

Getting maximum value from its potato crop can save The Co-operative Group up to £600,000 a year

Introduction

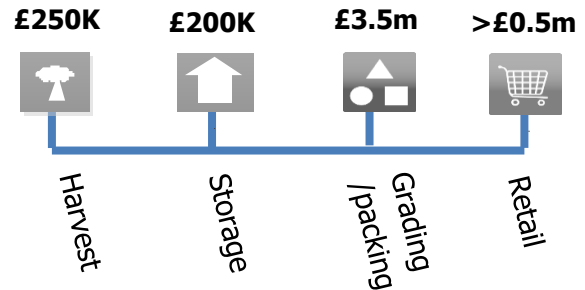
A WRAP supported 'whole chain pathfinder project' has examined potato production in The Co-operative Group from farm to shelf. The project found that significant value is lost along the supply chain and demonstrated where and how fewer resources can be used to deliver better commercial and environmental outcomes.

Key opportunities include:

- A focus on maximising pack-out rates (as well as yield) so that more of the harvested crop is available for sale to consumers;
- Less electricity can be used in storage without impacting quality, saving emissions and cost;
- Less water could be used to grow the crops;
- Reductions in material usage can be achieved by rationalising packaging and staff training;
- Transport costs, fuel and emissions can be reduced;
- Effective supply chain collaboration, for example through order timing and promotional planning, can save significant costs.



'Value' lost in the potato supply chain – (based on 50,000t packed):



Challenging Variety Norms

The study found that on average more than 15% of harvested potatoes are 'picked off' at packhouse – a significant loss of effort, resources and £ value to the business. A key factor is variety choice: further investigations found a 10% difference in average fault levels across maincrop varieties used – directly influencing the % of potatoes that are packed for retail ('pack-out' rate).

With hundreds of varieties potentially available for the retail market, there is significant potential to increase yield, quality and supply chain efficiency, as well as meeting customer needs.

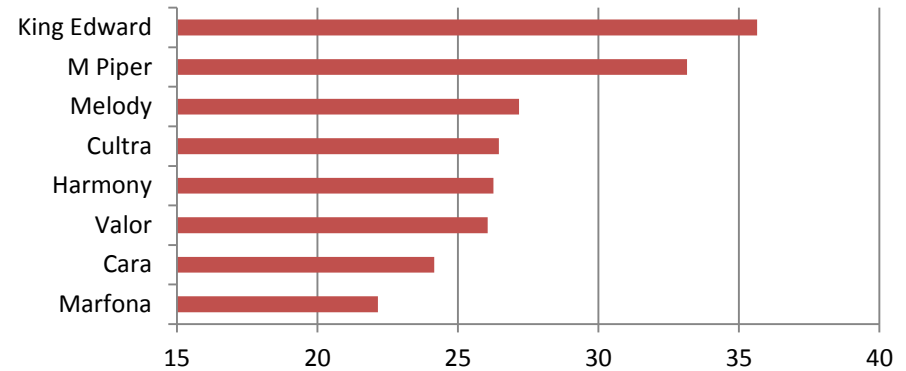
Flexing Size Bands to Increase Product Use Efficiency

Finding value in the full crop is always an overarching aim. Agronomy can maximise the return to growers by increasing the percentage of premium sizes, such as bakers and baby new. However, not all of a crop will be in these size bands and typically 5-10% are graded out for low value markets such as animal feed.

In this study, detailed analysis of the size distribution of whites, Maris Piper and King Edward in a typical crop showed the potential for reducing grade-out losses by changing the screen sizes commonly used in grading. For example, changing from a 45mm to a 43mm screen would increase crop utilisation for King Edwards by more than 5%.

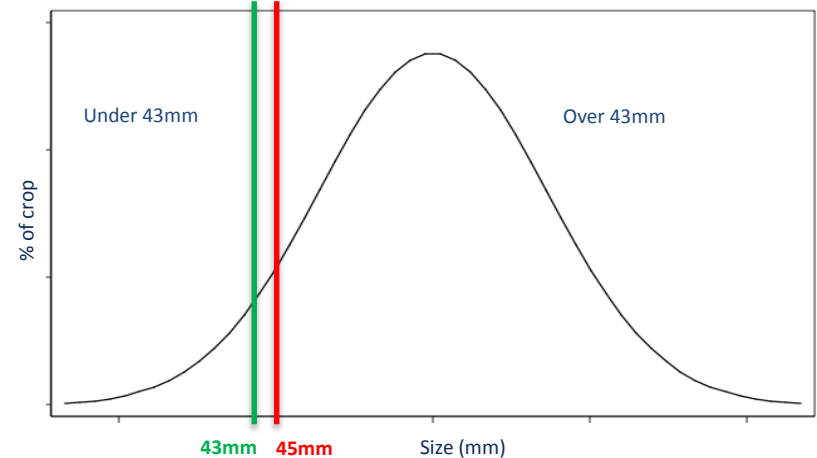
The study found that even a small flex in screen size will save in excess of £100,000 through 1000 tonnes more product used – with minimal effect on the final consumer pack.

% Faults recorded at intake



For the Co-operative's potato supply chain it was found that a increase of just 1% in pack-out will save the business £50,000.

What does reducing minimum size mean to the product?



Water and Electricity

Water and electricity are both significant inputs to the production and storage of potatoes. This study found that less electricity and less water can be used in the process without impacting quality – in fact increasing both quality and efficiency, in turn reducing costs.

With regard to water, irrigation is a major point of use. **Trickle tape** trials were held to investigate reductions in water use and impact on yield. Three fields of Maris Piper in the Borders region were analysed during 2013. The fields irrigated with trickle tape were found to require 30% less water, yield 4% more and produce a better quality product, with comparative common scab levels reduced from 28% to 4%. A resulting increase in net field margin of £400-£1000/ha was found - balanced against an increased outlay cost of £220/ha.

The favourable returns found in this study have resulted in plans for increased investment in trickle tape irrigation in 2014. 18,000 m³ water could be saved as a result.

Materials

All pre-packed lines of potatoes are packed using vertical fill formers. Wastage of film occurs due to sealing problems, reel changes, product changeovers, rip opens due to underweight bags and 'rip and tips' which result from over pack. These are typical in a packhouse operation, but simple operator refresher training, as a result of this investigation, has reduced film wastage by a third.

A review of transport & in-store packaging specifications highlighted incidences of over-specified packaging. For example, switching from card to paper tray layers, sufficient to reduce greening, will now save the business 45 tonnes of card and £40,000 annually.

Storage energy is another significant input, and cost. The energy required to refrigerate a tonne of potatoes varies throughout the year. Energy efficiency is determined by the specification, condition and management of the store itself.

The Co-operative Farms have more than 15 refrigerated stores across all of its farm and packhouse sites. The study found that if all stores were managed in line with the best, the business would save up to £50,000 annually. If all growers improved their stores to the same standard, it would save over 1,000,000 kWh per year.

Identifying and improving poorly performing stores is a key point of action, through increased monitoring and grower education.



Transport

The study found that there is potential for considerable savings in transport cost and emissions through greater packing efficiency. The need for review on a line-by-line basis was identified, with one example highlighting potential savings of more than £80,000 and 0.5 million pallet/kilometres through increasing the number of units within a tray. This needs to be carefully balanced against individual store needs, to prevent shifting waste to point-of-retail. However, the significant potential was identified, and transport efficiency will be included within future planning.



Collaboration

Joint planning with supply chain partners was found to be critical to achieving many of the efficiency savings identified – recognising that up to 3 years planning and production goes into producing each crop and significant value can be lost when promotions or orders are changed in the short term.

Reducing waste and improving efficiency through the promotional cycle was identified as a particular opportunity. Potatoes are cheapest and highest quality at harvest time. For a maincrop harvested in September, the total cost of the crop (production/harvest/storage) was shown to increase by 1/3 by March. There was also >3% weight loss through evaporation. By factoring in these storage costs and losses, the overall return from promotions can be improved. An action point is to include this information within promotional planning.

Daily timing of orders was also shown to be significant, the benefits of earlier orders including reduced re-work and fewer change-overs.

'There are substantial benefits to the site and indeed the end customer by simple changes such as moving the promotional change over from the weekend until the Tuesday order, this would mean no requirement to increase staffing levels at the weekend as we come on and off promotion at time and a half and also it would ensure fresh promotional material was in store at its best in time for the weekend trade.'

**'Bill Longair, Operations Manager
Procurement UK**

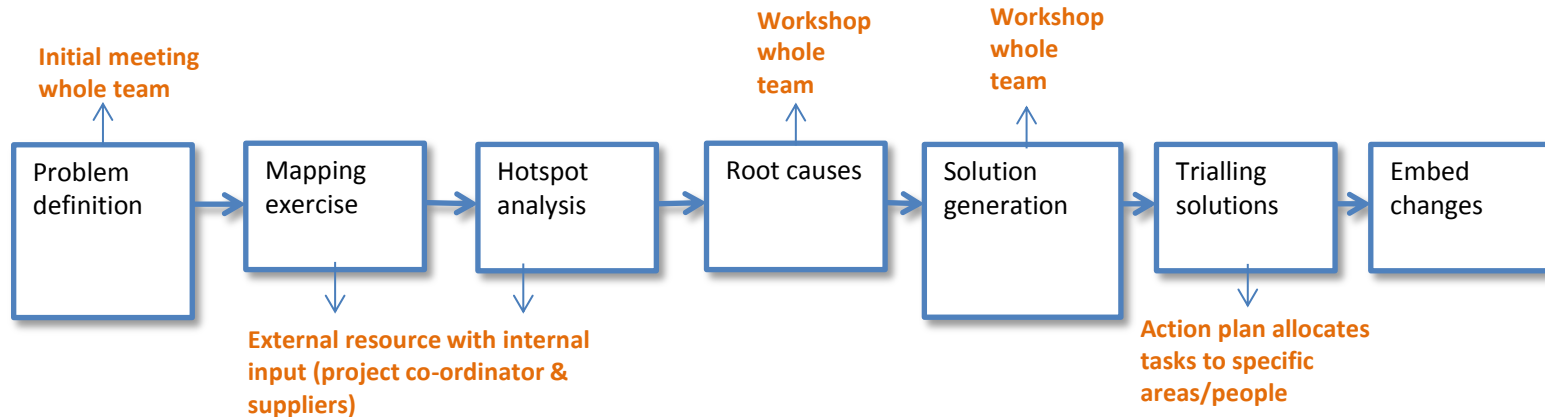
Project Method

Potatoes are grown at locations in England and Scotland both by Co-operative Farms and on contract. A 'lean and green' approach enabled us to look strategically at resource use across the whole chain. Value stream mapping was used to follow potatoes through all the stages of the value chain, detailing levels of resource consumption, waste and the costs involved at each stage.

By walking the whole supply chain, identifying root causes of loss in value, and then brainstorming solutions, the team was able to agree on improvements to generate resource efficiencies.

'There are considerable resource inefficiencies within the potato supply chain. Making waste central to the decision-making process and continuing to assess consumptions and losses in the supply chain is a significant opportunity for the business. Consideration of 'waste' in all its forms is not only good commercial sense, but it is expected by the consumers of products from an ethical retailer.'

Philip Burgess, Agronomy and Technical Manager



For more information on the approach and potential support for your business, please contact karen.fisher@wrap.org.uk