



Panel discussion on innovations in the field of enhanced-efficiency fertilizers

*IFA workshop
Frankfurt
June 2005*

The target: highest nutrient efficiency

Definitions:

biologic / ecologic: $\frac{\text{N uptake fertilized} - \text{N uptake unfertilized}}{\text{fertilization}}$

agronomic: $\frac{\text{yield fertilized} - \text{yield unfertilized}}{\text{fertilization}}$

economic: $\frac{\text{value yield fertilized} - \text{value yield unfertilized}}{\text{costs fertilization}}$

Optimized biologic / ecologic efficiency usually in line with an optimized agronomic and economic efficiency !



The challenges: losses / suboptimal growth factors

Undesired losses of Nitrogen:

- Leaching**
- Volatilization**
- Denitrification**
- Immobilization**
- Lacking availability of other nutrients**

Losses / unavailabilities to be minimized by:

- 1. Conventional fertilizers / special application methods (tools)**
- 2. Enhanced efficiency fertilizers / conventional application methods (products)**



Folie 3

O/CP_CPP_CPA/EAK/11_12052005

The tools: specific application methods

Application methods / other treatments:

- Spoon feeding according to short term demand**
- Incorporation**
- Placement / Injection**
- Aerification**
- Corrections of soil properties (structure, pH...)**

**Using conventional
fertilizers**

**These tools require a high analytical, manpower and machinery input
and / or can only be used before planting !**



Folie 4

O/CP_CPP_CPA/EAK/11_12052005

The products: enhanced-efficiency fertilizers

Enhanced efficiency fertilizer technologies:

Nitrification inhibitors (DCD, DMPP...)

Urease inhibitors (NBPT...)

SRFs based on Urea condensates (MU, IBDU, CDU...)

Polymer coated CRFs (Polyethylene, Polyurethane...)

Chelated trace elements (EDTA, EDDHA, DTPA...)

**Using conventional
application methods**

All products can be used during the vegetation cycle of any crop !



Folie 5

O/CP_CPP_CPA/EAK/11_12052005

The solutions: targeted use of fertilizer technologies

Life cycle perennial crop and adapted use of enhanced-efficiency fertilizers

Nursery / planting hole: Fully coated complex fertilizer into substrate

One application

Safe

All required nutrients

Minimized losses

Vegetative development: N(PK) topdressing with nitrification inhibitor

Few applications solid / liquid

Minimized leaching / denitrification

Improved availability of P / TE

Productive period:

Chelated TE in case of deficiency

Targeted use

Leaf or soil application

Small volumes

Highest efficiency



Folie 6

O/CP_CPP_CPA/EAK/11_12052005