylene-ureas are particularly indicated under cool and warm conditions, long-chain methylene-ureas are more widely used in warmer climates such as the southern and southwestern USA and around the Mediterranean.

Factors affecting N-release patterns form methylene-ureas

The rate of N-release from methylene-ureas like all biological processes is influenced mainly by temperature and to a limited extent by humidity. In contrast to IBDU (Isobutylidenediurea) the influence of pH-value and granule size on the mineralization of methylene-urea is negligeable.
Therefore, even powder formulations maintain the same controlled release characteristics as the granular forms.

Fields of application

1.Turf, public green, sports fields

For the controlled uniform nutrient supply of turf growing in periods or regions with particularly warm and humid soil conditions or soil profiles with particular high sensibility to nitrogen leaching._Ideal for seed beds and laying sods.
Excellent for being combined in fertilizer management programmes.

2. Vegetable growing

As a substrate additive when growing vegetable seedling and for the nutrient supply of greenhouse and outdoor vegetable cultivation.

3 Fruitgrowing

For the controlled nutrient supply to strawberries, fruit trees and tropical fruit crops.

4. Tree nurseries, landscape, ornamentals

The benefits of SICO's Methylene-Urea-Technology

* Assure nitrogen nutrition in an efficient, sustained manner.
* Different release patterns adapted to the crop's requirements, with and without residual effect.
* Biological release mechanism; build-up of biological activity in the soil.
* Excellent plant response to a wide spectrum of climatic conditions.
* Safe to use on recommended crops, low salt index (10 - 25).
* Environmentally sound as resistant to leaching and volatilization.
*Accelerated decomposition of thatch.
* Reduced clipping yields.
* Labor saving.

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