

INSIGHTS AND TRENDS ON
**How cannabis
production will
evolve in 2021
with the help of
Plant Tissue Culture
(PTC)**

invested in growth

Segra



**A NOTE FROM JAMIE BLUNDELL
CHIEF EXECUTIVE OFFICER, SEGRA INTERNATIONAL**

I am writing on behalf of Segra International, the first ag-tech company to offer cannabis plant tissue culture (PTC) technologies at scale. Based in Vancouver, we operate a Health Canada-licensed nursery facility and focus on delivering better nursery plants and better profits to our clients, which include over 30 LPs located across Canada and around the world.

If you haven't yet heard of it, **PTC is the process used worldwide as a best practice for almost every clonally reproduced crop, including berries and orchids, and we believe that in the coming years it will be cemented as best practice for cannabis cultivation.** PTC allows for the return of cultivars to a revitalized, clean-stock state and where they are liberated from disease organisms associated with traditional vegetative propagation methods. PTC isn't just the future of cannabis, it is a tool that is available at scale, today. Many LPs have been reluctant to try PTC, preferring to stick to the methods they have known, but pathogen risks and the possibility of permanent destruction of genetic IP can pose an imminent threat to profitability.

Over the course of 2020, I had the chance to speak with many executives within our industry and found that the insights being driven by our research are not common knowledge. To help the industry understand the immense value PTC can unlock, we've compiled this industry growth forecast outlining the ways we believe cannabis production will evolve in 2021 with the help of PTC. **Nothing could ever replace the craft and care your team puts into your grow, but with advancing cultivation technology, you are now able to augment agronomic performance in new and powerful ways.**

As we head into 2021 and beyond, the cannabis industry will finally begin to fully benefit from PTC with the availability of clean stock, true-to-type plantlets at commercial scale. This means consistent quality, better crop health and improved productivity, which lead to better financial outcomes.

I hope you find this growth forecast valuable. We look forward to partnering in your success this year!

Best,

Jamie Blundell
CEO, Segra International



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Know What You Grow™

THE FUTURE OF CANNABIS IS HERE.

In 2021 and beyond, the cannabis industry will finally begin to fully benefit from Plant Tissue Culture (PTC).

Nothing could ever replace the craft and care your team puts into your grow, but with advancing cultivation technology, you are now able to augment agronomic performance in new and powerful ways. Here are the top 5 ways we believe cannabis production will evolve in 2021 with the help of PTC.

1

Outsourcing Young Plant Propagation Will Become a Viable Option

Traditional cannabis clone propagation methods can be inefficient, costly, and prone to risk. Over time, they can lead to cultivar diminishment and the spread of disease. Plant Tissue Culture (PTC) is the solution to these problems. The trend towards outsourced propagation has already begun. In 2021 it will increasingly generate value for LPs in three ways:

Increased Efficiency: PTC will ensure that cultivars are healthy and reinvigorated with every start and reduces the risk and cost posed by viruses and other pathogens.

Reliability: Outsourcing means simply ordering a precise number of healthy plantlets exactly when they're needed and avoiding the challenges associated with mother plants and cloning.

Clean Stock: Protect your brand integrity in the short and long term against known and unknown pathogen risks. Starting with verified clean stock plants with every crop ensures the most consistent production possible and works to stop ongoing pathogen cycles in their tracks.

But not all PTC is created equal.

Some LPs have established in-house tissue labs, however, in-house tissue production is riddled with risk, unless significant investment is made in highly skilled people, equipment, and constant quality control monitoring.

Tissue culture requires a sterile, isolated environment that is totally independent of a growing facility in order to offer the full benefits of security and efficiency.



2

Desirable Genetics Will Be Dictated By Strategy, Not Availability

In new markets, THC generally dictates selling price, but as consumer preferences evolve, terpenes and other novel cannabinoid profiles will become more valuable. To date, many LPs have worked with the genetics available to them, or the current trend of the market, as opposed to looking to the future.

As the market evolves, successful LPs will be the ones that take a sophisticated and strategic approach to managing their genetic libraries.

They need to be asking: What will our core genetics be? Why are they selected? What is the strategy for future releases and how will marketing and production be aligned?

Working with an experienced partner like Segra to develop a genetics strategy will result in increased sales and consumer engagement.

3

The Threat of Viruses, Plant Pests and Diseases Will Increase

Viruses can be one of the most difficult and common challenges to detect in cultivation. Maturing cannabis markets, like California, have seen the intensification of impacts from viruses and pathogens that are causing substantial crop loss to occur. Something as simple as a tray of clones unwittingly infected with a pathogen can cause a cascading disastrous effect operationally. In more common milder instances, viruses lead to major losses in yield, weak plants, and reduced chemical expression.

Put simply, by the time you identify a virus or other new pathogen in your operation, it's too late.

Virus testing in cannabis is very new, and great caution must be taken in interpreting positive or negative tests. Many labs offering this new testing do not have validated assays to properly identify cannabis viruses present in a sample. And even if a virus is identified, there are few, if any, reliable approved treatments. The solution is to start from scratch. PTC is proven to remove 99.9% of all pathogens in a cultivar.

**4**

Yields will Continue to Increase

In numerous side-by-side comparisons conducted by Segra in collaboration with top Licensed Producers, our

PTC plantlets have shown increased dry flower yield (up to 30%) and cannabinoid contents (up to 17%) compared to "clones" produced from traditional vegetative propagation methods.

As more and more LPs embrace PTC, the greater product consistency it offers will become an expected norm for shareholders and consumers alike.

5

Mother Rooms Will Shrink

Significantly expanding your output with little to no capital expenditure might sound like a pipe dream, but PTC makes it possible. How? Outsourcing propagation reduces or eliminates the need for mother stock that inherently takes up valuable space in a facility that could be better delegated for other more productive uses. The removal of a mother plant operation is one of the greatest cost savings opportunities for a grower.

If 5% of your grow is mother stock provision, removing this workflow means lower labour costs, complexity, and expanded capacity with little to no capital spend.

In 2021, forward-looking LPs will realize that increased profitability lies in spending less time mothering mothers, and more time growing flower.





Getting started or getting to scale with PTC doesn't have to be difficult.

Segra is ready to partner with you to fill gaps in your portfolio, secure your precious IP, provide proprietary genetics, and help you to plan for the future.

If you need to protect and revitalize your existing genetic portfolio...

Segra can "clean-up" and securely "back-up" your cultivars in tissue culture through our **Regenerate & Preserve Program**. This process typically takes 5–10 months where any pathogenic contamination (virus, bacteria, fungi) are removed from the cultivar. Once complete, we can supply back clean-stock tissue culture plantlets. While this strategy can be used for clean mother stock or cultivar storage, Segra is also able to replace your existing mother space with regular shipments of clean TC plantlets using your own proprietary genetics.

If you need to introduce new cultivars to your operation...

The fastest way to begin capturing the benefits of tissue culture is through Segra's curated genetic catalogue. By way of both internal sourcing efforts and breeder partnerships, **we have over 150 unique cultivars established in tissue culture and ready to produce clean stock plantlets**. Plantlets can be ordered for either "mother stock" or "full provision" purposes of use. With this latter option, cultivators can schedule regular shipments to eliminate the need for mother plants, mother space, and traditional cloning entirely. This strategy dramatically reduces the risk and impact of pathogen outbreaks as well.

Better Plants.
Better Profits.™

Get in
touch
today.



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