Making the Most of Investments in Controlled Environment Agriculture (CEA)

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Many of us have toured farms that have just implemented new technologies. There are powerful new pumps, state-of-the-art tunnels, and fruit growing lush and ripe in their perfectly controlled environment. The successes are easy to spot and are heavily touted, but when it comes to sharing the difficulties and regrets of a new project, the discussions are decidedly shorter.

With Controlled Environment Agriculture (CEA) growing rapidly and largely funded by sophisticated investors with diverse business structures, it hasn't been just a series of success stories and triumphs. There have been numerous failures, primarily in vertical farming but also in other environments where flawed design, overly complex or unsustainable growth models have led to poor outcomes.

Talking about this openly and frankly can be difficult. As one grower put it – '*I had to learn the hard way, I'm not telling the competition how to avoid my mistakes*!' However, the presenters at this year's Protected Cropping Australia Conference had no qualms about sharing what patterns they'd noticed in both successful and unsuccessful ventures.

Over Capitalisation, Contingency and Cash Flow

Prior to the COVID pandemic, money was abundant (the cost of capital was low), and investors were seeking new and novel ways to invest. Agriculture has proven itself a stable asset class in times of a worldwide crisis1 and benefited heavily from the influx of cash. Since then, the level of investment has dropped, and funds aren't quite so freely available, but investment into CEA continues. Sophisticated investors with a diverse range of business structures are funding business expansions, technical upgrades, and new entities.

If you choose to enter a relationship with a financing partner, understand that it should be more of a marriage than a transaction; it's imperative that they have the ability to support you. Remember, banks and investors need to manage risk and may decide to strategically adjust their loan portfolios by reducing exposure to certain types of risks – not something you want to have happen mid-project!

When developing a budget, acknowledge that base financial models don't often reflect real life cashflow, and poor timing or unexpected delays can cripple a business. Likewise, it's foolhardy to run a tight financial ship based on yield and price expectations as in the world of horticulture, there are no guarantees. Your investor may need to support you for longer than initially intended. Is this something they are capable of (and willing) to do?

Lastly, every project needs a contingency fund, and this fund shouldn't be 'money that we can access at a pinch if things go wrong' but '*money that we fully expect to spend on the unexpected*'.

Who's on your team?

Nobody knows everything, and it's unlikely your existing team have the necessary expertise. While it may ordinarily be sufficient to hire for character and train for skills, when undertaking a new project with

new technology, it's essential that everyone knows exactly what they are doing. Acknowledge skill gaps and fill them with a strong and experienced team. Develop a project and business plan. Ensure that contracts are clearly scoped. During new developments or facility expansions, your Project Manager will perhaps be the most important person on your team, so ensure you have selected a qualified individual to lead the project.

Site and Layout

An existing site or farm is a tempting prospect, but will you have access to water, electricity, labour and transport networks? What about the local climate? Will this make your investment more complex and costly than it needs to be (think about trying to cool in a hot and humid region, costly and complex)?

Once you've selected a site, plan your layout. Take into consideration not only the cost of earthworks, but also the cost of running water and electricity to the project. What about site access, are you likely to require road or intersection upgrades? Have you thought about the often-ambiguous prospect of fire protection?

And don't forget staff movement. Can staff safely and easily move from one area of the site to another? How far are they from essential facilities like toilets and rest areas? Where are your machinery and fertiliser storage sheds? Given that labour is a major cost for farms, consider how quickly your staff can move between areas without wasting potentially productive time.

Pollinators are another important consideration. With berry crops either benefiting from, or requiring, pollination, what pollinators will you be selecting, and how efficiently will they perform in a new environment? Honeybees are known to struggle to orient themselves under tunnels, so hover flies, drone flies, and stingless bees may be a more suitable option.

How much is too much? And what isn't enough?

Have you been cautious during the tendering process, and identified what the 'bells and whistles' are and what is 100% necessary for the project to succeed? Compare the return on investment (ROI) for the basic package vs. the upgraded one. It's easy to fall into the position of buying kilograms (yield), but not considering the bottom-line impacts!

Overinvestment vs future proofing is a delicate balancing act, however with AI technology on the rise, autonomous tractors and advances in mechanical pickers, it's sensible to take a holistic view of emerging technologies to help find a happy medium.

Lastly, be cautious of the term 'turnkey' and you won't be caught needing to purchase batteries or accessories to make your investment functional. There are very few, if any, vendors or suppliers that can truly deliver a turnkey project inclusive of all aspects (think about factors like road upgrades, fire services, utilities connections, civil works etc.)

Sustainability

Sustainability isn't simply about going green, and you certainly can't go green when you're in the red! Economic solvency is essential for meaningful environmental action, and profitability must come first.

How will your investment manage rising electricity and labour prices? Perhaps an investment in solar or mechanical harvesting will pay dividends. It doesn't always have to be big and grand; you can shift to a more sophisticated IPDM program that reduces chemical inputs or work with water treatment solutions to reuse drain water, for example.

Understand the Consumer

Vertical farms have achieved mixed success levels. Designed to protect crops from weather conditions and provide predictable harvests, they were unequipped to deal with perhaps their biggest barrier – energy costs - which prevented them from being competitive with mainstream farming. Consumers, particularly those who have relatively low incomes, are highly influenced by the cost of produce[2].

An interesting study from the University of South Australia[3] identified that many consumers repeat purchases of fruit and vegetables in the same way that they repeat purchases of packaged goods. Brands with a smaller market share not only have fewer buyers, but have buyers who are less loyal. It's therefore sensible to understand that any niche products will need a marketing campaign to increase penetration rather than increasing consumption amongst existing buyers. If your project will be producing a niche product, do you have a sufficient marketing budget and a comprehensive marketing plan?

Want to know more?

The information in this article was drawn from Levi Nupponen's presentation at the Protected Cropping Australia Conference 2025.

Protected Cropping Australia offers access to past conference content in their members' only portal. Individual membership is $55 inc GST per annum, and $242 inc GST for corporates.

Levi Nupponen, Managing Director of Agrology Pty Ltd, leads an innovative consultancy providing technical solutions and strategic support to the agribusiness sector.

With over 20 years of expertise in protected cropping, Levi is a skilled horticultural scientist with executive training from INSEAD.

To contact Levi for more personalised advice, visit www.agrology.com.au

References

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2 https://wagrower.vegetableswa.com.au/collections/wa-grower-spring2023/what-consumers-want

3 https://find.library.unisa.edu.au/discovery/fulldisplay/alma9916242307001831/61USOUTHAUS_INST:ROR