



Technical Committee



# Microplastics in fertilizers

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ECHA Stakeholder Workshop

on intentional use of  
microplastic particles

# Polymers' function in fertilizers

## 1. Coating for CRF

- Polyurethanes
- Poly(ethylene co vinylacetate)
- Ethylene acrylic acid copolymer
- Formaldehyde-naphtalensulfonic acid condensate sodium salts
- Alkyds based on vegetable oils
- Etc. (confidential information)

## 2. Anticaking agents

- Polyethylene based additives
  - Polyolefin waxes
- Etc. (confidential information)

# 1) Controlled release fertilizers (CRF)

**Polymer Coated products:** Release by diffusion of water (vapor) through coating. Release through Osmotic pressure



## Strengths:

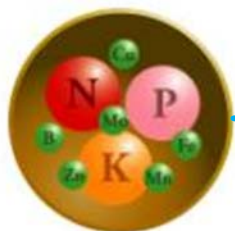
- Control over release
- Adjustment to the plants' needs

## Weakness:

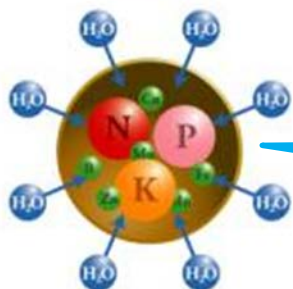
- Higher cost coating

**Definition of CRF:** *Fertilisers in which nutrient release is controlled, meeting the stated release rate of nutrient and the stated release time at a specified temperature (ISO 8157:2015)*

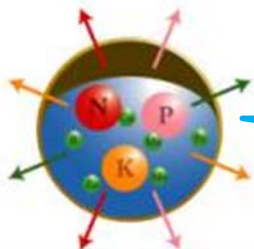
# Release Mechanism



Release mechanism explained for coated NPK+trace element granule



Water (vapor) penetrates through coating and start dissolving nutrients and creates osmotic pressure



Nutrients dissolve and highly concentrated nutrient solution is pushed out continuously over time due to osmotic pressure



After release of all nutrients generally coating fragments and very slowly degrades

# Agricultural uses

## Ornamental uses



Mixed through  
growing media

## Turf and landscape



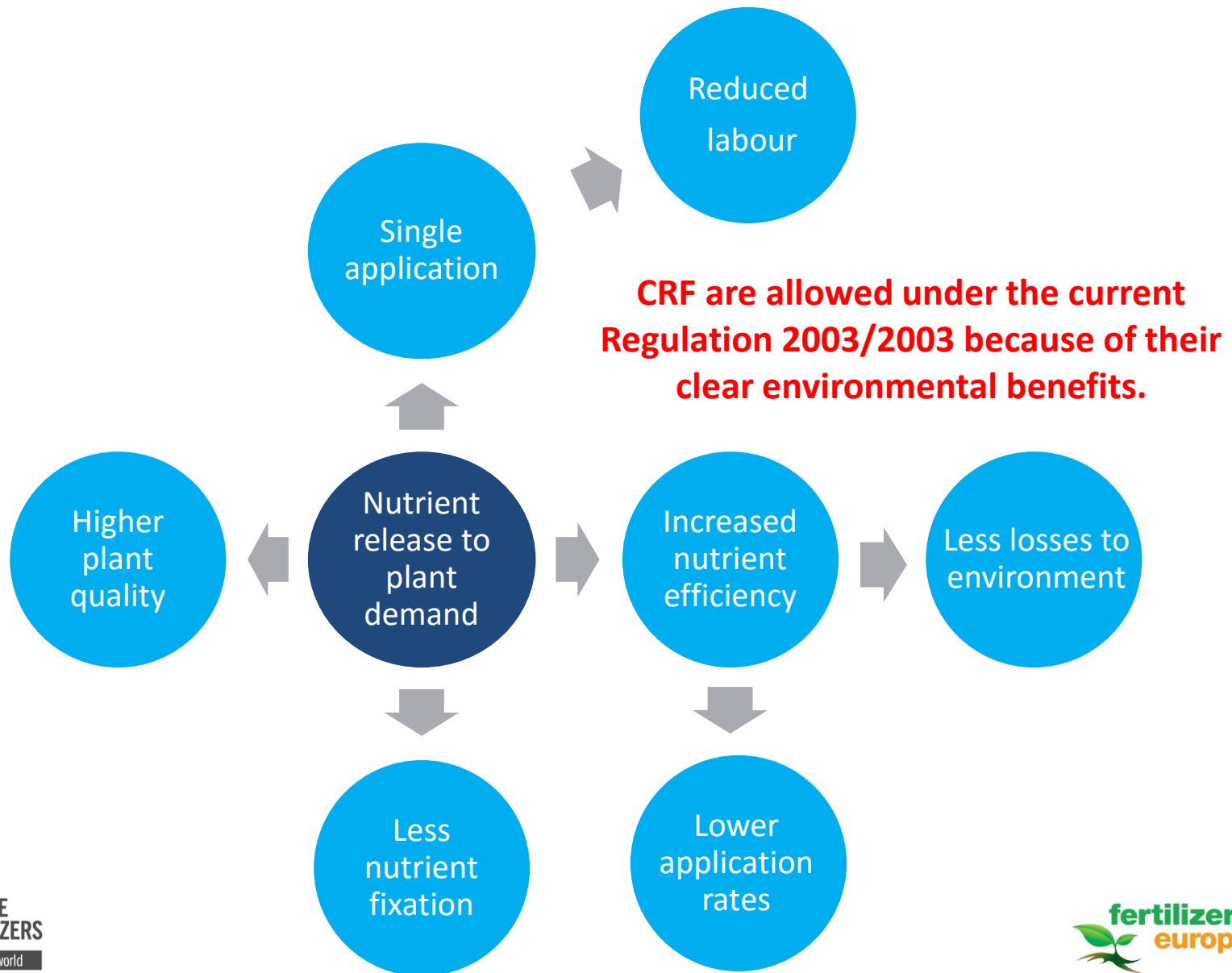
Sports and golf  
fields

## Agriculture and forestry



More complex  
because of  
variability

# Technical function



# Pathways for releases to the environment

Polymers remain in the environment after nutrients have been released, however the quantity of microplastics present is very limited.


Rough estimates:

- 1000-2000 t/y of coating agents

# CRF – Alternatives?

 Today :

- biodegradable polymers used for CRF (e.g. used for mulching foils) lack the right barrier properties for water and are extremely difficult to apply around mineral fertilizers
- No viable solution so far
- Not considering oxo-degradable coatings as an option

 Foreseen solution for the new fertilizers Regulation: **5 years** to develop a biodegradability test and corresponding biodegradability criteria



# Other impacts

- Costs for developing testing methods, field studies and developing appropriate standard
- Timescale: no crystal ball
- More challenges to get new technologies into agriculture

## 2) Anticaking agents

**Anticaking agents** prevent the formation of caking for nutrient salts and granulated NPK fertilizers



Source: filtra exim pvt ltd



# Pathways for releases to the environment

Polymers remain in the environment after nutrients have been released, however the quantity of microplastics present is very limited.

Still collecting more information from our members

# Anticaking agents – Alternatives



# Thank you

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