

product compatibility

Ballance Agri-Nutrients distributes a wide range of high-quality fertilisers, each of which will remain suitable for use for a considerable time, provided that they are stored correctly.

However, Ballance technical sales representatives provide tailored solutions to meet the needs of individual farms. This means that fertilisers are frequently blended prior to being spread. The success of this depends on the physical and chemical characteristics of the products involved.

physical characteristics

The physical characteristics of any fertiliser are described in terms of the:

- mean particle size
- range of particle sizes
- bulk density

The mean particle size is represented by the size guide number (SGN). In New Zealand, SGN values typically range from 95 to 475. The higher the SGN, the larger the mean particle size. Effectively, the SGN divided by 100 gives you the diameter (in mm) of the most frequently occurring sized particles, e.g. if a product has an SGN of 330, the largest fraction of particles will be between 2.9 and 3.7 mm in diameter.

Of course, the mean particle size just gives an indication of the size of the largest fraction of the fertiliser granules. Some granules will be bigger and others smaller. This is indicated by the range of particle sizes, which is reported as a uniformity index (UI). In New Zealand, UI values typically range from 5 to 68. The higher the UI, the more uniform the product.

The bulk density (BD) is a measure of the weight of a unit volume of fertiliser, typically expressed in kg/litre. In New Zealand, BD values typically lie between 0.7 and 1.8 kg/litre.

chemical characteristics

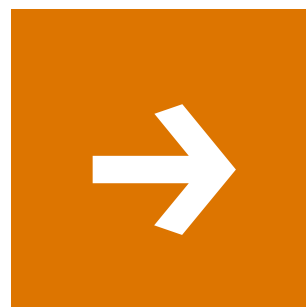
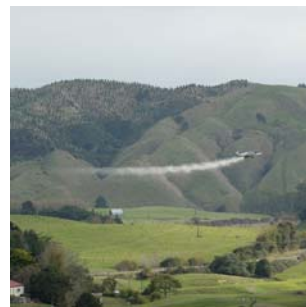
The chemical characteristics of any fertiliser may be distinguished on the following criteria:

- Tendency to attract moisture
- Presence of free acid
- Presence of strong bases
- Oxidising potential

The most common fertiliser that attracts moisture is urea. This absorbs moisture from the air and can turn to liquid or set up into solid blocks. If mixed with super-based fertilisers, urea can turn the mix into wet sludge. DAP and SOA will have the same effect.

Super-based fertilisers have some free acid in them and when mixed with lime-based products the result is reversion of the product and heat generation.

Similarly, products such as Calmag, which are strong bases, should not be mixed with super-based products as the outcome will be reversion and heat generation. In addition, strong bases should not be mixed with ammonium-based products, as this can encourage ammonia gas to be given off.



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Some fertilisers, for instance potassium nitrate and calcium ammonium nitrate (CAN) have a strong oxidising potential. When mixed with reactive substances (such as Durasul) they have the potential to cause fire or explosion.

impact on blending and spreading

Aside from any potential chemical reactions, the successful blending and spreading of a mixture of fertilisers is highly dependent on their physical compatibility. Products with similar physical characteristics (in terms of the SGN and UI) will blend and spread better than products with widely differing physical characteristics. When products with widely differing SGN and UI values are mixed, the result is likely to be segregation and uneven spreading.

For any blend, the spreading stability of the mixture is worse than the spreading of either of the individual components. If three fertilisers are mixed together to make a blend, then the spreading characteristics of that blend will be poorer than the characteristics of the two worst products in the blend.

special precautions

The stability of some blends is affected by factors other than the physical and chemical compatibility of the fertilisers.

- High temperatures – the higher the temperature, the lower the mixability of the products
- High product moisture content – the higher the moisture content of the products, the lower the mixability of the products
- High atmospheric humidity – the higher the atmospheric humidity, the lower the mixability of the products. This is especially true for blends containing nitrogen
- High water-soluble phosphate content – the more water-soluble phosphate in a product, the lower its mixability
- Small granule size – in general, the smaller the granule size of the products, the more difficult they will be to blend
- Presence of other materials – mixing fertilisers with other materials reduces the mixability of the products.

storage

In general, fertiliser products should be stored in cool, dry conditions. This will minimise the chance of any product degradation. Moisture – whether from rain or high humidity – will cause any fertiliser to deteriorate, which will make spreading difficult.

Any blends containing nitrogen should be spread on receipt, whether they are in bulk or bagged form. Storing such products – even in cool, dry conditions – will almost inevitably result in spreading difficulties.

Advice on the storage of specific products or blends can be obtained from your local Ballance technical sales representative or service centre manager.



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