

**Table 12.** Characteristics of primary phosphorus sources used in turf fertilizers.

Source	Nutrient Percentage			Salt Index per Unit of Nutrient <sup>a</sup>	Acidifying Effect	Comment
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O			
<b>Phosphorus Carriers</b>						
Monoammonium phosphate (MAP)	11	48	0	2.44	Medium	Soluble P source used in many fertilizers. Provides N and reduces soil pH. Preferred to DAP when applied to alkaline soils.
Diammonium phosphate (DAP)	18	46	0	2.85	Medium	Soluble P source that contains higher N than MAP and also reduces soil pH. Can cause significant ammonia losses on alkaline soils.
Superphosphate	0	20	0	0.46	Neutral	Contains Ca (18% to 21%) and S (12%) as gypsum.
Triple superphosphate	0	46	0	0.22	Neutral	Concentrated P source containing Ca (13%).

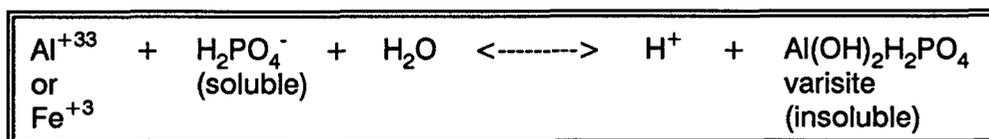
<sup>a</sup>Generally, the higher the salt index/unit of nutrient, the higher the burn potential of the particular fertilizer material.

The following formula can be used to calculate the phosphorus content of fertilizers:

$\begin{array}{l} \% P_2O_5 \\ \text{(as expressed on} \\ \text{fertilizer bag)} \end{array} \quad \times \quad 0.43 \quad = \quad \% P \text{ in fertilizer bag}$
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As mentioned, the amount of available phosphorus in fertilizers is expressed as P<sub>2</sub>O<sub>5</sub>. To relate fertilizer phosphorus content to plant phosphorus requirements, it is necessary to perform the above calculation.

Due to its low solubility in soil solution, phosphorus does not move or leach readily. Therefore, phosphorus applications are not needed as regularly as nitrogen applications. A soil test is probably the best indicator of the phosphorus level in a soil. Indiscriminate application of phosphorus can form high, unhealthy levels of the element. Iron deficiencies, for example, often occur in soils high in phosphorus and/or alkaline content. Phosphorus is most readily available to plants when soil pH ranges from 5.5 to 6.5. At low pH levels (<5.0), soils containing iron and aluminum form an insoluble complex with phosphorus, such that neither nutrient is readily available to the grass. For example, with Al and/or Fe, the following reaction can occur:



Sandy soils lacking iron or aluminum, such as those on many golf greens, do not form insoluble phosphorus complexes. Under these conditions, phosphorus is more available at a lower pH level.

In alkaline soils (pH>7.5), calcium forms insoluble complexes with phosphorus, rendering it unavailable as dicalcium phosphate [CaHPO<sub>4</sub>]. Soil pH adjustment may be necessary to prevent the formation of these complexes, which block the availability of applied phosphorus fertilizer.