Pricing position strength for potato growers

Optimism towards price negotiations, the role of innovative technology, and new tools for technical challenges were all highlighted during the recent CUPGRA potato conference. *CPM* joined delegates to find out more.

By Mike Abram

Potato growers are currently in a much stronger position to negotiate fair prices, according to Angus Armstrong, former chief executive officer of Greenvale AP.

Speaking at the 35th annual CUPGRA potato conference, he suggested security of supply is a key battleground for packers and processors to secure good, reliable growers for their raw material requirements.

This is because volatile markets during Covid, higher costs largely attributable to the Ukraine war, plus soil damage after wet harvests deterred landlords from renting out for potato production, has seen growers leave the sector.

"Consequently, I'd suggest growers are in the best position to sit down and negotiate fair and sustainable pricing that I've seen in the past 20-30 years," he said. "The crop is in demand and there shouldn't be any over-supply."

To take advantage of the situation, he stressed growers require a solid understanding of their true cost of production including storage costs, associated weight loss, and a realistic margin. "On the back of good accurate costings you don't commit to contracts that aren't viable."

PROFESSIONALISM

Strive to be in the top quartile – or at least the top half – of growers for your main customer, he added. "Every buyer wants to feed off good quality crops grown by professional growers.

"Communication is key; get input from your buyer but be proactive. Set review dates to discuss what's working in your business, their business, how you're aligned and what can be better. Don't leave it to chance," he urged.

James Green, group director of agriculture for G's Growers, provided insights for how potato growers could improve their businesses by drawing on an example from outside the sector. His pointers included investing in infrastructure and technology to improve efficiency and reduce labour costs, especially the use of automation and data-driven systems to optimise yields and reduce waste.

G's has made significant investment in digital agriculture, for example, to improve productivity as costs grew without much increase in selling prices,

Raw material requirements
Security of supply is a key battleground for packers and processors to secure good, reliable growers, suggested Angus Armstrong at the CUPGRA conference.

explained James. In fact, 10 years of development began with an initial question of how to have more crop available for customers to remove some of the peaks and troughs in supply.

Working with Microsoft Research in Cambridge led to G's initially developing its 'Ice CAM' model, using planting date, temperature and sunlight to predict harvest dates for its iceberg lettuces – helping to manage shortages or surpluses for the all-year harvest.

"Part of the forecast isn't just when, but how many, and we soon realised what we thought was in the field, wasn't," said James.

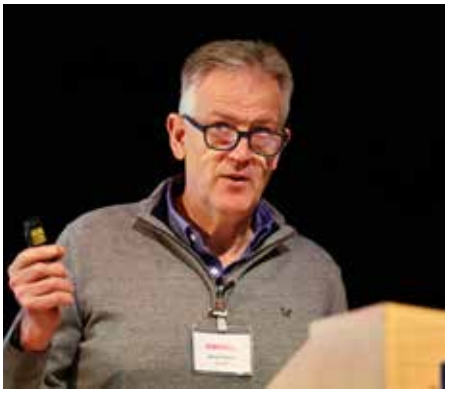
That led to work with Cranfield University counting lettuces with drones. "A 3-4% difference in establishment on 50M iceberg lettuces adds up through the season."

Next came managing size using precision fertilising technology based on a 30x30cm grid. "We can apply per plant fertiliser where we treat only the smaller plants and not the big ones, which has driven up to a 50% saving in nitrogen and created a more uniform crop."

James added that the latest project for G's uses AI and machine learning to understand and manage more factors that affect uniformity and quality. "Data is power. Hang onto yours because it's valuable and if you're not collecting it, start, because the simplest data can be powerful when you see the patterns within it," he said.

New technologies using data are also starting to gain traction directly within the potato industry. Dr Joseph Mhango, a senior lecturer in applied data science at Harper Adams University, highlighted how combinations of machine learning, remote sensing and AI could improve the accuracy of growth models used to predict yields by dynamically adjusting parameters based on real-time data.

For example, ground cover estimates could be improved using AI analysis of drone images to overcome biases in traditional methods which rely on setting thresholds for soil and plants, he explained.



Parallel learnings

G's Growers' James Green provided insights for how potato growers could improve their businesses by drawing on an example from outside the sector.

Seed supply headaches

Tight potato seed supplies are being caused by a complex web of challenges relating to production, market forces, politics and supply chain management, according to speakers in a CUPGRA workshop

Richard Baker, managing director of breeder HZPC UK, outlined calculations suggesting around 205,550t of new seed potatoes are required each season for ware production in GB.

With around 30% of GB seed potato production currently exported predominantly to Egypt, it leaves just enough area to produce that tonnage (see table below), he suggested. "There shouldn't be a shortfall with supply and demand theoretically in balance, although the reality might be different."

Brexit took away much of the flexibility within the supply chain, added Richard. "Until 2021 we could fill shortfalls by importing high grade seed to multiply or direct for ware planting. That's now either impossible or impractical.

"We could also afford to overproduce or produce on an optimistic scenario that a variety would sell because we could export to Europe."

Losing that market has made seed supply less reliable, not helped by three consecutive low yielding seasons, he added. "Equally, we have to be reliable customers for our suppliers, meaning we sell all the seed they produce. We do our planning based on average yield which is the one figure we know we won't have. But, we can't increase area simply based on low yields."

Competition for Scottish seed from export markets is another factor affecting supply with 91,000t exported last year – a figure seed grower and chair of the Seed Potato Organisation, Mike Wilson, expects will continue to grow.

He said simple economics are driving the increase, highlighting that in 2024, export seed potatoes were selling for around £565/t compared with £420/t into GB. "The cheaper crop to grow is for export, so you can see why growers are growing those varieties," he said.

Region	Total potato area (ha)	Ware area (ha)	Seed area (ha)	Region ware production area from new seed (ha)	Tonnage of new seed required @ 2.5t/ha seed rate (t) for ware	Area of seed production to supply @ average yield of 22t/ha (ha)
Scotland	22,000	11,800 (>50% farm saved seed)	10,200	5900	14,750	670
England & Wales	88,000	84,800 (10% farm saved seed)	3,200	76,320	190,800	8672
GB	110,000	96,600	13,400 (9,300 for GB use)	82,220	205,550t	9,341

Ground cover is used as a proxy for light interception within the growth model but could be replaced altogether by AI models that accurately predict absorbed radiation from satellites, he added.

A combination of machine learning and radar is helping to predict 50% emergence dates which is useful for initial yield predictions, estimating chronological age and managing irrigation for scab control, said Joseph.

"Using crop models for deciding harvest dates requires accurate dry matter prediction, but, while most models use a general conversion factor, the range of dry matter concentration in the field is wide enough to create significant errors.

"Whereas we can use machine learning to dynamically predict dry matter concentration to understand how fresh weight develops over time with respect to inputs."

Other techniques such as ground penetrating radar could be used to assess tuber size and distribution without undertaking test digs. That technology might also be useful for precision de-stoning, he said.

It's technology that could be used to help address the challenge of stone content within the Innovate-UK funded Potato-LITE project, noted Mac McWilliam, the project lead from PepsiCo.

The four-year cross-sector project is focusing on how regenerative agricultural practices, particularly lower intensity cultivation, can be implemented in the potato crop. One of the project outputs will be to use the data to create a decision support framework where factors such as end use, movement date and therefore risk of bruising, soil type and stone content perhaps determined by technology, are fed in to guide cultivation strategies, explained Mac.

Another decision support tool was introduced at a CUPGRA conference workshop, which is looking at the latest potato cyst nematode research. With a working title of 'PCN Pro', a model has been developed by PCN Action Scotland to replace AHDB's PCN calculator. Its aim is to incorporate some of the features of successful Dutch tool NemaDecide, such as a large variety database and a cost benefit analysis for different scenarios.

Users input a starting population for each PCN species, potato variety, rotation length, any treatment, region, a start or planting date and an end date for how long to run the model, explained Anglia Ruskin University's Dr Marcus Bellett-Travers.

"What it calculates is the active PCN population for each species in the soil over time as influenced by management practices, and the impact on yield."

DEVELOPMENT PROSPECTS

Currently trained on mostly Scottish data, for both calculations it assumes average weather for the region. Future iterations could allow the use of more location-specific data while the impact of cover crops on control is another factor likely to be added.

Demonstrating the model, Marcus showed how varieties with different tolerance or resistance to Globodera pallida or Globodera rostochiensis affected PCN populations over time, predicted yield impact, and the influence of other management practices.

Earlier in the workshop, James Hutton Institute researcher Dr James Price explained his latest research on the genetic basis of varietal resistance to PCN. "It's more complicated than just being two species – there are also different pathotypes within each."

A pathotype is a population that can interact differently with a host plant, usually exhibiting different virulence, he explained, which is important when considering varietal resistance particularly for G. pallida.

Streamlining processes

Ground cover estimates could be improved by using AI analysis of drone images to overcome biases in traditional methods, believes Harper Adams University's Joseph Mhango.

While typically there's a single score for potato variety resistance, that could vary depending on what pathotypes are present. For example, Lanorma, which has a resistance rating to G. pallida of six, showed good reductions in egg numbers after being grown in a Potato Partnership (TPP) trial in England but had the opposite result in a Scottish PCN Action trial.

The discrepancy in performance was likely due to the presence of different PCN pathotypes with PA2 and PA3 identified in the English trial, while it's suspected that PA1 was present in Scotland, said James. "That six score could be for PA2, PA3 but might only be a two for PA1, for example."

Such inconsistency underscored a necessity to also know the specific pathotypes in a field when selecting a variety for PCN management. To that end, the Hutton Institute is developing simple low-cost PCR tests which could distinguish between different pathotypes, concluded James.

Biostimulation beyond seaweed

Trials indicate bacteria-based Biimore delivers an increase in both tuber quantity and quality

In many cases, biostimulants are applied with the aim of overcoming abiotic stresses such as drought, waterlogging or pest damage. However, by utilising a different mode of action, it's possible to unlock further yield beyond simply offsetting, believes Loïc Della Faille of RovensaNext.

For the potato plant, this means not only a larger quantity of tubers but also improved tuberisation leading to a more homogeneous crop and therefore better marketable yield, he claims. So how's this achieved?

The company, through its subsidiary in Brazil, has developed a new biostimulant using a specific bacterial strain which is fermented and fed with sugarcane molasses, explains Loïc. "By adjusting various parameters, we can stress the bacteria to produce metabolites and exudates which then become a product known as Biimore.

"Although the fermentation process is based on a unique strain of Corynebacterium glutamicum – a non-pathogenic soil bacterium – Biimore itself doesn't contain live bacteria."

According to Loïc, when applied as a foliar spray, Biimore triggers the genes within a plant which improve photosynthesis pathways, translocation and cell division/multiplication, rather than stimulating root activity as per seaweed-based biostimulants. He says this is why the firm is seeing significant results in crops such as potatoes and sugar beet.

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"The focus is on improving quality and gaining additional yield instead of mitigating the losses experienced through crop stress," he says.

However, application timing is critical, as with all biostimulants.

"Biimore should be applied early in the potato crop's life cycle – 10-15cm (hook stage) – because as the plant grows, its response to light and therefore photosynthesis will trigger tuber initiation and we want to capitalise on that. It should be applied once and can coincide with the first fungicide application.

"Then, since it remains active in the plant for a long time, it'll also support the bulking phase. This is because of the product's ability to improve cell division, as well as efficiently translocating trace elements such as potassium to the tubers which we know helps to deliver a more consistent size," adds Loïc.

To provide suitable evidence of Biimore's in-field performance, independent trials have been underway at Scottish Agronomy, Eurofins and Prime Crop Research. RovensaNext's Bruce Morton highlights that at Scottish Agronomy's site in South Aberdeenshire last year, despite inclement conditions, Biimore delivered a 3.7t/ha yield increase compared with the control while increasing the number of marketable tubers by 11.8%.

"Then, if we look at the average across all trial sites, the yield increase is 4.5t/ha so we know this is delivering consistent results."

Although the company has been focusing on root crops so far, Biimore can be applied to a wide range of options including cereals, oilseed rape, beans and soft fruit, adds Bruce. There are also its sustainability credentials to consider, too.

"The application rate is much lower than many biostimulants on the market because of a concentrated formulation meaning a much smaller bottle – either 50 or 250ml. Translating that to the field, a 250ml bottle will cover around 20ha.

"Not only is that less packaging waste, but it's also more favourable in terms of its haulage carbon footprint. These are all aspects which have to be considered when developing a new innovation," says Bruce.

Admittedly relatively unknown in the UK market, Bruce says RovensaNext has made sustainable innovation its strategic focus. "At our core are biosolutions, with our portfolio featuring bionutrition, adjuvants and biocontrol options.

"We're hopeful that by bringing something different to the UK market with Biimore rather than another seaweed-based biostimulant, we're helping to make a step towards greater understanding of this group of products and maximising their potential," he concludes.

Potato yield uplifts
The focus of Biimore is improving quality and gaining additional yield instead of mitigating the losses experienced through crop stress, explains Loïc Della Faille of RovensaNext.