

Meeting increased demand for pre-packed table grapes

Steady growth in the worldwide production and consumption of pre-packed table grapes is presenting increasing challenges for pack house managers in terms of optimising productivity, efficiency, labour overheads and quality. This white paper reviews these challenges and outlines how low risk investments in the latest pack house technologies can significantly improve overall efficiencies.



Introduction

There is clear evidence from pack house managers around the world that the key issue for them is pack house accountability: accountability in terms of being able to keep control of large numbers of employees and measure their ongoing performance in order to optimise overall productivity.

Global fruit production has experienced a remarkable increase over the last two decades, growing at annual rates of around 3% – rates of growth that exceed most other food crops.* In 2010, almost 600 million tonnes of fruit were harvested throughout the world, with grapes accounting for around 11% of this quantity. (Statistics courtesy of FAO - Food & Agriculture Organization of the United Nations www.fao.org)

Although there are no clear statistics relating to the proportion of table grapes within this 11%, the demand for high quality pre-packed grapes is growing significantly. South Africa for instance, although a relatively small grape producer on the world stage (20 times smaller than the US), is the world's largest exporter of grapes in tonnage terms, accounting for almost 8% of the global table grape export market (80% of this goes to countries within the EU)

*Particularly strong growth rates in fruit and vegetable cultivation are occurring in food insecure and low income regions, such as in parts of Africa, South America and South Asia. This demonstrates that horticultural crop production generates high economic returns per unit of land, offering promising income prospects, especially for smallholders and when land is scarce. In addition, being labour intensive, the horticulture sector can contribute to poverty reduction by providing paid employment opportunities.

Meeting the Challenge

Packs of table grapes have to meet challenging criteria in terms of presentation aesthetics set down by the major supermarkets and retail outlets. They are more difficult to pack than other soft fruits such as berries, primarily because the fruits have to remain attached to the stem. Only a very small quantity of loose fruits is allowed in each pack.

Given the fragility and somewhat varied characteristics of individual bunches of grapes, the packing still relies on the dexterity and consistency of individual packers. The challenges are to strike a balance between maintaining target weights within the three packers' rules and minimising given away; whilst preserving pack presentation and optimising throughput productivity.

Although labour costs are relatively low in many emerging grape producing countries, it is still imperative that pack house managers can assess overall pack house efficiencies via individuals' ongoing operational performances. Gaining real time information on the performance of individual operators, especially in large pack houses where hundreds of personnel are involved, is essential to optimise productivity. However, in practice, achieving this accountability in the dynamics of a busy pack house is far from easy. In parallel, it is also essential that managers understand the so-called 'mass-balance' of their pack house to minimise waste. This involves measuring the amount of fruit entering the pack house and correlating it with the weight of finished packed product.

The Solution

The essential features for any system that addresses these operational issues are that they must be:

- Straightforward to install and implement,
- User-friendly
- Provide rapid return on investment

The grape packing process involves two distinct operations:

- Initial prepack, usually not involving the weighing of packs
- Final weight adjustment at workstations on the packing lines

In some instances, depending on the end market for the grapes, further weight checks may be carried out 'on' or 'offline' to validate 'e' weighing average weight compliance.

Predictive Packaging

Experience shows that the speed of the packing lines and therefore productivity is dependent on a wide range of factors. However a major contributory factor is the weight consistency of packs assembled in the prepack area, before they pass down the lines for final weight adjustment. Independent pack house trials clearly indicate that typically only 10% of packs leaving the prepack area have weights within acceptable tolerances, resulting in 90% needing final adjustment at the workstations. This is not only time consuming, but also generates unnecessary waste accumulation along the line.

However it is now possible to decrease the number of packs needing final adjustment by measuring and dynamically controlling the prepack weight consistency through a real time feedback system. Field trials at large pack houses show that by implementing such a 'predictive' packaging system in the prepack area, together with an effective yield control system, it is possible to achieve a four fold increase in the number of packs that are within tolerance (i.e. those needing no further weight adjustment). This translates directly into significantly improved productivity and pack aesthetics, whilst helping to minimise waste.

Mass Balance Waste Reduction

Waste is inevitable in the dynamic environment of the modern pack house, but to remain competitive companies need to minimise the impact on their business. There are essentially three sources of waste: accumulated product at work stations that can be reused, unusable waste product that has to be thrown away and giveaway/overpack in finished packs. Minimising all three has a major impact on productivity, but successful waste management requires the collection and analysis of accurate real time data from the pack house floor. The Mass Balance system provides a comprehensive measure of the total weight of product issued to packing lines from the prepack area and compares it with the weight leaving the pack house as finished product. The system also measures waste production at different stages in the packing process.

Marco's solution addresses all these issues through the use of platform scales and bar code scanners located at key areas of the pack house. Firstly the system records the total weight of product issued to each packing line. Secondly the two types of accumulated waste product at workstations are weighed and recorded. Finally the weight of finished product is recorded. From this information the system calculates overall waste production per line/per operator and levels of overpack/giveaway to give an overall Mass Balance.

This data can be used to proactively reduce and control waste levels, improve operator performance and ultimately improve productivity.

Conclusion

Low risk investment in the latest pack house technologies can transform productivity and provide clear visibility for management. This is proving to be particularly effective in large grape pack-houses where operator skill levels vary considerably. Waste reduction, improved pack quality (aesthetics) and weight consistency are direct advantages of such technologies.



United Kingdom

Marco - Enterprise Way - Edenbridge - Kent - TN8 6HF

Telephone - +44 (0) 1732 782380

E-mail: info@marco.co.uk - Website: www.marco.co.uk



Netherlands

Marco Integrated Weighing - Sprendlingenpark 23 - 5061 JT Oisterwijk

Telephone: +31 (0) 13 522 0435

E-mail: info@marco-iw.nl - Website: www.marco-iw.nl

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