

N-GUARD

Nitrification Inhibitor

A large percentage of the Nitrogen in nitrogenous fertilizers such as Urea is lost due to the action of nitrifying bacteria and ammonification. This leads to low fertilizer use efficiency, over and above which, this also proves to be an underground environmental hazard as the nitrogen leaches into the ground water.

When Urea is applied to the soil only approximately 33% is actually utilized by the plant. After application to soil, urea hydrolyses rapidly to ammonium carbonate. This ammonical form of Nitrogen is subsequently converted to nitrite (NO_2) and then to nitrate (NO_3) by the action of nitrifying bacteria viz. *Nitrosomonas spp.* and *Nitrobacter spp.*, respectively. The processes of hydrolysis and nitrification of Urea fertilizer are to a large extent completed in about 15-20 days under most conducive agro climatic conditions. Since the duration of most cultivated crops extends beyond 90-100 days, nitrates formed as a result of the relatively rapid hydrolysis and nitrification of Urea, being highly soluble, and in excess of the limited quantities required by the crops at their early stages of growth, are liable to be leached down, beyond the active root zone of crops. Therefore apart from being directly responsible for a huge monetary loss, it is also an underground environmental hazard through nitrate leaching and ammonification. This gives rise to ground water contamination which poses a serious threat to the environment and human health. However, this problem can be considerably alleviated by treating such nitrogenous fertilizers with N-GUARD

In order to ensure continuous and optimal supply of Nitrogen to match the requirements of crops at different stages of growth it is necessary to regulate the Nitrogen supply to crops by slowing down the rate of hydrolysis or nitrification or both.

The antibacterial properties of Neem have been found to help nitrification inhibition. In this context, significance of Neem in increasing fertilizer Nitrogen efficiency has been studied extensively. Results of the effect of Neem coating or blending of prilled Urea available from a large number of experiments on several crops, including rice in which losses of nitrogen are reported to be maximum, reveal that increase in rice yield due to Neem coating/blending of prilled urea ranged from 0.9 to 54.2% and the average value was 9.6%. (Ref. NEEM Research and Development) The average increase in the yield of wheat, potato, sugarcane, cotton and finger millet was 6.9, 10.5, 15.5, 10.3 and 5.3%, respectively. Other crops also show an increase in yield due to use of Neem along with urea.

N-GUARD is a Neem limonoids and Neem bitters based formulation which helps maximize the Nitrogen Use Efficiency of nitrogenous fertilizers like Urea, while minimizing the loss of Nitrogen by virtually eliminating the risk of volatility, nitrification and leaching. The *Epinimbin* in N-GUARD has maximum nitrification inhibition potency followed by *Desacetylnimbin*, *Salannin*, *Desacetylsalannin*, *Azadirachtin* and *Nimbin*.

Advantages of using N-GUARD:

- It helps to increase the fertilizer use efficiency (FUE) of nitrogenous fertilizers.
- It reduces the nitrification rate by curbing the activity of nitrifying bacteria such as *Nitrosomonas* and *Nitrobacter* which ensures controlled release and continuous availability of Nitrogen to the crop during its critical stages of growth.
- It helps in reducing the loss of Nitrogen through ammonia volatilization, nitrate leaching and other similar processes.
- It helps plants to increase their Nitrogen uptake.
- It helps in controlling the soil borne insect-pests and nematodes.
- It potentially increases crop yield
- It helps farmers to cut down the use of Urea by up to 25 %

Effect of **N-GUARD** (Natural Nitrification Inhibitor) in increasing the yield of chillies (var. Namdhari NS 1707). Experiment conducted at the company’s research farm in Dakor

Table: 1

Sr. No.	Treatment	Yield Kg/ ha (3 pickings)	% increase over control
1.	Normal Urea	944	
2.	N-Guard Coated Urea	1654	75.21
3.	N-Guard Coated Urea (25% reduced dose of Urea)	1470	55.72

The above results indicate that the use of N-Guard significantly helped in

increasing the yield of chillies (based on three pickings).

N-Guard Coated Urea recorded 75.21% increase in yield over Normal Urea

and

N-Guard Coated Urea (25% reduced dose of Urea) recorded 55.72% increase in yield over Normal Urea.

Conclusion: Farmers can cut down the use of Urea by 25%, if they use N-Guard and can also get higher yield

Active Ingredient:

Neem limonoids

Mixing methods and Dosage:

Liquid Fertilizers

N-GUARD can be mixed with liquid fertilizers such as Aqua Ammonia or other liquid ammonical or Urea Nitrogen composition. To make a stable emulsion, N-GUARD should be added to liquid fertilizer with constant agitation. Apply the mixture to the field as normal.

500ml – 1 litre / acre

Granular Ammonium and Urea

N-GUARD can be coated on most dry ammonical fertilizers or blends containing ammonical fertilizers, by mixing it in a closed rotary drum mixer. Apply this N-GUARD coated fertilizer in the field as normal.

500 ml /100kg Urea

Tank Mixing

N-GUARD may be applied in tank mixtures. The mix can be in water or most Urea, Ammonium Nitrate & NPK solutions, slurries or suspensions. Check the compatibility of the mixture as indicated below. Maintain constant agitation during both, mixing and application to ensure uniformity of the spray mixture. In case agitation facility is not available; we can provide an emulsifier to facilitate N-GUARD solubility.

500ml – 1 litre / acre

Packaging:

1000 litres tank

200 litres barrel

5 litres carboy

1 litre plastic bottle

500 ml. plastic bottle

Storage:

Store in cool dry place away from direct sunlight

Shelf life:

2 years

Compatibility Test:

To test the compatibility of N-Guard with liquid fertilizer and/or herbicide mix, add a proportionate amount of each ingredient to a small jar. Close the jar, shake and let the mixture stand for 15 to 20 minutes. Formation of precipitates or layers that do not readily re-disperse indicates incompatibility and should not be used.