

NAUTICAL NOTES

NOTE No 4

23.07.90

CARRIAGE OF BULK PRILLED NITROGENOUS FERTILIZER



We have over many years encountered various problems associated with coagulation and compaction of prilled nitrogenous fertiliser in bulk. The majority of fertiliser carried is in the form of urea, ammonium nitrate or sodium / potassium nitrate.

The fertiliser can be shipped in 50 kg bags, in flexible intermediate bulk containers (FIBC) up to 1 tonne or in bulk for bagging on completion of discharge.

On arrival at the discharge ports it is not uncommon for the prilled fertiliser to be found in a compacted state. This condition may be easily identified if the product is in pure bulk form, however, it may not so easily be identified if carried in bulk bags or palletised bags.

Compaction or coagulation may occur prior to discharge due to one or more of the following reasons:-

- Insufficient drying carried out prior to loading. If the product is dried utilising a blown air system there should be sufficient volume of air to carry out the drying process.

- Insufficient anti-caking agent applied. If anti-caking agent applied. If anti-caking agent is used it is most important that the correct application rate should be applied.
- Insufficient priming/curing time prior to loading. Anti-caking agents require time to act before loading or bagging.
- Loading/bagging in conditions of high humidity. During times of high humidity many prilled fertilisers become remarkably hygroscopic and will absorb moisture from the atmosphere.
- Water ingress during sea passage. This may occur either due to leaking hatches or ingress via the bilge system.
- Moisture due to condensation. If the passage is subject to variable temperatures, condensation may form on the ship's structure and fall onto the cargo. Ventilation on passage may have to be considered but instructions should be sought from shippers.
- Natural compaction due to motion of the vessel whilst on passage.

The problems encountered by the farmers as end users may be listed as follows.

- Time factor. The time taken to manually break down the lumps to a free flowing state may be excessive, greatly increasing the time taken to spread a given acreage.
- Uneven spread rate. If the lumps are not completely broken down, blocking of the spreader outlet may occur reducing the application rate or even cutting off the flow completely. This results in uneven spread of the product. Crop reduction may be a direct result.
- Spillage. A considerable amount of spillage may occur when large lumps drop into free flowing prills. This has an effect of increasing time taken and also wastage.
- Damage to machinery. The unexpected dropping of large lumps of product into hoppers may result in damage being occasioned to the hopper sides or distortion of the filter grid.
- Safety implications. Various comments have been made to our surveyors concerning this aspect. Where bags are suspended over the spreader hopper and the bottom of the bag slit to allow the product to flow into the hopper, some part of the human body will of necessity be partially below the bag during this operation. If the bag is slit and the weight of the solid lump splits the bag further and suddenly drops, injury may result.

It should be pointed out that the compaction or coagulation does not impair the quality of the product once it has been broken down to a usable free-flowing condition.

The agro chem and fertiliser industry advisors suggest that the use of bulk fertilisers can save up to £8.00 per tonne in spreading costs. However, this saving is not sufficient to compensate farmers for the additional time taken to break down the lumps to a usable condition. In addition, we have seen rebates of up to £5.00 per tonne made to farmers as compensation.

Late deliveries may aggravate the problems necessitating the farmers accepting the product rather than rejecting it and awaiting fresh delivery.