Nano Agro Products

(Nanotechnology: The Gateway to Zero Carbon Emissions)

Nano-fertilizers and Nano-pesticides

A product of



Dept. of Chemical Engineering Jashore University of Science and Technology

www.namelab.org

Nano-Urea Liquid

(25% Nitrogen as Nano form)

(Nanotechnology: The Gateway to Zero Carbon Emissions)

Bottling size: 500 ml (equivalent to 50 kg conventional Urea) **Dose:** 3-5 ml/L need to mix with fresh water

Cost comparison:

50 kg conventional urea price: **4250 TK** 500 ml Nano-Urea liquid cost: **230 TK** Efficiency: **> 90%** and **Zero (O)** carbon emission

Chemical Availability

□ All chemicals are locally available.

Production Requirements for 10000 L/batch

- □ Mixer machine with heating system: 15000 L capacity
- Rotary dryer: 10000 L capacity
- □ Autoclave Teflon lined: 10 L capacity
- □ High-Speed Homogenizer: 15000 L capacity

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Nano-Urea Powder

(Nano size powder Urea)

(Nanotechnology: The Gateway to Zero Carbon Emissions)

Benefit: Can save 75% commercial Urea **Dose:** Same as farmer practice

Cost comparison:

kg conventional urea price: 90TK
kg Nano powder Urea cost: 30 TK
Cost effectiveness: > 66% and lowest carbon emission

Chemical Availability

□ All chemicals are locally available.

Production Requirements for 10000 L/batch

- □ Mixer machine with heating system: 15000 L capacity
- Rotary dryer: 10000 L capacity
- □ Autoclave Teflon lined: 10 L capacity
- □ High-Speed Homogenizer: 15000 L capacity

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Nano-Gold

(All nutrients in Nano form)

Benefits: Production increase at least 30%

Bottling size: 100 ml **Dose:** 3-5 ml/L need to mix with fresh water **Yield:** Production yield increase at least 30%

Raw material Cost: 100 ml: 35 TK

Chemical Availability

□ All chemicals are locally available.

Production Requirements for 10000 L/batch

- □ Mixer machine with heating system: 15000 L capacity
- □ Autoclave Teflon lined: 10 L capacity
- □ High-Speed Homogenizer: 15000 L capacity
- □ Centrifuge machine: 100 L capacity
- □ Sonication machine: 100 L capacity

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Nano-Zeolite

(Smart Soil Enhancement)

Benefits: Production increase at least 30%

Bottling size: 1 kg **Dose:** 10% of the commercial zeolite (90% save)

Raw material Cost: 250 TK/kg

Chemical Availability

□ All chemicals are locally available.

Production Requirements for 1000 kg/batch

- □ Mixer machine with heating system: 1500 L capacity
- □ Calcination Furnace (500–600°C): 500 L capacity
- □ Centrifuge machine: 100 L capacity
- □ Sonication machine: 100 L capacity

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Nano-Hydroxyapatite (Advanced Phosphorus Solution)

Benefits: Production increase at least 30%

Bottling size: 1 kg **Dose:** 10% of the commercial hydroxyapatite (90% save)

Raw material Cost: 450 TK/kg

Chemical Availability

□ All chemicals are locally available.

Production Requirements for 1000 kg/batch

- □ Mixer machine with heating system: 1500 L capacity
- □ Calcination Furnace (500–600°C): 500 L capacity
- □ Centrifuge machine: 100 L capacity
- □ Sonication machine: 100 L capacity

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Non-Ionic Surfactant (Important additive in pesticide application)

Benefits: Improve pesticide efficiency up to 50%)

Bottling size: 100 ml **Dose:** As required

Raw material Cost: 250 TK/L

Chemical Availability

□ All chemicals are locally available.

Production Requirements for 1000 L/batch

- □ Mixer machine with heating system: 1500 L capacity
- □ Centrifuge machine: 100 L capacity
- □ Sonication machine: 100 L capacity

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Nano-Carrier for Pesticides (Efficient and Effective Pesticide Delivery)

Bottling size: 10 gm

Benefit: Controlled release performance can save up to 50% of pesticides use.

Raw material Cost: 25 TK/g

Chemical Availability

□ All chemicals are locally available.

Production Requirements for 1000 kg/batch

- □ Mixer machine with heating system: 1500 L capacity
- □ Calcination Furnace (500–600°C): 500 L capacity
- □ Centrifuge machine: 100 L capacity
- □ Sonication machine: 100 L capacity

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Nano-Carrier for Pesticides (Efficient and Effective Pesticide Delivery)

Name: Zinc cobaltite ZnCo₂O₄

Benefits:

- **Carrier for pesticide delivery**
- **D**egrades pesticide residues

Name: Zinc ferrite ZnFe₂O₄

Benefits:

- □ Controlled release
- □ magnetically guided

Name: Silica-magnetite hybrid SiO₂-Fe₃O₄

Benefits:Herbicide carrierFungicide carrier

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Nano-Vita (All vitamins in Nano form)

Benefits: Production increase at least 30%

Bottling size: 100 ml **Dose:** 3-5 ml/L need to mix with fresh water **Yield:** Production yield increase at least 30%

Raw material Cost: 100 ml: **35 TK**

Chemical Availability

□ All chemicals are locally available.

Production Requirements for 10000 L/batch

- □ Mixer machine with heating system: 15000 L capacity
- □ Autoclave Teflon lined: 10 L capacity
- □ High-Speed Homogenizer: 15000 L capacity
- □ Centrifuge machine: 100 L capacity
- □ Sonication machine: 100 L capacity

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