Use soil analysis to get to the root of mineral problems

Take a balanced approach

With fertiliser prices still high, resolve to make this spring your most precise when it comes to grassland applications. Not only will this cut costs and help to boost sward productivity, but cow health and productivity should also improve. We spoke to an agronomist and a nutritionist to find out more.

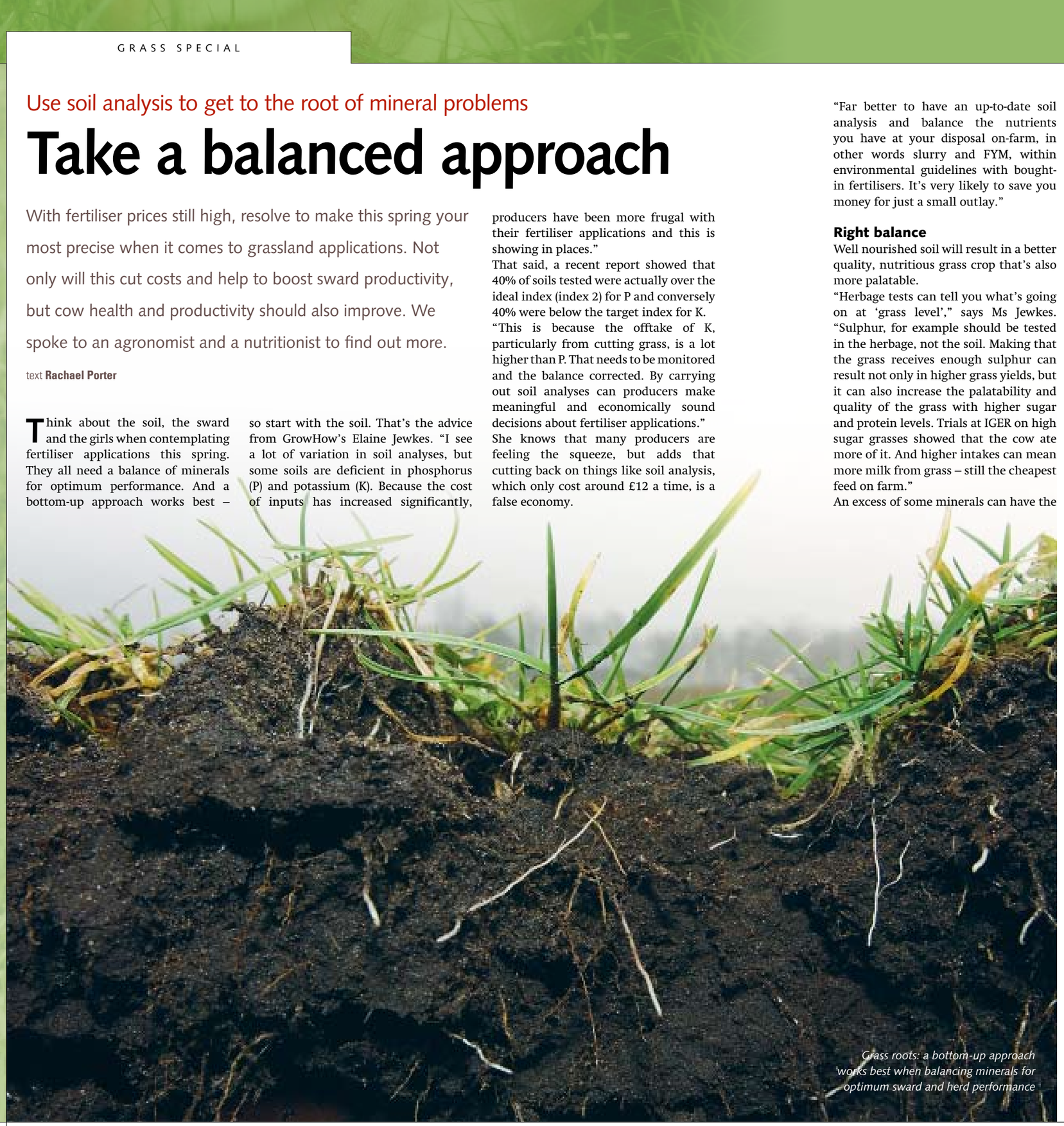
text **Rachael Porter**

Think about the soil, the sward and the girls when contemplating fertiliser applications this spring. They all need a balance of minerals for optimum performance. And a bottom-up approach works best – so start with the soil. That's the advice from GrowHow's Elaine Jewkes. "I see a lot of variation in soil analyses, but some soils are deficient in phosphorus (P) and potassium (K). Because the cost of inputs has increased significantly, producers have been more frugal with their fertiliser applications and this is showing in places."

That said, a recent report showed that 40% of soils tested were actually over the ideal index (index 2) for P and conversely 40% were below the target index for K.

"This is because the offtake of K, particularly from cutting grass, is a lot higher than P. That needs to be monitored and the balance corrected. By carrying out soil analyses can producers make meaningful and economically sound decisions about fertiliser applications."

She knows that many producers are feeling the squeeze, but adds that cutting back on things like soil analysis, which only cost around £12 a time, is a false economy.



Grass roots: a bottom-up approach works best when balancing minerals for optimum sward and herd performance

"Far better to have an up-to-date soil analysis and balance the nutrients you have at your disposal on-farm, in other words slurry and FYM, within environmental guidelines with bought-in fertilisers. It's very likely to save you money for just a small outlay."

Right balance

Well nourished soil will result in a better quality, nutritious grass crop that's also more palatable.

"Herbage tests can tell you what's going on at 'grass level'," says Ms Jewkes. "Sulphur, for example should be tested in the herbage, not the soil. Making that the grass receives enough sulphur can result not only in higher grass yields, but it can also increase the palatability and quality of the grass with higher sugar and protein levels. Trials at IGER on high sugar grasses showed that the cow ate more of it. And higher intakes can mean more milk from grass – still the cheapest feed on farm."

An excess of some minerals can have the opposite effect: "Every now and again I get a call from a producer with a field of grass that their cows just won't graze. A herbage test usually reveals that K and Mg are through the roof, but often the problem can be seen on the surface with a poor sward and a capped or slaked soil. It's usually the result of too much muck – either from hefty applications or from the field being one where the herd is put, say at night, to be close to the buildings – a 'campsite' field.

So, it's all about getting the balance right – for the soil, the grass and the cow. "There's no magic or mystery really. Just testing – that's our mantra that we're constantly banging out. Soil test and, if you really want to get the most from your slurry, test that too.

"There's a NIRS test available now – similar to the one used to test silages – and costs around £25 per sample. Good value for money when you think how much money you can save by using slurry effectively and optimising your use of bought-in fertiliser."

Forage minerals

NWF's Tom Hough is concerned that the mineral status of forages in the UK is deteriorating and he says that this can present a wide range of problems. "Grazed grass is typically unable to supply a cow's requirements of a whole host of essential minerals including calcium, phosphorus, magnesium, copper, zinc and selenium.

"At the same time others including potassium, molybdenum and iron can be present at very high levels. And all will present challenges when supplementing the ration, if performance and cow health are to be maintained."

Mr Hough agrees that many of the problems in grass mineral status can be addressed by taking a close look at the soil. He too believes that P levels have fallen because producers have cut back on applying compound fertilisers to try and save on costs. And he's also a strong advocate of soil sampling to assess P status.

"Soil analysis will also show up any problems with pH. Most producers know that as soil pH falls so dry matter production also decreases. For example at a pH of 5.0-5.5 the dry matter per hectare will be 91% of the optimum production achieved at pH 6.0-6.5. What is less well understood is that as pH falls so more minerals are locked up in the soil which reduces their uptake by plants so increasing the risk of deficiency.

Elaine Jewkes: "Herbage tests can tell you what's going on at 'grass level'"

"Frequency of liming has reduced in recent years and we would advise producers to lime fields if pH is less than 5.9 to maximise yields and ensure that mineral availability is increased."

Aerate fields

He is also advising producers to consider aerating fields. Not only does this improve drainage and promote better root development, but it also improves the uptake of artificial fertilisers and slurry. It can also reduce problems caused by excess molybdenum, particularly copper deficiency.

He explains that molybdenum is antagonistic to copper and high soil levels lead to reduced availability of copper and an increased need to supplement diets with copper.

"Aerating the soil leads to molybdenum being oxidised which reduces its uptake by plants and so increases the availability of copper.

"K is frequently found in excessive levels in grass and this increases the risk of both milk fever and grass staggers. Compacted soils will exacerbate this problem so if this is an issue on your unit then consider aerating the soil. Applications of gypsum will also help."

He adds that there is also a key interaction between K and sodium. "Ideally you should be looking for a ratio of 5:1. In some cases applying 100kg of salt per hectare can improve the balance and so reduce the problems of excess K in the diet. It will also improve grazing palatability and stimulate intakes.

Mr Hough stresses that more attention needs to be paid to soil and forage minerals status. "Producers need to literally get to the root cause of their herd's mineral problem rather than using in-feed minerals as a band-aid for poor soil management.

"It's better for the soil, sward and forage productivity and quality and, ultimately, the cows." |