



# Phosphorus Fertilizer Management

## Conservation Practice Information Sheet (IS-MO723dap)

### MAP and DAP Use in Missouri

With changes in the fertilizer industry, it is now difficult to create desired fertilizer blends within the limitations of conservation practice standards and specifications. The main concern is phosphate fertilizer products that contain nitrogen.

Local fertilizer suppliers/dealers may not stock triple superphosphate, known as TSP (0-46-0). The common phosphate products now available are monoammonium phosphate, known as MAP (11-52-0), and diammonium phosphate, known as DAP (18-46-0). The more common product in Missouri is DAP. Both of these fertilizer products contain nitrogen that is not always needed or desired in a cropping system or forage system.

MAP, DAP, and TSP will be acceptable products to create desired fertilizer blends. The amount of P and K applied will not exceed the recommendation for the planned crop or crops in the rotation based on a current soil test. N rates will not exceed the annual soil test recommendation. Field office staff will identify those suppliers that have TSP available and alert producers of these sources to meet the phosphorus need when nitrogen is not recommended by a soil test.

#### **1) Cropland Fertilizer:**

Fertilizer products that contain nitrogen (N), phosphorus (P), or potassium (K) will be fully accounted for in the nutrient budget when applied to cropland.

#### **2) Pasture and Hayland Fertilizer:**

##### **Maintenance of Forages:**

Fertilizer products (N-P-K) applied to forages will be fully accounted in the nutrient budget. The amount will not exceed the soil test recommendation for the planned forage rotation and soil test cycle with N rates not exceeding the annual need.

##### **Establishment of Forage Stands to be Dominated by Cool Season Grasses:**

Cool-season grasses generally require a significant input of nitrogen fertilizer as manure or commercial products. Fertilizer products (N-P-K) applied for forage establishment will be fully accounted in the nutrient budget. The amount applied will not exceed the soil test recommendation for the planned establishment.

##### **Establishment of Forage Stands to be Dominated by Legumes or Warm Season Grasses:**

Warm-season grasses or stands dominated by forage legumes generally have a low requirement for nitrogen fertilizer (often 0 lbs./ac. is recommended). Any N applied and available prior to seedling germination will stimulate the growth of weedy or competitive species at the expense of the desired species. When MAP or DAP must be used to meet the P need only when TSP is not available, select one of the following alternatives when the N amount is more than 30 pounds per acre in the fertilizer blend:

- Alternative 1: Delayed Applications - Delay any MAP or DAP application until more than 50 percent of the seedlings have emerged. The fertilizer blend will be applied three (3) weeks or more after emergence of the desired species but within eight (8) weeks after emergence. Apply fertilizer rates and blends that will not injure the emerging seedlings. MAP is the preferred product due to the higher ratio of P to N.

*Pros of Alternative 1* – Least hassle; can apply fertilizer in one pass when rate will not harm seedlings.

*Cons of Alternative 1* – Fertilizer is not plant-available during germination and emergence of new forage crop. Application of DAP with 18 percent nitrogen may cause fertilizer burn to small seedlings.

- Alternative 2: Forage Stockpiling - Apply the entire amount of fertilizer based on the soil test recommendation for forage establishment by August 31. Allow the pasture to develop stockpiled forage for the winter season. Plan seedings to occur during the dormant season or the spring seeding season after grazing removes the stockpiled forage. Make sure that the current vegetation growth (competition) is controlled by tillage, herbicides, or grazing management prior to planting the seeded species.

*Pros of Alternative 2* – N provides accelerated vegetative growth; P and K are available for germination and emergence of seeded species.

*Cons of Alternative 2* – Any fertilizer promotes significant cool-season grass growth; good management is needed to use this forage properly. Seed placement may be more difficult through surface residue.

- Alternative 3: Split Applications - Apply MAP and DAP ahead of the seeding to allow the N component time to be utilized by vegetation. Limit the amount of N applied prior to a legume or warm-season grass seeding to the soil test recommendation or no more than 30 pounds N per acre if no N is recommended. Additional N, P, and K will be applied after emergence of the seeded species. Possibilities are:

a) Summer or Fall Seedings – Apply MAP or DAP two months prior to the seeding date not to exceed the soil test recommendation or 30 pounds N per acre. When the fertilizer blend and planned rate supplies N in excess of the 30 pound per acre limit, the excess N in the fertilizer blend will be applied in a split application three (3) weeks or more after emergence of the desired species but within eight (8) weeks after emergence. Fertilizer rates and blends that are applied after emergence will be managed to prevent injury to the emerging seedlings.

b) Dormant or Spring Seedings - Apply MAP or DAP by December 1<sup>st</sup> at a rate not to exceed the limit of 30 pounds N per acre. Excess N in the fertilizer blend beyond the 30 pound per acre limit will be applied in a split application three (3) weeks or more after emergence of the desired species but within eight (8) weeks of emergence. Fertilizer rates and blends that are planned after emergence will be managed to prevent injury to the emerging seedlings.

*Pros of Alternative 3* – Good system to manage nutrients; nutrients available for emergence.

*Cons of Alternative 3* – Extra cost for each fertilizer application; requires management over a longer period of time. N applied after germination may cause fertilizer burn to small seedlings.

- Alternative 4: Nutrient Budgeting based on Phosphate – planning for nutrient use during the soil test cycle will be used to reduce the amount of phosphate fertilizer required during establishment. The application of DAP will not exceed 76 pounds and MAP will not exceed 142 pounds of phosphate per acre applied during seeding establishment. A nutrient management plan will be developed according to NRCS policy and reviewed with the landowner to show the nutrient budget (N-P-K) for the establishment year and the nutrient requirements for the following three years of production.

*Pros of Alternative 4* – Costs of fertilizer for establishment is spread over a longer time period; the initial fertilizer cost is not as prohibitive when soil test P is very low.

*Cons of Alternative 4* – Additional staff planning time required to develop the nutrient management plan; no guarantee that additional phosphate will ever be applied.