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Nitrophosphate

Module 3.3-5 The production and application of nitrophosphate fertilizers is largely regional, its use centered where this technology is advantageous. The process uses nitric acid instead of sulfuric acid for treating phosphate rock and does not result in gypsum byproducts.

Production. The majority of commercial P fertilizer is made by reacting raw phosphate rock with sulfuric or phosphoric acid. The sulfuric acid method of producing P fertilizer results in large amounts of calcium sulfate (gypsum) by-product that incurs additional disposal costs. Nitrophosphate differs because it involves reacting phosphate rock with nitric acid. Nitric acid is made by oxidizing ammonia with air at high temperatures. A primary advantage of this method is that little or no S inputs are required. With the nitrophosphate process, excess Ca from the phosphate rock is converted to valuable calcium nitrate fertilizer instead of gypsum. The nitrophosphate method was first developed in Norway and much of the global production still occurs in Europe.

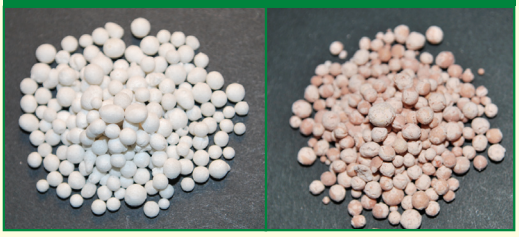
The general reaction is: Phosphate rock + Nitric acid→Phosphoric acid + Calcium nitrate + Hydrofluoric acid. The resulting phosphoric acid is often mixed with other nutrients to form compound fertilizers containing several nutrients in a single pellet. The co-generated calcium nitrate or calcium ammonium nitrate is sold separately.

Chemical Properties

The chemical composition will vary depending on the combinations of nutrients used to make the final granule. Popular grades of fertilizer made with the nitrophosphate method include:

20-20-0, 25-25-0, 28-14-0, 20-30-0, 15-15-15, 17-17-17, 21-7-14, 10-20-20, 15-20-15, and 12-24-12

Nitrophosphate Granules



21-7-14 formulated with potassium sulfate

16-16-16 formulated with potassium chloride

Agricultural Use. Nitrophosphate fertilizers can have a wide range in nutrient composition depending on their intended use. It is important to select the proper composition for each specific crop and soil requirement. Nitrophosphate fertilizer is sold in granular form to be used for direct application to soil. It is commonly spread on the soil surface, mixed within the rootzone, or applied as a concentrated band beneath the soil surface prior to planting.

Management Practices. Nitrophosphate fertilizer contains varying amounts of ammonium nitrate, which attracts moisture. To prevent clumping or caking, nitrophosphate fertilizers are generally packed in water-tight bags and protected from moisture before delivery to the farmer.

Source: http://www.ipni.net/specifics