

SOIL REFERENCE

P

Soil Phosphorus (P)

Phosphorus requirements may vary greatly depending upon soil conditions and turf management goals. Excess phosphorus can result in contamination of surface and ground water. To prevent over-application and leaching of phosphorus, a phosphorus saturation index (PSI) is calculated (see below) to determine if maximum levels of soil phosphorus have been reached or exceeded. Phosphorus applications should be avoided when the PSI reaches 0.23.

$$\text{Phosphorus Saturation Index (PSI)} = \frac{\frac{\text{P mg/kg}}{31}}{\left(\frac{\text{Fe mg/kg}}{56} + \frac{\text{Al mg/kg}}{27} \right)}$$

(NOTE: Phosphorus and aluminum are Mehlich III extracted)

The minimum desired soil phosphorus level will depend upon turf performance and desire to suppress *Poa annua*.

The role of phosphorus in IPM

The role of phosphorus in control of insects and diseases is not well defined. However, there are some reports that low phosphorus can favor bentgrass in a poa-bentgrass golf course green. The levels below have been targeted toward healthy bentgrass growth and are dependent upon soil pH and extraction methods.

Guidelines

	Low	Normal	Excessive
Bray II P	< 50 mg/kg	>50 mg/kg	Refer to PSI
Mehlich III P	< 50	>50 mg/kg	Refer to PSI
Olsen P (soil pH > 7.5)	< 5 mg/kg	>15 mg/kg	Refer to PSI
PSI	—	<0.23	>0.23

Management

If the phosphorus saturation index (PSI) exceeds 0.23, avoid further application of phosphorus and increase soil iron levels.

Phosphorus products that are used to address deficiencies include:

- 11-52-0 Monoammoniumphosphate
- 18-56-0 Diammonium phosphate
- 0-52-34 Monopotassium phosphate
- 0-45-0 Triple super phosphate