



# LIQUIFERT N

%N	%P	%K	%S
46	0	0	0

## ANALYSIS

### Nutrients

- Nitrogen (N) as Urea 46%
- (Crude Protein 287.5%)

### Impurities

- Biuret 1.4% (max)
- Cadmium (Cd) 1 mg/kg Cd (max)
- Lead (Pb) 1 mg/kg Pb (max)
- Mercury (Hg) 0.2 mg/kg Hg (max)
- Fluorine (F) 100 mg/kg (max)

## DIRECTIONS FOR USE

Liquifert N is a urea fertilizer. It has a smaller granule size than Incitec Pivot Fertilisers Granular Urea, making it easier to dissolve.

Liquifert N is intended for application in solution as a fertiliser (mainly through fertigation systems, but also as a foliar spray in cereal and broad-acre field crops), and in the preparation of stock licks for ruminants (for use as a non-protein nitrogen supplement).

Liquifert N is not recommended for repeated foliar application on annual or perennial horticultural crops. A low biuret grade of urea (Liquifert Lo-Bi) should be used in these circumstances. Refer to the Liquifert Lo-Bi Use Directions for more detail.

### Fertigation

Liquifert N can be applied by fertigation (dissolved in irrigation water) through surface (flood-irrigated), overhead, sprinkler and drip or trickle irrigation systems.

Fertigation provides a convenient and labour-saving means of fertiliser application and allows nitrogen requirements to be split during the growing season. Fertigation nitrogen rates will be similar to rates applied dry to the soil.

Tail-water from irrigated fields in which fertigation is practiced should be kept on farm or recycled and not be allowed to enter streams.

## Foliar Sprays

Liquifert N contains up to 1.4% biuret, an impurity that is formed during the manufacture of urea. Biuret is not metabolised in plant leaves. When applied repeatedly in foliar sprays, particularly in long-lived evergreen perennial crops such as citrus, the biuret will accumulate in the plant leaves and may reach toxic concentrations.

Liquifert N is **not** recommended for **repeated** foliar application on **annual** or **perennial horticultural crops**. Liquifert Lo-Bi, a low biuret grade of urea, should be used in these circumstances. Liquifert N may be used where a single foliar spray is made in short season annual crops, e.g. cereals, cotton, other broad-acre field crops, and in vegetables.

A single annual spray of Liquifert N may be used at low rates in deciduous tree and vine crops. The use of a low biuret grade of urea should be considered if the urea is to be applied at high rates, and the crop is sprayed every year.

Urea is often added at low rates to the spray tank when foliar sprays of other fertilisers, e.g. trace elements, are being prepared. The addition of urea to the spray mixture promotes leaf uptake of other nutrients. There is generally no need to use Liquifert Lo-Bi in these circumstances. Liquifert N can be used, even if more than one spray is made to horticultural crops, as the urea is being used at low rates as a spray adjuvant, not at the higher rates customarily used as a nitrogen fertiliser.

More specific Use Directions follow.

## Use of Liquifert N as a foliar-applied nitrogen fertiliser in cereal and broad-acre field crops

Foliar sprays of urea can be used to supplement, but not replace soil applications of nitrogen fertiliser. There are limits to how much fertiliser can be foliar applied without burning the foliage, which may happen if urea is applied at too high a rate, or too frequently.

- In **winter cereals**, a single application of Urea at 20 – 30 kg/ha, e.g. a 20 – 30% solution at 100 L/ha, can be applied at mid-tillering. This may cause some leaf scorch but should have no lasting effects.
- In **cotton**, several sprays of a 10 – 15% urea solution may be made during the growing season.

Add a non-ionic wetting agent at label recommended rates.

If urea is used in conjunction with other fertilisers in multi-nutrient foliar sprays, e.g. potassium nitrate, it may be necessary to reduce the amount (concentration) at which the different fertilisers are applied, to ensure that the combined fertiliser rate is not excessive.

Many factors affect the susceptibility of crops to foliar burn, including the type of crop being grown, its growth stage, prevailing weather conditions, the time of day that the fertiliser is applied, spray

concentrations and volumes, frequency of application, water quality and application equipment. Because of the many variables involved, the maximum rate at which urea can be safely applied varies and cannot be accurately predicted in advance. The expression of symptoms may vary from year to year, week to week, and farm to farm. Burn may occur under both lush and harsh growing conditions.

If intending to foliar-apply urea for the first time, or applying to a new crop, or in combination with other fertilisers, or should application procedures and equipment change, test spray a small area beforehand, and observe the crop for three to four days for signs of phytotoxicity, before spraying the remainder of the field.

The best time to spray is usually in the early morning. Sprays can also be applied in the late afternoon or evening, or under cloudy conditions, provided the temperature is low and humidity is high. Do not spray in the heat of the day, particularly in summer, when evaporative conditions are at their highest.

**Note:** Nitrogen is applied at higher rates than those detailed above as EASY N (Urea Ammonium Nitrate) in cereal crops. EASY N is applied through coarse streaming nozzles, so that a lot of the spray solution runs off the leaves onto the soil, from where the nitrogen is taken up by the plant roots. This should not be confused with foliar sprays, in which finer nozzles are used to wet the leaves, without run-off to the soil. This maximizes the retention of spray droplets on plant foliage.

High volume sprays of urea and Sulfate of Potash are also used in pineapples. Again, much of the spray runs off the foliage to the soil, from where it is taken up by plant roots.

## Use of Liquifert N as an adjuvant to foliar-applied sprays of other nutrients

Where other fertilisers, e.g. trace elements, are to be foliar applied, add urea to the spray mix at:

- 1 kg/100 L (1% w/v) in field crops,
- 500 g/100 L (0.5% w/v) in vegetables, and
- 100 g/100 L (0.1% w/v) in tree crops;

plus a non-ionic wetting agent at label recommended rates.

A small amount of urea in the spray mix helps promote leaf uptake of other nutrients. It should not be necessary to use a low biuret grade of urea when urea is applied at these low concentrations and only a few sprays are made.

If nutrient sprays in which urea is used as an adjuvant are to be applied regularly in high value horticultural crops through the growing season, e.g. with weekly crop protection sprays, the use of a low biuret grade of urea, e.g. Liquifert Lo-Bi, should be considered.

## Stock Licks and Grain Rations

Liquifert N may be used in stockfeed supplements, e.g. molasses licks, for ruminants during the dry season, i.e. when pasture quality declines. Cattle should be introduced to urea slowly, feeding 15 g/day initially, and increasing it by this amount weekly, until a rate of 60 g/day is reached.

Urea is poisonous if fed in excessive quantities, or too quickly. Plentiful roughage should be available. Do not feed urea supplements to starving stock.



Liquifert N can also be used as a non-protein nitrogen source when preparing grain rations for drought feeding and feedlots. Contact your local Department of Primary Industry or agriculture adviser, or an animal nutritionist for advice on the formulation of grain rations.

## MIXING, COMPATIBILITY IN SOLUTION

While urea will dissolve in its own weight of water, much lower concentrations are used in practice. The dissolution of urea in water is an endothermic reaction. It causes the temperature of the solution to fall as it dissolves. Consequently, it becomes increasingly difficult to dissolve urea as the concentration rises and the temperature falls. A practical solubility limit is 25 kg/100 L (25% w/v).

Heating the water, if it is practical to do so, will make the urea easier to dissolve if higher concentrations are required.

Urea is compatible in solution with most other fertilisers.

Fill the tank to near capacity, leaving space for the added fertiliser, which should then be added slowly while agitating. Do not pre-mix, as is the practice with many pesticides, e.g. wettable powders. The fertiliser will not dissolve completely if added to a small amount of water.

Urea solutions are alkaline, i.e. they have a high pH. The final pH of the spray solution will depend on the quality of the water, and what other ingredients are used. Many other fertilisers are acidic.

If necessary, the pH of the spray solution can be adjusted. The ideal pH for foliar sprays is 5.0 - 6.5. Solution grade MAP (monoammonium phosphate) fertiliser may be used as a buffering agent if the spray mixture is alkaline.

Fertiliser solutions should be prepared just prior to use, and not allowed to stand for an extended period. This will minimize any biological transformations to the urea while in solution. These are more likely to occur where muddy surface water is used. It also reduces the risk of sediment formation and settling in mixing and spray tanks, due to different fertilisers reacting with one another or salts in the water, e.g. where hard water is used.

In some crops where urea is applied at high concentrations, e.g. pineapples prior to flowering, the use of a bactericide is often recommended to prevent possible ammonia formation (and subsequent crop damage) from the action of bacteria on the urea.

Urea is compatible with most herbicides, insecticides, and fungicides. However, their compatibility with urea should be checked on the pesticide label before use. If compatibility information is not available, mix a small batch in a glass jar, and observe for signs of stability (settling or phase separation). It may also be necessary to spray a few plants and wait a few days to observe for signs of phytotoxicity and/or efficacy, before spraying the entire crop.

The chemicals should be added to the spray tank first, followed by the fertilisers. This helps minimise any pH changes and exposure of the chemical to high pH. Alkaline conditions affect many agricultural chemicals.

## CARE OF EQUIPMENT

Fertilisers can be corrosive to metals. Flush spray and fertigation equipment after use.

Where applied through fixed irrigation lines, discontinue use towards the end of the shift, to flush fertiliser from the lines and off crop foliage. This minimizes corrosion and the risk of leaf and fruit burn.

## FURTHER READING

Agritopics on “Nitrogen”, “Urea”, “Fertigation”, “Foliar Fertilisers” and “Ruminant Supplementation” are available if required and should be read in conjunction with these “Use Directions”.

## SAFETY DIRECTIONS

Refer to the Safety Data Sheet (SDS) for more detailed safety advice. Before use, read the Product Label and the SDS. Use safe work practices and avoid contact with the eyes and skin. Avoid ingestion and inhaling dust. Protective clothing, eyewear and dust masks should always be used when dealing with this product. Observe good personal hygiene, including washing hands after use. Avoid loss of fertiliser to waterways.

## WARNING

This document contains information of a general nature. Before using fertiliser seek independent agronomic advice. Fertiliser programs may need to be varied depending on the plants being grown, climatic and soil conditions, application methods, irrigation, agricultural and livestock management practices, the soil’s fertility, and cultural practices. (‘Unforeseen Elements’)

Fertiliser may burn and/or damage crop roots or foliage. Foliar burn to the leaves, fruit or other plant parts is most likely to occur when fertilisers are foliar applied at high concentrations and/or on a regular basis, different products are mixed and sprayed together at cumulatively high rates, the water is of poor quality, or the spray is applied under hot dry conditions, e.g. in the heat of the day.

Fertiliser and supplements may affect animal health. Seek independent advice before using any supplements in livestock rations.

## DISCLAIMER

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