Efficiency Gains: AI's Labor-saving Role to Modernize Operations

AI labor shortages are driving spending in automation. For potato sheds, this means updating traditional processes - often performed manually by human sorters - and seeking new ways to improve throughput, reduce costs, and drive profits.

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AI-driven sorting and grading systems, such as the SiftAI® Machine Vision System shown here, help potato packers improve processing throughput and accuracy while reducing labor costs.

The best example is artificial intelligence (AI) technologies tied to vision inspection systems used to sort potatoes. Many companies in the potato packing industry see the value AI can bring to make their operations more efficient and drive profits.

AI is no longer just an in-vogue topic in popular culture – it is a revolutionary concept that is steadily changing our daily lives. As a result, many AI suppliers have appeared in recent years, offering applications to help companies satisfy their desire to innovate. However, as these suppliers emerge, it is essential for shed operators to know that not all AI is created equal. Knowing how AI works and the right questions to ask suppliers helps companies maximize their investment.

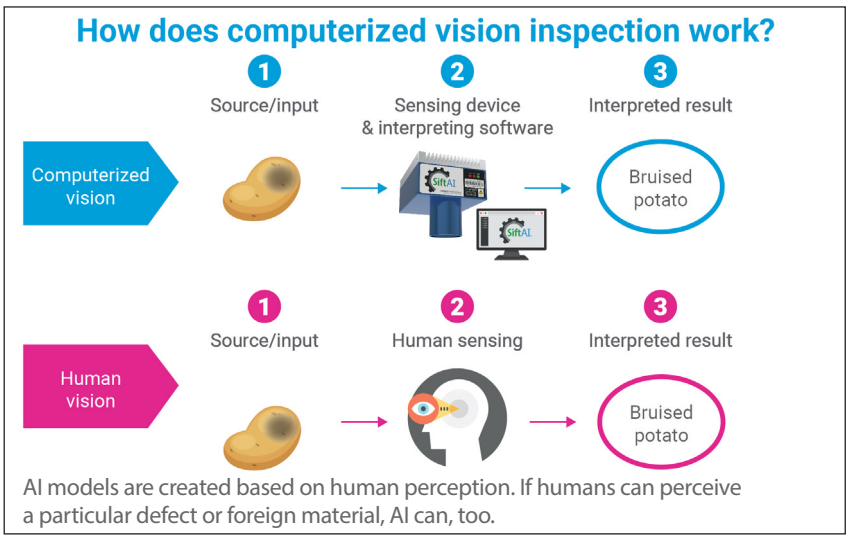
WHAT DOES THE AI INTEGRATION PROCESS INVOLVE?

AI systems in potato sheds include hardware (typically a camera and fixture) to scan products on the line, and analysis software to analyze real-time scans against pre-programmed models. Each model represents several attributes on the potato – bruises, scabs, cracks, percent green, to name a few – that could be present in the processing lanes.

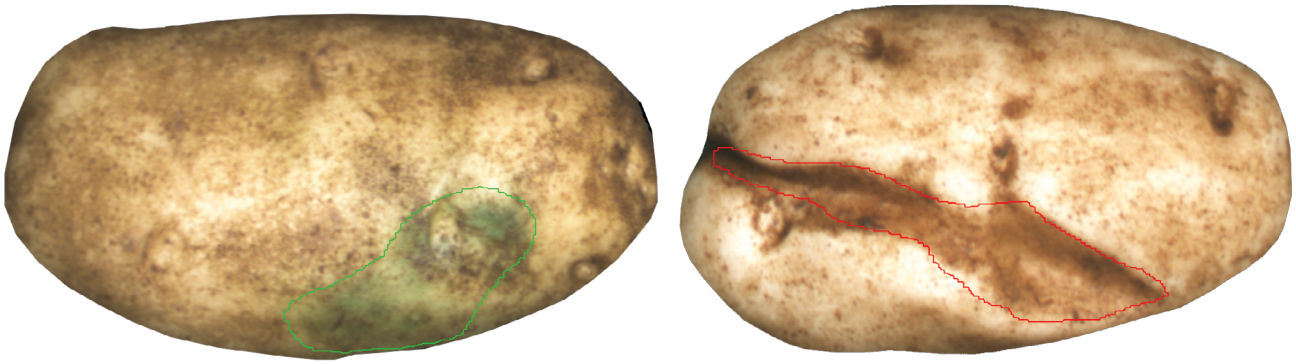
When the AI system detects a defect, it will prompt an automated rejection mechanism (kicker, sorting robot, etc.) to put the potato where it needs to go based on the operation's needs.

Most AI companies utilize "supervised training" of AI models, which is the process of showing an AI model many "correct" samples (up to 10,000 samples in most cases) but also several thousand "incorrect" samples. During this process, companies can begin to set acceptable tolerances for certain products and help drive robust sorting applications.

However, developing a dependable AI model can take many months and, in most cases, a significant investment from the user. Because of the investment risk, it is critical for companies to choose a supplier who has a track record of experience in the potato industry, has the manpower to support high throughput operations, and uses state-of-the-art tools to label and train models.



AI models are created based on human perception. If humans can perceive a particular defect or foreign material, AI can, too.



A robust AI model can more effectively segment and calculate the percentage of a defect on a potato passing on a conveyor line than a human, thus helping companies obtain quality metrics to support regulatory standards.

HOW ARE POTATO SHEDS GENERATING A RETURN ON THEIR AI INVESTMENT?

Labor Savings

Many potato sheds today are not operating at their ideal capacity because they do not have enough sorters to grade potatoes. High employee turnover, especially in sorting and quality control responsibilities, is a significant reason for this ongoing problem. This fact is especially problematic considering that most potato sorting and grading methods (e.g., sizers) still require human sorters to take measurements and correctly grade the potato. Not only do fewer employees slow operations down, but an unreliable workforce inevitably leads to errors and customer complaints (e.g., rejected loads).

It is inefficient and costly if potatoes are not graded properly. Still, many sheds cannot track this process. With AI sorting and inspection systems, however, some potato companies have been able to increase their throughput by 10-25% while reallocating their workforce, thereby boosting efficiency, and significantly reducing errors.

Stronger Standards for Sorting and Grading

With a robust AI Model, companies can develop segments for acceptable tolerances for a particular potato trait. For instance, one packer may allow for a 1% green at one period of the year, but up to 3% green at a different period. Asking a human sorter who can accurately quantify a difference of 2% green visually is a subjective task and nearly impossible to control. But with an AI system, a simple tweak within the analysis software can make this change possible and with accuracies within fractions of a percent. In addition to detecting abnormalities, most AI software gathers operational analytics, including throughput metrics and defect indices. This feature enables packers the capability to monitor the efficiency of their lines and the quality of yields from growers.

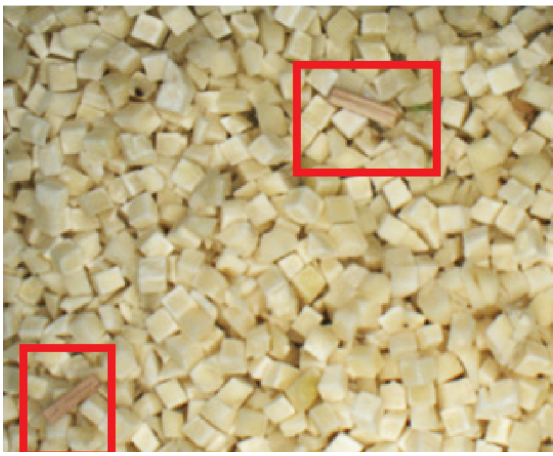
Fortifying Food Safety Standards

While used successfully in primary processing, Instantly Quick Frozen food processors (IQF) have also implemented AI foreign material detection into their process to detect foreign materials in diced potatoes. For some foreign material detection systems – X-ray being the most common – detecting objects like plastic, paper, and wood is not feasible. As AI modeling has improved, foreign material detection systems are better equipped to spot these challenging materials accurately to enhance quality control and food safety standards.

BE THOUGHTFUL ON YOUR PATH TO MODERNIZING OPERATIONS

Many potato processing brands are eager to innovate, and AI is a tool that allows companies to address workforce struggles, improve operational efficiency, and satisfy customer demands. However, successful AI applications require diligent training and continued guidance from a supplier who has experience in your industry.

When considering an AI supplier, challenge them to explain how they will create their models for your specific application. Be wary of suppliers who may advertise an out-of-the-box AI sorting or inspection system. These vendors use "unsupervised training" of their AI models, which means the AI makes its own rules and tolerances without human intervention, leading to inaccuracies and errors.



Small wood chips detected by AI in diced potatoes at an Instant Quick Frozen (IQF) processing plant.

Continuous tweaking and updates are necessary to maintain a robust model. For instance, potatoes may change in color from one year to the next, or a new defect may need to be added to the model. Having a supplier who can act quickly to deploy updates or additions to a model in a timely manner is vital to a company's long-term success.

Patience is also crucial during the integration process. Understand that creating an AI model takes time and dedication but remember that the effort put forward in the early stages of the process will pay back over time.

Integrating AI into the potato sorting and grading process prompts a significant culture change within a company. Nevertheless, reaching the full potential of your AI application is only possible with strong support from shed operators, sorters, and a trustworthy supplier. •