

# [***Get testing for top soil health***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:6BJ7-DDX1-F0J6-J2KS-00000-00&context=1516831)

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**Body**

Tests to help manage acidity and phosphorus levels in ***soils*** are readily available for growers to help maintain productive systems but they are being urged to utilise multiple tests, to gain an accurate overall picture of ***soil health***.

Adequate ***soil*** management can be challenging but SARDI research scientist Andrew Harding believes, through the use of paddock pH mapping and regular ***soil*** testing, growers can ensure out of balance levels did not impact crop or pasture productivity.

"Acidic ***soils*** is an increasing problem in SA and more than three million hectares are prone to acid ***soils***. This number is likely to increase to 4m ha in the next few decades," he said.

"When ***soil*** pH falls below 5.5, it can really affect the potential production of crops and pastures and at the moment, production loss is at about $88m per year."

A survey revealed, ***soil*** acidity is affecting paddocks across Kangaroo Island, the Adelaide Hills, Mid North and Lower Eyre Peninsula, but additional ***soil*** mapping and testing revealed the Adelaide Plains, Yorke Peninsula and parts of the Mallee were also greatly affected.

"It is becoming a big, widespread issue," Mr Harding said.

He said one of the main causes was a high use of ammonium-based nitrogen fertilisers and nitrate leeching.

"Acidic ***soils*** reduce the development of calcium, magnesium, potassium and phosphorus to plants and molybdenum, which is important for nodulation of legumes," he said.

"When acidic ***soils*** are present, 'moly' levels begin to drop off quite quickly and it also decreases nitrogen mineralisation."

When ***soil*** pH drops below 4.8 it begins to let aluminium into the system and ***soil*** solution. It can become quite toxic and burn off plant roots.

It causes plants to reduce water in-take and nutrients, and when it is critically low, plant roots are short and stunted from aluminium toxicity.

A survey in 2011 and 2013, looked at 100 paddocks at random in the Mid North, to measure ***soil*** pH.

In the zero to 10 centimetre surface sample, 24 per cent of paddocks had a pH of 5 to 5.4 and 28pc had a pH less than 5.

In the 10-20cm layer, 13pc had a pH of 4.5 to 4.9 and 3pc had a pH less than 4.4.

Mr Harding said this showed acidity issues were not just in the top ***soil*** but also, in sub-surface layer.

The core issue, according to Mr Harding, was durum wheat, barley, lentils, faba beans, canola, chickpeas and lucerne crops were all sensitive to acidic ***soils***.

"They all seem to be fairly intolerant to aluminium toxicity, too," he said.

But some bread wheats can be fairly tolerant, as can ryegrass, oats, triticale and lupins.

"If you have sensitive crop growing not very well, you may have a dominance of rye grass coming into the system," Mr Harding said.

A recent paddock pH map example also showed the extreme variation in ***soil*** acidity.

It had a range of pH levels from 4.5 to 8.4, which means a range of four pH units within one paddock.

"That is a huge variation, so it is important for farmers to be aware of this," Mr Harding said.

"The key to these maps, is then a lime prescription map shows how much is required for variable rate spreading."

How much lime to apply also depends on ***soil*** type.

In a sandy ***soil***, 2t/ha will raise pH by one unit, while sandy loam require 3t/ha and about 4t/ha for loam to clay loam.

When it comes to phosphorus levels, in SA, it has been historically quite low, according to Mr Harding.

How much phosphorus to apply in a paddock is also dependent on ***soil*** type and he urged growers to make use of multiple tests available to accurately measure it.

"One test measures the extractable phosphorus in the ***soil*** but it does not tell us how much is available to the plants," Mr Harding said.

"Another test measures the amount of input tie-up and leeching potential.

"Phosphorus can be tied up with aluminium in acidic ***soils*** and with high carbonate in alkaline ***soils***. When you have this, extra phosphorus is required."

A newer test also measures available phosphorus to the plant.

For a non-calcareous ***soil***, phosphorus levels should be about 30 to 40 parts per million, calcareous should be 35 to 45 and, according to Mr Harding, most ***soils*** in the Mid North have a pretty good history of phosphorus levels.

"But, it really needs to be maintained. For every tonne of wheat removed, you need to replace that by about three kilograms of phosphorus," he said.

"So, if you take 4t, it needs to be replaced with about 12kg of phosphorus as a maintenance rate."

Anything above 73 for wheat, Mr Harding said, showed the phosphorus was readily available to the plant and anything above 100, means it is highly available to plants.

He said, in sandy ***soils***, any measurement below or well below 73, most likely meant leeching.

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