

# The key to unlocking P

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BARRY WILLIAMS

Following the launch of the phosphate stewardship guide and hub, the principles behind the recommendations are already being put into practice at one Hertfordshire mixed farm. **CPM** learns how P availability has been improved for a healthier and more efficient maize crop.

By Janine Adamson

**R**ather than continue as per recent years, grower Bridget Borlase had a challenge for ProCam agronomist Barry Williams – to grow a maize crop with minimal bagged fertiliser while better utilising soil-P reserves.

Based in Hertford, the jewel in Sacombe Hill Farm’s crown is a long-established pedigree Simmental herd, meaning not only is quality forage an important aspect of the business, but in return, there’s plentiful access to organic manures.

While the main reason behind the challenge was to manage input costs, environmental concerns and adhering to nutritional best practice were also key drivers, highlights Barry. “The farm has always grown forage maize as part of its rotation, usually opting for 150kg/ha of DAP down the spout at drilling.

“However, with volatility in fertiliser prices, plus knowing that the field in question had always tested high for P and K indices due to organic manure applications, the question arose regarding how better to access the locked up P.”

Utilising the P already present in the

soil also has environmental benefits – contributing to reducing P levels in the soil. Phosphate run-off from agricultural soils into local watercourses increases as soil P index increases above 2, which causes eutrophication and reduces water quality.

So understanding that up to 90% of phosphate fertiliser applications can become locked up within days, with only the P within the soil solution immediately available to plants, meant Barry had to think far beyond simply applying more.

As such, being familiar with De Sangosse’s product range led him to the company’s soil nutrient activators, in the hope that application with the crop’s pre-emergence herbicide would improve access to the existing P reserves.

“Maize requires phosphorus early in its life cycle, to help set the foundations for its ultimate performance,” says Barry.

“But despite it being a highly challenging and dry season, the maize didn’t look back, it showed no signs of deficiency. This was then followed by an application of foliar P-smart at 4-6 leaf stage, and urea polymers at

waist high. In terms of the crop’s total nutrition, that was it,” he recalls.

According to Barry, P-deficiency in maize is highly obvious. “However, walking the crop there were no visual signs such as purple discolouration or stunting. Therefore, it’s clear that the soil nutrient activator worked.”

Having recently launched the phosphate stewardship guide and hub, De Sangosse’s Rob Suckling explains that this is because when soil nutrient activators are applied to soil, cations preferentially bind to the product components, rather than phosphate or soil particle surfaces.

“The cation complexes formed allow more phosphate to enter into the soil



## Agronomy challenge

ProCam agronomist Barry Williams was challenged to grow a crop of maize with as little bagged fertiliser as possible.

solution, but these complexes also enable plants to assimilate other cation nutrients such as zinc, copper and manganese that may be unavailable due to chemical fixation or multidentate bonding with soil particles.”

In Barry’s case, because the soils at Sacombe Hill Farm were high-P index, this meant using a soil nutrient activator was particularly relevant, he notes.

“The key is to identify where using these products will be most beneficial – usually in calcareous situations where free calcium cations lead to fast fixation of phosphorus. Always conduct a base assessment – is the crop likely to respond to phosphorus, if so, unlocking it from the soil and extracting what’s already there will likely benefit it too.”

It could be that the arid spring and summer may also have had an impact, suggests Rob. “It’s been a majorly dry season, particularly in the East. As well as the obvious – crops take up nutrients with water – equally, as the soil gradually dries out, nutrients become tightly bonded on the soil surface as moisture precipitates.

“Soil nutrient activators essentially tear the nutrients off the soil and convert them to a highly useable form, remaining active for around 6-8 weeks,” he explains.

Having now seen the maize through to harvest, Barry notes that despite taking an alternative approach to nutrition, the crop performed similarly to other conventionally treated fields in the area.

Plus with two seasons of use under his belt, Barry says his next step for Bridget is to conduct hectare grid

soil sampling across the whole farm this autumn, as well as extend the use of soil nutrient activators into cereal crops, where appropriate.

“The cost of DAP is rising to around £800/t, so combined with the potential of carbon accounting, I believe products like soil nutrient activators will only grow in importance in the coming years.”

While this has been the correct approach for Barry and Sacombe Hill Farm, it isn’t a broad solution for all farms, urges Rob. Reflecting back on the stewardship guide, which is based around the strapline ‘Protect it. Place it. Unlock it.’, he says a full system approach is required.

## SYSTEM APPROACH

“Phosphorus management is a system, not a single input, and requires actions to help manage availability, access and reserves. This could mean maintaining its availability after application, improving early root access, and finally, utilising the existing soil reserves.”

For the ‘protect’ aspect of the guide, this could mean using phosphate protection technologies (PPT), which work through reducing the fixation by soil minerals to maintain P in its plant-available form, explains Rob. This is relevant where there is a crop P requirement and levels of soil P allow for further P input.

“PPT can be delivered as a coating which is applied to starter fertiliser granules. When the granules dissolve and phosphate moves into the soil water, the coating enters the water first, sequestering the cations that



## Preferential binding

When soil nutrient activators are applied to soil, cations preferentially bind to the product components rather than phosphate or soil particle surfaces, explains De Sangosse’s Rob Suckling.

fix phosphate in the soil. These cations are then unavailable to react with the phosphate,” he adds.

For ‘place’, this is about better targeting P from the beginning to increase early root interception and boost crop establishment. “These can be protected microgranular fertilisers – placed underneath the seed within the developing root zone.

“By improving early establishment and rooting, this increases the crop’s ability to capture phosphorus and other nutrients from the soil throughout the rest of the crop’s life,” he highlights.

But regardless, it all begins with robust diagnostics. “Crop performance, grain/ plant analysis, soil analysis, rooting, establishment and field observations should all be considered together. In doing so, this helps to identify the limiting factors at play, and inform subsequent action,” urges Rob. ●

## Innovation Insight

The challenge isn’t P supply – it’s P availability, and that’s something De Sangosse is striving to address through its recently launched phosphate stewardship guide. Delivered in conjunction with ADAS, the guide’s goal is to support growers to maximise crop performance while protecting water. ‘Protect it. Place it. Unlock it.’

Furthermore, De Sangosse has launched a new phosphate stewardship hub and phosphate clinic video series to help growers and agronomists better understand what may be limiting crop phosphorus uptake and what they can do about it.

At its heart is a simple principle: it’s not how much phosphorus you apply, it’s how much the crop can access and use. The new hub brings together information on crop uptake,

grain analysis, soil phosphorus status, root access, phosphorus availability and existing soil reserves.

This is supported by the new phosphate clinic, a series of short videos featuring ADAS’ Dr Christina Baxter and De Sangosse’s Rob Suckling. Together they explore practical questions including what harvest can reveal about phosphorus uptake, why crops may struggle to access phosphorus, how to diagnose potential limitations and how different stewardship approaches can be used.

CPM would like to thank De



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To access the guide, the new Phosphate Stewardship Hub and Phosphate Clinic, visit the De Sangosse website:

