Title Agricultural supply system traceability, Part I: Role of packing procedures and effects of fruit mixing

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Abstract

Traceability is becoming an integral component of modern agricultural supply chains. Higher-precision traceability and finer granularity of identifiable units of product offer the opportunity to add value to the conventional track and trace information in terms of improved feedback to producers and benefits to supply system efficiency.

The packhouse is the major transformer of identifiable units in a horticultural supply system and is the only source of information on these transformations. The major influences on the precision of traceability possible through a packhouse are mixing in the infeed system to the grader, mixing in the packing system and the splitting of fruit stream to different packing outlets.

A mixing model has been developed that is able to assign the probabilities of bin origin to individual fruit at the point they are packed into their final packs. In-feed mixing is essentially a mechanical process dependent on both packhouse design and operation. Simple design modification can significantly reduce fruit mixing and improve traceability. Packing lane mixing is a function of both mechanical design and operator factors.

Traceability is not a definitive judgement, but a variable and statistical management process with inherent uncertainty. The research suggests there is potential to implement high-precision and fine granularity traceability in the agricultural supply system.