USE DIRECTIONS

August 2021

EASY N

Urea Ammonium Nitrate (UAN)

Fertiliser Solution

%N	%P	%K	%S
42.5	0	0	0

ANALYSIS (Weight/Volume)

NUTRIENTS

- 21.5 % Nitrogen (N) w/v as urea
- 10.5 % Nitrogen (N) w/v as ammonium
- 10.5 % Nitrogen (N) w/v as nitrate
- 42.5 % Nitrogen (N) w/v Total (425 g/L N)

IMPURITIES

- Biuret (from Urea component) 1.0 % w/v (max)
- Cadmium (Cd) 1 mg/kg Cd (max)
- Lead (Pb) 1 mg/kg Pb (max)
- Mercury (Hg) 0.2 mg/kg Hg (max)

SPECIFIC GRAVITY

EASY N has a specific gravity at 20^0 C of 1.32. This gives EASY N an analysis on a weight/weight basis of 32 % N w/w (320 gN/kg).

EASY N

EASY N is a light blue coloured solution of urea and ammonium nitrate dissolved in water.

EASY N can be applied to the soil as is, i.e. neat, be diluted in water, e.g. with irrigation water (fertigation programs); or applied as a foliar spray in some crops. It can be applied alone as a nitrogen fertiliser or mixed with some other fluid or soluble fertilisers.

Before the addition of other fertilisers to Easy N, compatibility needs to be checked. Incorrect ratios of mixes or insufficient addition of water can cause dissolution.

EASY N should NOT be used as a “non-protein nitrogen” supplement for livestock, as it may cause nitrate poisoning.

EASY N contains a higher concentration of nitrogen (N) than can be obtained by dissolving either urea or ammonium nitrate on its own in water. Together their solubility is enhanced, allowing a concentrated nitrogen solution to be produced. One litre of EASY N (42.5 % N w/v) contains slightly less nitrogen than one kilogram of solid urea (46 % N w/w). (42.5w/v / 46w/w X 100 = 92.4% of Urea analysis).

EASY N has a pH of 6.0 – 7.0.

EASY N can be used instead of solid nitrogen fertilisers where it is more convenient to apply the fertiliser as a liquid rather than as a solid. Evenness of application across the boom width compared to spreading urea granules, application in wet or windy conditions and trafficking the same spray lines, are all benefits.

EASY N is popular where nitrogen is to be applied in solution, e.g. fertigation programs, as it avoids the need for bag handling and dissolving solid nitrogen fertilisers on farm.

It is very difficult to achieve the nitrogen concentration in EASY N if fertiliser solutions are prepared on farm, as both urea and ammonium nitrate cause the temperature of the fertiliser solution to fall as they are dissolve in water (endothermic reaction). EASY N takes the hassle out of preparing concentrated nitrogen fertiliser solutions on farm.

EASY N can be applied to the soil in the same way and at the same times as solid (dry) nitrogen fertilisers, provided equipment is available to apply it. The product can be applied pre-plant, at planting (away from the seed) or be side or top-dressed. It can be applied into the soil, or onto the soil surface.

If surface-applied, incorporation. e.g. by cultivation or irrigation shortly after application, will reduce the risk of volatilization losses of ammonia. Rain, e.g. 10 – 15 mm or more, depending on the amount of plant material on the soil surface, will also carry the fertiliser into the soil. Easy N (pH6-7) is less volatile (ammonia loss) than Urea due to its lower pH and half of the nitrogen in the form of ammonium and nitrate.

EASY N can also be applied in irrigation water, and as a foliar spray in selected crops.

EASY N is not recommended for use in hydroponic solutions.

The ways in which EASY N might be applied are discussed below in more detail.

SOIL APPLICATION

Pre-plant application in Annual Crops ✔

Spray onto the soil surface, preferably incorporating afterwards, or inject behind tines into the soil.

If applied into prepared beds in row crops close to planting time, apply deeper into the soil than the intended depth of seeding, or off-sett to the side of the intended position of the row.

At Planting in Annual Crops ✔

Apply between the rows; or behind non-seeding tines. If applied behind seeding tines, ensure the fertiliser does not come in contact with the seed or planting material, e.g. band 5 cm to the side of and 5 cm below the seed or transplants in row crops.

Top-dressing Broad-Acre Crops and Pasture ✖✔

When top-dressing crops planted at narrow row spacings or pasture, it is impossible to avoid leaf wetting. As a result, some leaf burn may occur. The degree of leaf burn will depend on one or more of these factors and these factors should not be considered in isolation:

Nozzle selection

Streaming Nozzles minimise leaf contact. They should be considered if the grower wants to minimise burn, where higher rates are used >50l/ha, where temperature is >18oC, Delta T outside range of 2-6 and where the crop is reproductive.

Rate of Application

As rates of Easy N increase so does the level of leaf burn when using flat fans. While other factors contribute to degree of leaf burn (and should be considered), rates of up to 100L can be used. Most flat fan application rates are <50l/ha. Consideration of crop growth stage needs to be considered (see below).

Degree of burn is not affected by increasing rates of Easy N using streaming nozzles.

Environmental conditions

The environment is a major consideration in causing leaf burn. Environmental conditions need to be considered when using fan nozzles (not streaming nozzles). As ambient temperatures increase up to and beyond 18oC, the risk and level of leaf burn also increases. The cooler the conditions, the less rapid the drying on the leaf and therefore less visual leaf damage. Windy conditions (>25kg/hr) also drives rapid drying as does Delta T conditions >8.

Environmental conditions vary greatly both nationally (north tropics/sub topics V south termperate/mediterrean) and regionally.

Crop species

There are variations in tolerance of leaf burn across different crops. Canola leaves will exhibit much less leaf damage compared to cereal crops when using fan nozzles. Visual leaf damage will appear greater using streaming nozzles compared to fans on canola.

For pasture application the optimal time to apply nitrogen is immediately post grazing. This suits Easy N applications with either fan or stream nozzles as there is minimal residual leaf to cause leaf burn damage to. If a new leaf has emerged then streaming nozzles use is recommended.

Crop Growth Stage

While crops are at vegetative growth stages, there is a general acceptance that any foliar burn will not impact final yield (any leaf damage needs to be carefully considered by individual situations ie. manage expectations). Therefore, fan nozzles at higher rates can be used. Once crops become reproduction from growth stage 1st node/2nd node (GS31/32) in cereals, rates should be lowered below 50l/ha, or streaming nozzles used (where rates can be maintained up to 100l/ha). Rates up to 100l/ha can be used in canola up to 20-30% flower using either fan or streaming nozzles.

Follow up rain or irrigation is necessary to carry the fertiliser into the soil and crop root zone. Even using fan nozzles with full vegetative ground cover, only a small amount of nitrogen can be taken up by the leaf.

Foliar sprays of up to 20 L/ha of EASY N can also be considered to help crops overcome the stress associated with waterlogging. Spraying should not commence until the crop shows signs of growth. The crop should not be sprayed while the soil remains waterlogged and growth has stopped.

Similarly, foliar rates up to 20L/ha maybe considered if growing plants are showing nitrogen deficiency on soils that have adequate moisture but, have low nitrogen levels and there are no rain fronts to effectively take topdress nitrogen into the soil for root uptake.

Side-dressing Row Crops ✔

In row crops, apply the fertiliser to the side of the rows, either to the soil surface or place into the soil. Avoid leaf wetting.

If injected into the soil, apply far enough to the side of the rows to avoid root pruning and fertiliser burn to the crop roots.

Avoid application in the centre of the inter-row space where utilization of fertiliser will tend to be poor given the distance the plants roots have to grow to reach it. In addition, the soil is more likely to be compacted and waterlogging is more likely to occur in this area.

Sugarcane ✔

Use coarse streaming nozzles to band the EASY N in the desired position, rather than an over-all soil spray.

Plant Cane

EASY N can be applied anytime from tillering through to the “out of hand” stage.

Prior to “closing in” EASY N should be directed onto the ground in the drill. After “closing in” EASY N should be directed at the base of the stool. This can be achieved using Irvin legs.

Ratoon Cane

EASY N can be applied from straight after harvest to the “out of hand” stage.

Post-harvest, EASY N can be sprayed directly over the stool. In furrow irrigated areas like the Burdekin, it is recommended that EASY N be applied to the side of the stool rather than over the row so that the wetting front from the irrigation water carries the fertiliser into the crop's root zone.

When the cane has tillered and the leaves get above 30 cm in height, EASY N should be directed to either side of the base of the stool to reduce leaf contact and to ensure maximum root uptake. High rates of EASY N may cause temporary leaf burn to sugarcane. Directed application can be achieved using an Irvin spray leg, with the inter-row jets blocked off.

At the "out of hand" stage, EASY N can be applied using a high clearance tractor.

Turf ✔

If applied by boom to turf, split-apply at low rates (<20L/ha) on a regular basis. Irrigate immediately after application to wash the fertiliser solution off the leaves into the soil.

The risk of leaf burn in turf is eliminated if EASY N is applied to turf through the irrigation water.

Trees and Vines ✔

Inject into the soil or direct the spray at the soil. Apply in a broad band under the edge of the canopy or along the hedgerow (as for other soil-applied fertilisers). Avoid spray drift onto the foliage or bark.

Note: EASY N may also be applied through the irrigation water, e.g. under-tree sprinklers or drip/trickle irrigation systems.

Fertigation ✔

This is one of the most popular ways in which EASY N is applied, particularly in horticulture. EASY N can be injected straight into the lines, without further dilution in water. There is no need to weigh out and dissolve the fertiliser, as is there is with solid fertilisers.

EASY N can be used on its own or mixed with other compatible fertilisers.

EASY N can be applied through all types of fertigation systems, including overhead sprinkler systems, as the fertiliser solution that comes in contact with plant leaves will be very dilute (compared to that which would occur if EASY N was applied without further dilution as a foliar spray).

With fixed line overhead sprinkler systems, inject the fertiliser into the fertiliser lines over a reasonable period of time, e.g. mid third of the shift, leaving the last third to flush the lines and wash any fertiliser solution from the leaves.

With travelling irrigators, this will not be possible, however given the dilution of EASY N fertiliser solution being injected continuously, foliar burn is unlikely to occur.

Application Rates when applied to the soil

Soil application rates will be dictated by the nitrogen requirements of the crop. In many situations, e.g. horticultural crops, it is customary to split the seasonal fertiliser needs into a number of smaller applications, e.g. when fertiliser is being applied in the irrigation water (fertigation programs).

Other nutrients, e.g. potassium (K) or sulfur (S) often need to be applied simultaneously with nitrogen (N). The N:K may vary during the growing season, more nitrogen being applied early, and higher rates of potassium with little or no nitrogen late in the growing season.

FOLIAR FERTILISATION ✖✔

There are limits to the amount of nitrogen that can be applied in foliar sprays without burning the leaves. With few exceptions, foliar nitrogen sprays can be used to supplement soil-applied fertilisers, but rarely can they be used to replace soil applications entirely. Crops (and varieties) vary in their susceptibility to leaf burn.

EASY N is normally applied neat, without further dilution in water, in foliar sprays. Its attraction over other nitrogen sources is its high concentration, allowing large areas to be covered quickly with low volume spray equipment, e.g in grain and cotton. Urea is the preferred nitrogen source where dilute nitrogen sprays are used in high volume sprays, e.g. horticulture.

Cotton ✔

EASY N can be used as a foliar spray in cotton to alleviate waterlogging ‘shock’ associated with irrigation or excess rainfall. Waterlogging for more than 16 hours may significantly reduce yield potential.

Preferably EASY N should be applied to crops that are at risk of waterlogging 24 hours prior to the event. 15 – 20 L/ha of EASY N applied pre-waterlogging should be sufficient to maintain the crop for 2 to 4 days.

If EASY N is applied at higher rates (up to 50 L/ha), the risk of foliar burn is greatly increased. In these situations, it is advisable to dilute the EASY N in water to help minimize leaf scorch. EASY N should not be used in young crops at these rates.

Easy N may also be applied after the crop shows signs of growth after a waterlogging event but results may not be as consistent as when applied pre-stress.

EASY N should not be applied while the soil is waterlogged and crop growth is in suspense, as crop damage (foliar burn) may occur. The crop should receive at least 48 hours of direct sunlight after waterlogging before treatment.

Horticulture ✖

EASY N is not recommended for use as a foliar spray in fruit and vegetable crops. In horticulture, where high volume sprays are used, it is customary to use urea as the nitrogen source for foliar sprays.

Low biuret urea (Liquifert Lo Bi) should be used where repeat sprays are used, i.e. foliar nitrogen is applied regularly throughout the growing season. Separate Use Directions are available for Liquifert Lo Bi.

COMPATIBILITY

With Crop Protectants

If tank mixes of EASY N and crop protectants are being considered, check the label of the crop protection product, and only mix the products if it specifically states that it is safe to do so.

Compatibility is dependent partly on the number of additives and the rates at which they are to be applied, water quality (if diluted), application equipment (degree of agitation) and other factors such as time and method of application. Compatibility checks should be carried out even if the chemical manufacturer has recommended the proposed mix. Compatibility Checks need to cover:

- Physical compatibility
- Phytotoxicity to the crop at the target growth stage
- Efficacy of the crop protection product(s)
- Efficacy of surfactant and suspending agents (compatibility aides)

If compatibility information does not exist and a joint application is desired, prepare a small amount of the proposed mix and allow to stand in a glass jar overnight and observe for signs of in-compatibility. A small quantity of the test mix should then be sprayed on a small area of the target crop and observed for 3 to 4 days for any phytotoxic effects.

In winter cereals, the coarse streaming or flood nozzles used to top-dress EASY N are unsuitable for foliar crop protectants, e.g. post-emergence selective herbicides. Flat fan nozzles are required, so that uniform leaf wetting is achieved with minimal soil run-off. When top-dressing, the objective is to have as little as possible of the fertiliser solution remain on the leaves and the maximum amount run off onto the soil. If flat fan nozzles are used to apply EASY N, the application rate will need to be reduced to avoid excessive fertiliser burn to the foliage.

2,4-D amine is not compatible with EASY N or other fertiliser solutions containing ammonium nitrogen.

Fungicides commonly used in winter cereal crops can aggravate the symptoms of foliar burn if applied with EASY N

“SALTING OUT” AT LOW TEMPERATURE

Most liquids have a “salt out” temperature. This is the temperature at which crystal precipitation and growth occurs because the solution is over-saturated and the water can no longer keep the salts in a dissolved state. With EASY N this “salt out” temperature is at or near 0ºC. If other soluble salts or solutions containing salts are added to EASY N, the ‘salt out’ temperature will change.

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

DELIVERY

EASY N is available from selected Incitec Pivot Agents and Dealers in true bulk (full tanker loads) or in 1000 L mini-bulk containers (containing 1,320 kg of product). Dealers may offer variations on this. The mini-bulk containers have a bottom discharge coupling with attached 50 mm camlock fitting. Their tare weight is approximately 50kg.

STORAGE AND EQUIPMENT

Storage Tanks

EASY N is suitable for storage in mild or carbon steel tanks. The corrosion inhibitor used in the product minimises any corrosion effects. However, for long term storage of EASY N, epoxy or polyurethane coatings should be considered for all contact surfaces. Corrugated iron tanks can be used only if a PVC liner is installed.

Aluminium, stainless steel, high-density polyethylene (HDPE) and fibreglass are all acceptable alternatives. HDPE and fibreglass tanks must be suitably rated to account for the SG of the product (1.32). Standard polythene tanks rated for water storage only are not recommended.

Tanks initially designed for petroleum/diesel should be de-rated to about 75% of full volume capacity.

Galvanised or concrete tanks are not suitable.

Suitable second-hand tanks that previously stored chemical products should be de-contaminated where necessary and be well flushed. Off-season maintenance should be to fill tanks with water and a 1% solution of soluble oil or alternatively fill with EASY N. Spillage of product on the exterior of mild steel tanks should be avoided.

It is recommended that tanks have lockable inspection hatches, suitable vent pipes as well as an external sight gauge to assist in storage capacity determinations. If an external sight gauge is not fitted, then safe access to the top of the storage tank to access levels is required.

Tank Fittings

Fittings and couplings used with mild steel tanks should be compatible with mild steel or galvanic corrosion may occur. The use of stainless-steel threaded fittings and couplings is recommended. If aluminium storage is used, then all fittings, piping and pump should be aluminium. Stainless steel or HDPE fittings are the only other materials that can be used in conjunction with the aluminium. HDPE piping and screw type fittings are acceptable for most tanks. Any copper, brass or zinc materials and their alloys are not to be used for any tanks and/or fittings, valves and piping.

Camlocks should be sited between 100mm to 200mm above ground level to allow for ease of handling and should be fitted with a non-return valve. A male 2 or 3 inch Camlock fitting is an industry standard fitting however checks should be made with most likely carriers as to size of fittings to be compatible with tanker unloading equipment.

Pumps and Hoses

Carbon steel, cast iron, aluminium or stainless steels (300 series) are recommended materials for pumps. Centrifugal and most positive displacement pumps are suitable, as are

self-priming plastic pumps. Again pumps must not contain any copper, brass, zinc or alloys of these materials. Pumps should be regularly flushed with water after use. If left standing, formed ammonium nitrate crystals can score shafts of pumps.

Hoses should be of the correct grade or rating to handle the product at the pump pressures. Sufficient flow –through capacity to deliver liquids to the pump, application tank and equipment in the required volumes is essential. Suction hoses must be strong enough to prevent collapse during periods of high temperature or crimping at sharp bends. Polythene or PVC hosing is preferred because of flexibility and lack of corrosion.

Application Equipment

Truck mounted contract application spray equipment and grower's boomsprays need modification if brass or galvanic fittings such as filters, nozzles, valves, control units etc are currently fitted. Replacement with plastic-polymer, stainless steel, sintered aluminium (or ceramics in the case of nozzles and discs) components is needed.

Nozzles types capable of delivering high volumes but having large droplet sizes to reduce drift potential such as Streamjet^{R}, Turbo Floodjet^{R}, Fulljet^{R} are recommended. Equipment manufacturers such as Spraying Systems Co. – TeeJet Australasia (www.teejet.com or teejetoz@spray.com) can assist in selection of suitable replacement components.

Siting of on-farm Storage Facilities

In locating tanks for EASY N storage consideration should be given to the following aspects:

- Easy access for delivery tankers (up to 19m in length) including wet weather access if practical.
- Allowing the storage fill point to be within 6metres on the left side of the discharge point of the tanker (usually the tanker mid point).
- Avoid siting near or under overhead power lines.
- Avoid siting near drinking water wells and bores.
- Site away from water-run off areas and maximise distance from creeks etc to reduce accidental pollution effects.
- Access to water supply for pump flushing and wash downs

Level tank foundations are important for all types of tanks but especially for cone-bottomed or fibreglass tanks. It is recommended that the latter tank types should be on re-enforced concrete bases. Fibreglass Tanks are very easy to rupture if tilted and cone-bottom tanks can topple because of their high centre of gravity if foundations are unstable.

Blue metal or similar base materials are preferred for flat bottom metal tanks as these allow water and any spills away from tank bases.

All foundations should be designed for the fill weight of the tank and should be tested with water prior to use with EASY N.

Metal tank bottoms should be coated with epoxy or similar materials to prevent corrosion.

It is highly recommended that storage areas are bunded. The volume of the bund should be a minimum of 110% of the tank(s) volume or as otherwise required by relevant standard/legislative requirements. Bund walls and floor should be impervious to water. Materials suggested are compacted clay walls with at least 2mm HDPE sheeting type liner or concrete block walls and concrete floor.

For Queensland sited bulk storage facilities it is suggested that the nearest regional office of the Environmental Protection Agency be contacted for any siting advice and approvals. Single bulk storage greater than 10m^3 may need EPA approval. The position regarding the NSW EPA is to be advised.

Bunds should have a drainpipe from the bund low point with a (preferably) locked stainless steel valve located outside the bund wall. This will allow emptying in wet weather.

CORROSIVITY AND CARE OF EQUIPMENT

A corrosion inhibitor is added to EASY N during its manufacture, but it is still corrosive to many metals, including brass, copper or zinc or alloys of these metals. Use of mild steel is only recommended for storage vessels and couplings and pump castings. Cast iron and aluminium pump casings are acceptable. Aluminium, stainless steel, PVC and Fibreglass materials can be used.

Flush application and fertigation equipment after use.

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

SAFETY DIRECTIONS

- Avoid contact with eyes or skin.
- Wash hands after use.
- Avoid inhaling mist.
- Refer to the EASY N “SDS” (Safety Data Sheet) for more specific advice.

WARNING

Before using fertiliser seek appropriate agronomic advice. 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 different products are mixed and sprayed together, the water is of poor quality, or the spray is applied under hot dry conditions, e.g. in the heat of the day. Because climatic and soil conditions, application methods, irrigation and agricultural practices are beyond the control of Incitec Pivot Limited and cannot be foreseen, Incitec Pivot Limited accepts no responsibility whatsoever for any commercial damage, loss or other result following the use of this product whether used in accordance with directions or not, subject to any overriding statutory provision and provided that such liability under those provisions shall be limited to the replacement of the goods as supplied or the rendering again of the services that are provided. The buyer accepts and uses this product subject to these conditions.

In providing these guidelines, Incitec Pivot Limited does not assume a duty of care.

Users of EASY N should ensure that storage and use of the product complies with statutory requirements.

To the extent permissible by law, Incitec Pivot makes no representations or warranties (express or implied) that the information contained in these guidelines will be suitable in all situations.

Independent advice may need to be obtained if users are uncertain about the set up and operation of storage tanks for EASY N specific for their conditions.

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