

DIAMMONIUM PHOSPHATE



Diammonium phosphate (DAP) is the world's most widely used phosphorus fertilizer. It's made from two common constituents in the fertilizer industry and its relatively high nutrient content and excellent physical properties make it a popular choice in farming and other industries. Nutrients include P₂O₅ (46%) and ammoniacal nitrogen (18%). DAP provides the correct proportion of phosphate and nitrogen needed for farming wheat, barley and vegetables. It is also applied in the early stage of fruit orchard fertilization.

Ammonium phosphate fertilizers first became available in the 1960s and DAP rapidly became the most popular in this class of products. It's formulated in a controlled reaction of phosphoric acid with ammonia, where the hot slurry is then cooled, granulated and sieved. DAP handles and stores well. The standard nutrient grade of DAP is relatively high, at 18-46-0, so fertilizer products with lower nutrient content may not be labelled DAP.

Production amounts to more than 20 m. tonnes a year, of which about 12 m. tonnes are traded internationally. It is produced in around 20 countries worldwide and consumed in every developed agricultural market. The largest producers are US, China and India, who have massive domestic markets to serve. The main exporters are producers in the US, Morocco, Tunisia, Jordan, Russia, Lithuania, Australia and China.

AGRICULTURAL USES



Diammonium phosphate is a granulated fertilizer, with granules in size 5-5 mm (min. 95%). Granules can be white, grey or black (with tones). DAP contains 18% of nitrogen in ammonia form and 46% of phosphorus as ammonium phosphate (exact formula can differ slightly depending on producer). DAP is commonly used universal fertilizer which can be applied for field crops and for vegetables and in orchards.

DAP fertilizer is an excellent source of Phosphorous (P) and nitrogen (N) for plant nutrition. It is highly soluble and thus dissolves quickly in soil to release plant-available phosphate and ammonium. A notable property of DAP is the alkaline pH that develops around the dissolving granule. Granulated universal highly concentrated nitrogen-phosphorus fertilizer. Value of nitrogen and phosphorus 18-47 increases the resistance of plants to adverse environmental factors (drought and frost) and increases the resistance of plants to disease. High content of phosphorus contributes to the accumulation of sugar in the root crops and fruits. Suitable for all soils and under all kinds of cultures as the basic fertilizer and as feed in the spring and summer period to speed up the ripening of fruits and berries.

DAP is used to provide plants with the phosphorus they need. Because it also includes sulphur, it provides plants with their sulphur requirements. If it does not provide enough sulphur, it should be combined with the necessary amount of sulphur-containing fertilizer. The phosphorus in this fertilizer reacts more quickly than the phosphorus in other fertilizers. The effects last for several years. DAP is applied to grain crops at the

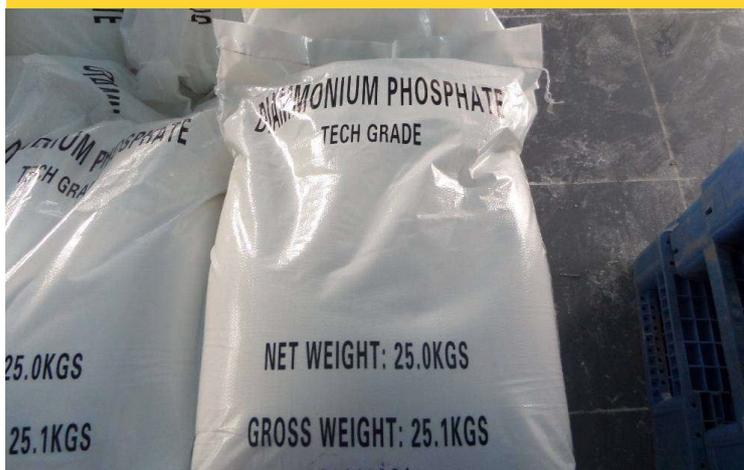
time of planting. If an insufficient amount of DAP is used, the roots will remain weak, development will be insufficient, maturity will be delayed, the plants will remain small, the leaves will take on a purple or dark green colour and yield will be low. If it is applied too early, the phosphorus in the fertilizer will mix with the lime and other elements in the soil and lose its effectiveness. If it is applied after planting, it remains on the surface and has no value to the plant.

NON-AGRICULTURAL USES

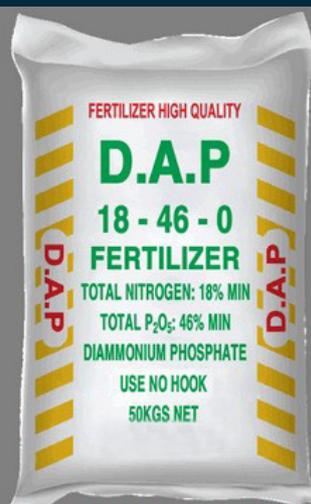


DAP also acts as a fire retardant. For example, a mixture of DAP and other ingredients can be spread in advance of a fire to prevent a forest from burning. It then becomes a nutrient source after the danger of fire has passed. DAP is used in various industrial processes, too, such as metal finishing. And, it's commonly added to wine to sustain yeast fermentation and to milk to produce cheese cultures.

PACKAGING



Usually shipped in bulk or packed in 25 kg -50 kg bags or in jumbo bags 1000 kg - 1500 kg. Exporters are now experimenting with bulk containers that are especially built for bulk grain type free flowing cargoes. Bulk bags or smaller packaged products stored in tiers should be stacked, racked, blocked, interlocked or otherwise secured to prevent sliding, rolling, or collapse.

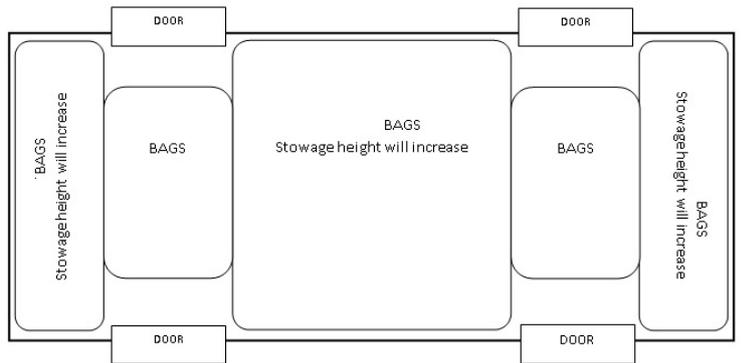


TRANSPORTATION





DAP can be transported by any means of transportation. DAP can also be transported in bulk by ships & then bagged at the ports itself. The bags sizes are usually of 25, 50, 1000 & 1500 kgs. The bagged cargo can be shipped by road or by rail-rakes. The trucks should be ideally closed-body type or duly covered with good quality tarpaulins.



Trucks & wagons should be duly checked for any leakages or sharp protrusions. To protect bags from staining in monsoons, old tarpaulins or plastic sheet can be spread on the bed of truck or wagon. Caution should be practiced when opening truck or wagon doors as product may have shifted during transport. Ships should be checked for their water integrity, especially during monsoons or when heavy weather is expected during the voyage. When bagged or palletised, DAP can be shipped in containers also.



Rail wagons should be close-body type with properly sealed doors. The doors can be additionally sealed using plastic tarps or sheets to ensure that water will not enter the wagon. The storage in rail wagons should be so done that the bags are stowed away from doors as rail wagons are not well known for their water integrity.



STORAGE

It is stored and transported as a solid at ambient temperatures. When transporting in closed decked vessels, DAP should be packed in bags. DAP can absorb moisture on long-term storage under high humidity conditions. Hence it should be stored in a well-ventilated & dry place. The flooring should be concrete and ideally laid out with tarpaulins or pallets and protected from moisture.



If bulk stored in stockpiles, it may form steep piles that can collapse without warning. The risk of cliffing and collapse increases if product is loaded or stored when hot or in high humidity conditions. Avoid forming steep slopes when removing or bagging DAP from piles.

HAZARDS

DAP is hygroscopic and may harden in the cargo space under humid conditions.

FIRE

DAP melts and decomposes at 155°C to form MAP and ammonia. However, it will release ammonia at lower temperatures but above 100°C. At elevated temperatures e.g. in case of a fire, it can decompose releasing nitrogen oxides, phosphorus oxides and fluorides. Neither compound is flammable, nor do they exhibit explosive or oxidizing properties. This cargo is non-combustible or has a low fire-risk.

PRECAUTIONS

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Persons who may be exposed to the dust of the cargo shall wear protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary.

On ship, the cargo spaces carrying this cargo should not be ventilated during voyage. In case cargo is noted to have high moisture levels, the ship's logbook should be checked for ventilation. The log should show no such activity has been done.

Diammonium phosphate may be harmful to aquatic life at relatively high concentrations. However, it has low acute toxicity to fish. Large-scale release may lead to eutrophication of waterways.

Being the most widely used fertilizer and its application at correct time & with correct procedure requires that the product reaches the farmer in good & safe condition. Torn or humid bag will not only cause him financial loss but also the yield of crop can get affected. Hence from packaging to transportation & distribution of this product plays very important role in food chain of the world.