

Why Human Expertise Still Matters in the Age of AI

New technology means seed testing is more precise than ever, but the expertise of the people in the lab makes all the difference.



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There's a lot of talk these days about how technology — namely multispectral imaging, artificial intelligence (AI) and associated advancements — is changing the world of seed analysis.

Our team is increasingly working with a tool that is becoming more common in seed testing, and that is multispectral imaging. It allows for a deeper, more comprehensive examination of seeds, far beyond what the human eye can perceive.

By capturing images across multiple wavelengths of light, from visible to near-infrared, multispectral imaging can reveal critical information about seed health, quality, and composition that traditional methods might miss. It has completely changed what we are able to do for our customers.

That said, when people talk about these new technologies in seed analysis, I notice how quickly the conversation can become convoluted. Despite all this advanced technology, we still need talented, knowledgeable human experts in the loop — and that will not change anytime soon — if ever.

Imaging tools of all kinds are often found in seed labs these days, and the data they produce is increasingly combined with some sort of algorithm. These models are limited by the data they are trained on. We are far from the point where they can figure things out on their own, especially in niche fields like seed analysis.

Right now, we are in the Wild West of AI. The idea of AI spontaneously developing the intelligence to sort seeds autonomously is not here yet, because we need high quality data and someone to train the model.

I have worked directly on some models, training them to sort seeds and predict characteristics like purity, seed size, optical weight and even health. The process involves feeding the model thousands of images, or “blobs”, to train it.

I recently spent 30 hours identifying features and classifying just a few hundred “blobs” to train a demo model. Now imagine needing to classify tens of thousands of blobs for a more accurate prediction, which often is the case. The time and effort required are staggering. And even after all that, the model might still struggle to identify simple differences between seeds, which then calls for a re-evaluation

of features, quality of data collected, algorithm complexity and so on.

That is where human expertise comes into play. No matter how well the model performs, it lacks one crucial thing: common sense. It is simply evaluating patterns and data against the dataset it has been given as a training set.

If it predicts that a seed is of a particular species, the prediction is just a number — it does not understand environmental factors that need to be taken into account nor the real-world implications of its guess, unless specifically trained as such. It cannot identify something correctly if it has never “seen” it before. It lacks context, something only a human can provide.

Yes, the technology is advancing rapidly, and yes, it is incredibly powerful. But without a human at the controls — without the ability to see beyond the basic data and what it really signifies — AI used in seed analysis as we know it today will always need human oversight.

You still need an experienced analyst to look at the seeds, verify predictions, and provide the context that machines simply can't. It is not replacing jobs — it is evolving the way we work.

We are in a phase where AI and human analysts need to work hand-in-hand. The machine learning models are powerful, but they are not all-knowing. And while it might be tempting to think we can automate everything, human judgment is still irreplaceable. These models can only be as good as the data they are trained on, and for niche industries like seed analysis, we just do not have the vast, good quality and easily accessible datasets needed for AI to learn unsupervised.

As exciting as AI's potential is, and as important as it's becoming in everyday seed analysis, there is a balance that needs to be struck. Yes, we should embrace these technologies and push them to their limits, which our team as well as other international labs are doing. But we should also remember that they are tools, and all tools require a human who knows how to use them properly and when to use them appropriately.

The analysts — the people with the experience and intuition to interpret the data — are essential. And that is not going to change.