

Guidelines for the Storage and Handling of Bulk Fertiliser

Good storage and handling practices ensure a safer workplace and a cleaner environment while helping maintain the quality of fertiliser products and blends for the end user. This document provides guidance on best practice for the storage and handling of bulk fertiliser from receipt through to dispatch. Every part of the supply chain is encouraged to take responsibility for maintaining the product quality - both physical and chemical - so that it is fit for purpose for the end user.

STORAGE CONSIDERATIONS

- **PLAN** storage requirements well in advance to minimise handling.
- **STORE** product in covered warehouses.
- **KEEP** warehousing surrounds well drained to prevent moisture tracking into the store.
- **KEEP** non thorough-fare doors closed.
- **SEAL** and keep warehouse weather-tight, where prolonged storage is required.
- **REMEMBER** areas where humidity/temperature exceeds 75%/20° – 28° are the greatest risk for product quality.
- **ROTATE** all products in store, so first-in is first-out.

RECEIVING PRODUCT INTO STORAGE

- **REMOVE** all fertiliser from delivery vehicles.
- **REMOVE** all residue of prior products from the receiving warehouse or bay.
- **USE** an 'intake' system if available – ensure it is clean to reduce contamination.
- **ROTATE** stock by moving current stock to the front, or to another bin.
- **MAXIMISE** available storage space by regularly pushing up fertiliser.
- **DON'T** exceed bay capacity; this can lead to product overlap/cross contamination.
- **KEEP** wheels out of product and **REDUCE** truck movements in store.
- **DISPLAY** visible product labels in all storage areas.

STORING AND SEGREGATING BULK PRODUCTS

- **UNDERSTAND** the characteristics of each fertiliser product (e.g. how hygroscopic; how hard).
- **DO NOT** store incompatible products next to each other, such as urea near superphosphate.
- **DO NOT** store hygroscopic fertilisers next to exterior doorways.

HANDLING PRODUCT

- **ENSURE** bucket is clear of product residue.
- **DON'T** overfill loader bucket; this will help to minimise spillage.
- **CLEAN** edges of bins as they are emptied.
- **OPERATE** to the conditions and limitations of the particular fertiliser product.
- **IMMEDIATELY** collect any spillage and return to storage.
- **KEEP** wheels out of the product.

BLENDING

- **ENSURE** the blending plant is clear of previous fertiliser product.
- **CHECK** chemical and physical compatibility.
- **BLEND** as close to load out time as practical.
- **REMEMBER** once mixed certain product will become more susceptible to moisture uptake.
- **DO NOT** mix non-compatible products under any circumstances.

BAGGING OFF

- **BAG OFF** product as soon as practical to protect product quality, where stock is required to be carried over winter periods or is received in bulk for a bagged market.
- **TIE** closed bulk bags to prevent ingress of moisture.
- **STACK** bulk bags and pallets of small bags no more than three high.
- **ROTATE** stock, so first-in is first-out.

TRANSPORTING FERTILISER, RECEIVING & DISPATCH

- **DON'T** drive over product.
- **CLEAN UP** prior to vehicle movement.
- **ENSURE** vehicle decks are leak-free and dry.
- **ENSURE** covers are clean and dry so no contamination occurs.
- **SECURE** and cover all loads to ensure no losses, spillages or moisture ingress.
- **REMEMBER** covering product protects its quality.
- **CONSIDER** covering some lines or long-stay fertilisers.
- **USE** plastic sheeting, > 0.1mm thickness, overlapped and weighted to prevent slippage.

REASONS FOR CAKING

- Fertilisers are sensitive to the humidities of the surrounding air; above critical relative humidity (CRH), they will absorb water.
- The CRH will decrease with higher temperature and humidity.
- The CRH will change when products are blended.
- Granule strength and shape.
- Storage time.
- Storage proximity to antagonistic fertiliser and open doors (see 'storing and segregating bulk products').

Caking tendency remains low if these parameters are controlled. Most susceptible fertilisers contain anti-caking agents, which reduce the product's water absorption rate. However, poor handling of the fertiliser will reduce the effectiveness of the anti-caking agent.

REASONS FOR DUST FORMATION

- Dust and fines arise during handling from:
 - water absorption
 - poor surface structure and particle strength
 - low mechanical resistance
 - mechanical stresses in the handling chain
 - wear and tear from equipment (intakes, trucks, grabs, hoppers, trimmers, scrapers and mobile plant).

Large amounts of fertiliser dust causes discomfort in the workplace. Dust emission from handling operations can be restricted by law or site consents. Good housekeeping practises and minimising handling will go a long way toward eliminating these issues.

These guidelines have been collated by The New Zealand Fertiliser Quality Council (FQC). The FQC is responsible for Fertmark, the fertiliser quality assurance scheme, and Spreadmark, the fertiliser spreading accreditation programme.