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Phosphorus Buffering Index
(PBI)

The majority of Western Australian soils have low phosphate fixing capacities when compared with soils from Eastern Australia and overseas. This is mainly due their coarse texture resulting from long periods of weathering.
Some coastal soils have almost no capacity to hold applied phosphorus (and other nutrients). For example, the Peel-Harvey catchment. At the other extreme are the gravels and loams of the Darling Plateau - including the Jarrah forest soils of the South West.

Classification of P-Sorbing Properties of WA soils based on PBI			
PBI	**Classification**	**Critical P**	**% Samples**
<15	Extremely Low	23 (20-24)	17.0
15-35	Very Very Low	26 (24-27)	38.2
36-70	Very Low	29 (27-31)	25.1
71-140	Low	34 (31-36)	10.0
141-280	Moderate	40 (36-44)	7.1
281-840	High	35 (44-64)	2.5
>840	Very High	n/a	0.1

Table 1: Indication of classification of PBI.
From the national Better Fertilizer Decision Project.

90% of samples from WA fall into the Extremely Low to Low categories.

Classification of P-Sorbing Properties of WA soils based on PBI		
PBI	**Classification**	**Soil Types**
<15	Extremely Low	Grey sands, Bassendean sands, Badgingarra sands, Wilbray sands
15-35	Very Very Low	
36-70	Very Low	Grey brown sands, deep duplex soils, Lancelin sands, Jerramungup sands, Coolup sands, Esperance sands
71-140	Low	
141-280	Moderate	Grey loamy sands, yellow-brown sands, Coolup loamy sands, Spearwod sands, Dandaragan red earths, Dongara black wattle, Wongan Hills, Merredin sandy loams.
281-840	High	Lateritic gravels, sandy loams, Kununurra clays, Darling Range loams.
>840	Very High	Lateritic loams, iron rich peat, karri loams, podzol hardpans

Table 2: Examples of WA soil types that exhibit certain PBI characteristics.

Effect on P rate (kg/ha) required*		
PBI	**Classification**	**P Rate Required (kg/ha)**
<15	Extremely Low	15
15-35	Very Very Low	18
36-70	Very Low	26
71-140	Low	38
141-280	Moderate	40
281-840	High	40
>840	Very High	40

Table 3: Example of phosphorus requirement for different PBI levels where soil P levels is low.
Requirements will change with crop species and production targets.

In Western Australia the major contributors to high PRI are:

Iron
High free calcium levels
Acid soils releasing aluminium
High zinc levels
Organic carbon