



Tailored potato crop nutrition

Matching nutrient availability to demand throughout the season

Improvements in marketable yield

Cracking the yield plateau

By Liz Robinson

Addressing crop demand for nutrients throughout the growing season and delivering the right amounts at the right time is the basis behind a new system that is helping one potato company to increase the marketable yield of potatoes.

The OptiYield system, developed by Simon Fox of Emerald Crop Science (ECS), is a sophisticated piece of modeling software that produces detailed recommendations for the 13 essential nutrients required for plant growth and development.

Including phosphorus down to molybdenum, it covers more than 30 crops worldwide, and in the UK work is currently focusing on potatoes, with 18 independent and farm trials being carried out this year. It all starts with an analysis of representative soil samples for up to 30 soil factors, which the OptiYield software uses to apply a series of intricate equations to, to derive a more sophisticated model of total nutrient availability for that soil. It then overlays this with a model of nutrient demand for any given crop

type, explains Mr Fox.

“Potatoes will have a differing demand as the season progresses [growth stage] for nitrogen and the other 12 nutrients.”

OptiYield then produces a set of detailed recommendations and a growth stage-driven programme of nutrient applications on top of the basic RB209 Fertiliser Manual recommendations, specific to the crop, soil analysis and target yield.

His approach includes using a number of proprietary biostimulants that encourage the crop to grow in a particular way, such as encouraging root growth, improving photosynthetic ability, nutrient redistribution and activating the plants’ own defences, explains Mr Fox.

The recommended nutrient and biostimulant products, which are based generally on organic acids and formulated for optimal foliar uptake, are then applied in accordance with need along with the blight programme.

Spoon feeding

This spoon-feeding approach ensures the crop receives the right

spectrum of nutrients at the right time, such as providing calcium in a highly-mobile form during tuber initiation.

The OptiYield model doesn’t cover nitrogen, and growers are directed to RB209 or SI378 guidelines, although ECS use a complementary system for nitrogen management. But there are applications for specific mobile forms of foliar P, K and Mg which, although incorporated into the RB209 recommendations, are many times more efficient and immediate, with the added bonus of not hitting the soil, as it is effectively taken up directly by the plant.

In-season foliar analysis backs up the initial soil analysis and the foliar programme is corrected if required.

The total cost of the programme varies between £40-110/ha depending on soil needs and nutrient requirement, plus an initial £50 a sample for the soil analysis and recommendations.

Promising results

In 2013, independent field trials company NDSM carried out a series of 64 small plot replicated trials on a crop of Melody for Branston on the Yorkshire Wolds looking at the OptiYield system. The results, according to Branston’s James Hopwood, are very encouraging.

“The commercial crop yielded in the region of 49t/ha and the OptiYield system gave a 7.3% marketable yield increase for both the nutrition and biostimulant components, with a more even size fraction.”

the 13 nutrients

Nitrogen, phosphorus, potassium, magnesium, calcium, sodium, sulphur, manganese, zinc, copper, iron, boron and molybdenum

In season there were differences between the trial and the commercial field, too.

“When it was 30C in mid-July, you could look at the trial and see the canopy was more comfortable under those conditions, so less stressed.”

The cost of the OptiYield system on the trial was £46/ha, money extremely well spent in Mr Hopwood’s view. “The return on investment for getting a 7-8% marketable yield increase means it is a system worth looking at.”

With much attention paid to major nutrients and getting those right, Mr Hopwood believes micronutrients have often been overlooked. Yet in the past two contrasting seasons – one wet, one dry – he has seen nutrient issues throughout the growing season.

“We have used foliar feeds to boost the crop from time to time within the fungicide programme, but we have never fed the crop regimentally throughout the season to match the nutrient requirement and uptake of the growing crop.

“I do think this tailored approach to managing micronutrients from the beginning and throughout the season is important.”

Encouraged by the 2013 results, Mr Hopwood is trialling the system on a field-scale level on 280ha of packing potatoes in Yorkshire and Lincolnshire this season. As before, the major nutrients – N, P, K, plus Mg and S – will be delivered through Omex suspension fertilisers tailored to variety and the OptiYield system will cover the other micronutrients.

“It is early days and we are interested to see what happens,” he says.

The results will be shared with Branston’s producer group and if the system performs well, it will be rolled out further.