Protected cropping in 2030

CERTIS

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How can protected cropping contribute to a more sustainable food system in the future?

By 2030 we can expect that:

Food production will need to have increased by 70%, to feed 2.3 billion additional people.

At the same time food production will be more vulnerable to extreme weather events as a result of climate change.

Food security will be high up the political agenda.

Increasing food prices may have been a factor in triggering social unrest.

With these and other pressures to be considered, sustainability is an imperative for the future of our food system. Certis Europe is a leading supplier in the speciality and high value crop market sector, providing customers with access to product choice and solutions to build and protect their business. Protected cropping, i.e. crops grown in a managed environment, usually under plastic or glass, and protected from the natural elements, is a major contributor of high value horticultural crops from salad crops, vegetables and soft fruit, through to ornamental plants and flowers. It is a system that allows for a more sustainable approach to crop management, in particular pest control.

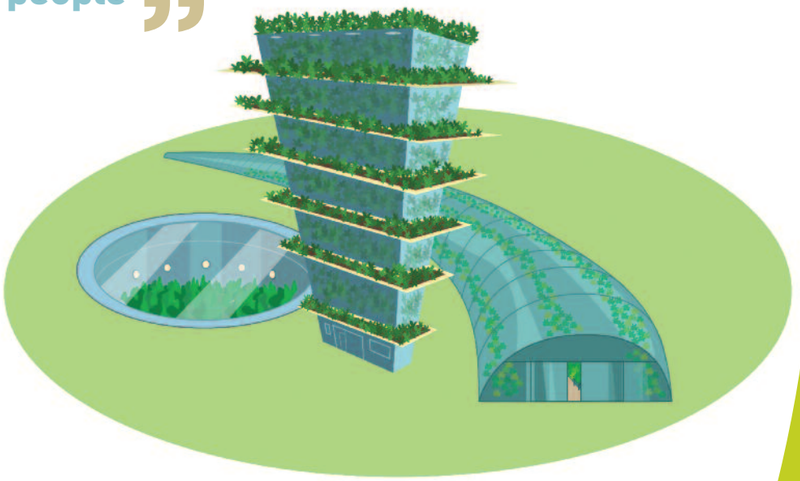
There have been significant developments in protected cropping over the last 50- 60 years, and Certis has been involved in the development of Integrated Pest Management programmes and innovative technologies which have contributed to moving the industry forward.

But how will it develop in years to come? Will more and different crops be produced under cover to protect production against the vagaries of the climate? How will the parts of the industry heavily dependent on fossil fuel energy sources, e.g. in Northern Europe, meet the challenges of sustainability? How can suppliers prepare to respond to the new order and changing needs of the industry?

Certis decided to extend its perspective for development and strategic direction and to explore the role that the company might adopt in a sustainable future, that would ensure its long-term commercial success. Having identified critical trends that will shape the future for the company Certis embarked upon an exercise to explore what the future of protected cropping might be and the contribution it could make to a sustainable food system in 2030.

> **“Food production will need to have increased by 70%, to feed 2.3 billion additional people”**

Our overriding objective has been to underpin our company strategy with a robust set of assumptions and sound thinking that will allow us to identify and pursue our strategic goals and make future investments with confidence to be fit, as a business, to respond to the demands of what will be a very different protected cropping industry in 2030.



The process

Certis Europe worked with Forum for the Future to develop four different but plausible scenarios in which to explore how protected cropping might change by 2030, with a focus on Europe.

The scenarios are not intended to be predictions or visions of desired futures. They look at how global trends could combine to change our world, and what this could mean for protected cropping.

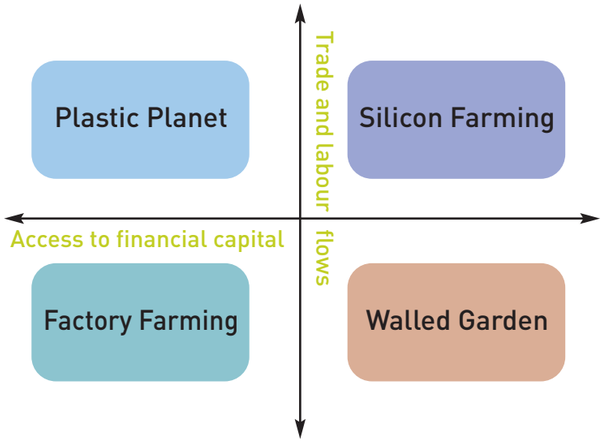
Future scenarios are an invaluable tool for forward-thinking businesses to use when planning ahead. They help identify risks and opportunities, inform strategy development, and stimulate innovation. The first step was to reach agreement on a set of drivers that will most influence the protected cropping industry. The Forum research team conducted field visits, for example to some of the largest UK growers and the key European horticultural trade show. Forum interviewed experts from within the Certis Europe business and external experts from across the value chain, including producers, marketing agents, retailers, financiers, government, and NGOs. Forum also pulled on research in the area and its own database of future trends.

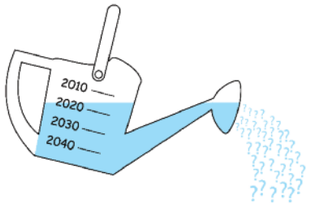
Through this research and analysis, Forum identified more than 60 trends that could shape the future of protected cropping. Through a series of workshops these trends were discussed in detail and prioritised (there is a summary of these on the next page). We then took what we considered the most important trends and least certain for protected cropping:

Free trade vs Protectionism – by 2030 will governments allow the free flow of goods without subsidies and tariffs or will they protect their own markets?

Easy access to capital vs difficult access to capital – by 2030 will capital be easy or difficult to access to invest in new technologies and infrastructure?

We used these key trends to create a two-by-two matrix, giving us a simple scenario framework, which in turn enabled us to create the scenarios.





Top 10 trends that are shaping protected cropping

Through our analysis of the drivers shaping the future of protected cropping we identified the following trends:

1 **FOOD SECURITY:** World population is expected to reach 8 billion by 2030. Will protected cropping play a more significant role in ensuring a supply of nutritious food?

2 **WATER AVAILABILITY:** Agriculture accounts for 70% of fresh water use so agricultural systems will need to adapt rapidly to increasing water scarcity. Will protected cropping offer opportunities for minimizing water use in food production expanding production in water stressed areas?

3 **CLIMATE CHANGE (OR VOLATILE WEATHER CONDITIONS):** Climate change is likely to bring more extreme and erratic weather conditions that will threaten agricultural systems and food security. Will the unpredictable weather of the future encourage more food production indoors?

4 **RESOURCE SCARCITY:** Demand for energy and energy intensive inputs like fertilizers will continue to grow with population growth and their cost increase. Will the energy intensive protected cropping industry of northern Europe be at the vanguard of alternative energy systems like Anaerobic Digestion and photovoltaic? Or will we see a shift in production closer to the equator?

5 **COMPETITION FOR LAND:** Growing population will drive up demand for land from the housing and commercial sectors. Will agriculture move towards intensive protected systems that produce more food per unit of land area?

6 **FOOD SAFETY DEMANDS:** The public expectation of safe food will continue and standards required for pesticide usage will not be relaxed. Is the protected cropping industry well positioned to respond to consumer demands through tools like Integrated Pest Management, that are easier to manage than in an open field?

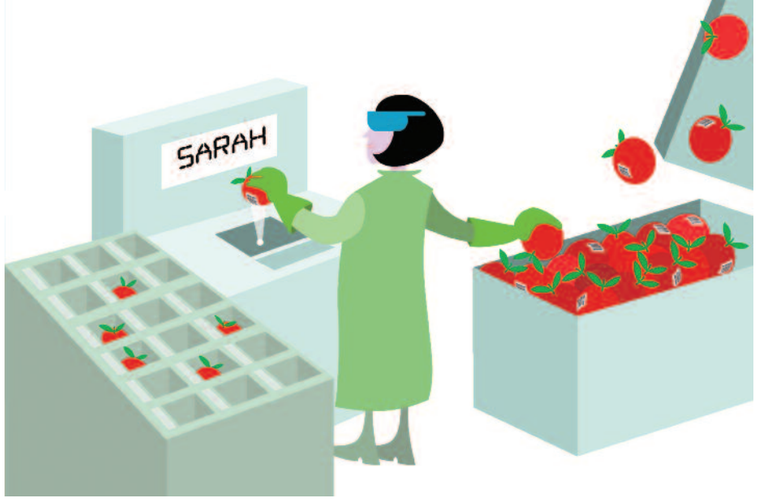
7 **PEST AND DISEASE DISTRIBUTION:** Warmer and wetter climates in the northern hemisphere are creating the right conditions for an increased incidence of tropical pests and diseases, particularly in protected cropping situations. Will the protected cropping industry have the right strategies to combat these threats?

8 **LABOUR:** High value protected cropping is labour intensive and labour is a key cost. Lower costs of labour have been a major driver in its recent geographical development. Will people still want to work in agriculture? To what extent will future governments allow labour mobility? Will labour cost differentials start to narrow between different economies?

9 **ACCESS TO CAPITAL:** Protected cropping requires considerable investment from production to storage and distribution. How accessible will capital be for investment in protected cropping, in innovation and new technologies?

10 **ENVIRONMENTAL SAFETY:** Government legislation around agriculture in developed markets is increasingly focussed on environmental safety (water directive; sustainable use directive; etc.). Does protected cropping offer a means of avoiding the restrictions imposed by the new regulatory framework and which crops are likely to be affected?

Silicon Farming



The World

Free for all.... there are few global trade barriers and cash and labour ebb and flow freely with the market. Loose regulation has led to a fast moving and expanding economy making some people rich. Consumer demand is extremely unpredictable.

Entrepreneurs rule.... finding it easy to access capital. New innovative ground-breaking technology is being developed all the time. The prolific use of technology has meant machines have replaced most unskilled work.

Protected Cropping

The protected cropping market is hi-tech, often energy and water self-sufficient and using CO_2 to feed crops.

Technology companies lead the way ..... growing systems are highly technology-based and hyper-sensitive monitors allow plants to "talk" to other technology that distributes water, nutrients and light. Pesticides are rarely used. Growing systems with low-energy lighting and water harvesting technologies allow produce to be grown in many very different situations e.g. underground, on top of buildings and in floating greenhouses. Crop handling and harvest is highly automated replacing the need for labour.

Highly personalised ..... strong consumer demand for personalised, convenient and cheap produce has led to a highly differentiated market. Growers market everything from the highest value "designer" raspberries to super-sized raspberries.

Ultra-transparency ..... on how food is grown is demanded by consumers. Communications technology facilitates that and also means that new techniques are shared and adopted quickly.

Plastic Planet

The World

Short-termist ..... economically stagnant with capital resources for large scale investment difficult to come by. Investment in innovation, R&D and large scale infrastructure is nearly non-existent. Governments remain committed to free trade as a source of future growth with limited import and export duties.

Boom in Africa ..... Sub-Saharan Africa is thriving as a result of historical infrastructure investment, expanding markets and improvements in governance that help distribute income.

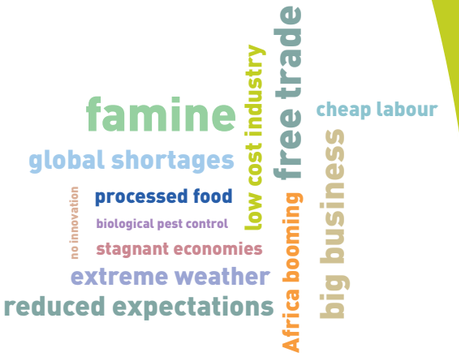
Food security is the no. 1 political priority ..... volatile climate and markets mean frequent global shortages, food price spikes and large-scale famine in the poorest regions, even hitting middle-income countries in bad years. No government holds significant food reserves so there are frequent shocks.

Protected Cropping

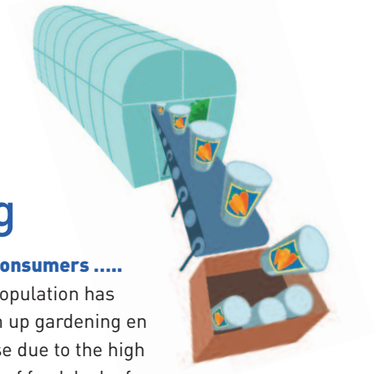
Protected cropping moves south into Africa ..... Protected cropping has grown extensively across Africa, which has even lower labour and energy costs, and secure local markets for fresh produce. A North African protected cropping cluster serves European markets. The industry is generally low-cost, using plastic polytunnels and growing crops in soil, using biological pest and disease control, often with production facilities of beneficial insects on site.

The sector is dominated by government and large agro-businesses.

Consumer expectations are low ..... food shortages have led to reduced consumer expectations around food standards with greater acceptance of blemished and damaged foods. Governments turn a blind eye to pesticide residue levels. There is less fresh food, with more being processed at origin for export.



Factory Farming



The World

Trade barriers and centralised planning ..... many countries put up significant trade barriers to support national industries and discourage imports. National economies are more centralised.

Consumer spending ..... incomes have not kept pace with increasing costs of living, squeezing consumer spending. Food prices have reached 30% of income and energy costs are high.

Governments favour nationalisation of food production ..... trust in the private sector has collapsed. Many governments take a greater responsibility for food production and farmers have become employees of the state with centralised management on what to grow and when.

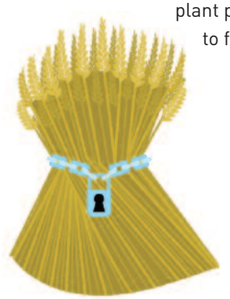
Protected Cropping

State-led Industrial farming ..... protected cropping is ubiquitous and ugly but reliable and efficient. Many of these industrial facilities are nationalised, with few barriers to development as the state plays the key role. Highly efficient closed-loop operating environments share services such as integrated water capture, storage and use; recycling nutrients; as well as setting common strategies for pest and disease management. Shorter supply chains mean less consumer packaging of fresh food and canning facilities on site to preserve food for storage, and minimise waste.

Limited consumer choice ..... large facilities supply to local markets with the most available and affordable produce, reducing the costs of logistics. Consumers accept less variety of fresh produce but still demand pesticide-free and nutritious food, partly driven by government campaigns to encourage more healthy living.

DIY consumers ..... the population has taken up gardening en masse due to the high costs of food, lack of variety, impacts of climate change and unpredictability of food supply. There is demand to learn food growing skills and skill-up in covered cropping.

Food security ..... is high up government agendas and they increasingly require big business to provide a complete food security package, from seeds through to plant protection to facilities.



automation
nutrient recycling
government control
central management
expensive food
local markets
high cost energy
nationalistic
trade barriers
water capture
closed loop operations

unrest
trade restrictions
fresh is luxury
high production costs
high-cost food
expensive labour
shortages
investment for security
vertical integration
constrained growth
colonial domination

Walled Garden

The World

Protectionism by the rich..... rich countries have strengthened barriers to protect their agriculture and industries in a world of resource constraints, military aggression and unrest.

Trade and food policy ..... is based around securing national interests. Colonial powers dominate, buying up rights to land and critical resources for their own industries and to meet the needs of their own populations. Vertical integration and quasi-colonial trading models are prevalent, heavily supported by the state.

Protected Cropping

Vertically integrated businesses ..... are developed by foreign companies who encourage investment in 'food corridors' e.g. large scale infrastructure like road building to ensure security of supply to rich countries. Retailers and huge consumer food groups are powerful players, with strategy re-oriented towards food security.

Technology restricted ..... labour costs are high as labour movement is restricted leading to shortages which increase costs of production, and in some places constrain the growth of protected cropping. However, this drives limited amounts of technology development to improve productivity further.

Fresh produce is luxury ..... no longer a staple in the majority of households. Food prices are comparatively high so consumers who can afford good quality fresh food seek and pay for high standards but there is a reduced range of products. Those who can't afford, increasingly depend on cheap imported produce, largely processed to reduce cost and preserve shelf life. The consumer base for high value produce may expand as incomes grow, but growth is limited.

'Protected' business ..... companies and countries collude to protect their supply chains, and therefore protect R&D, genetics, innovations and technology. The supply chains are global, but totally controlled by isolated silos in these rich countries. This becomes inward looking with no sharing of research and innovation.

Towards our future in protected cropping

Taking a serious and in-depth look at how an important sector of our industry may develop over a 15 year time horizon has been both interesting and valuable and is just the start of a process for Certis to ensure the long term future of its business in a fast changing world.

The scenarios have helped us to envisage the wider challenges that may impact on the protected cropping sector and to assess the risks and opportunities Certis may need to address to maintain its contribution to a sustainable food system into the future.

Among the important strategic options and priorities identified were:

- **The development of a new generation of Integrated Pest Management (IPM) to meet future cropping needs**
- **The minimisation of post-harvest losses**

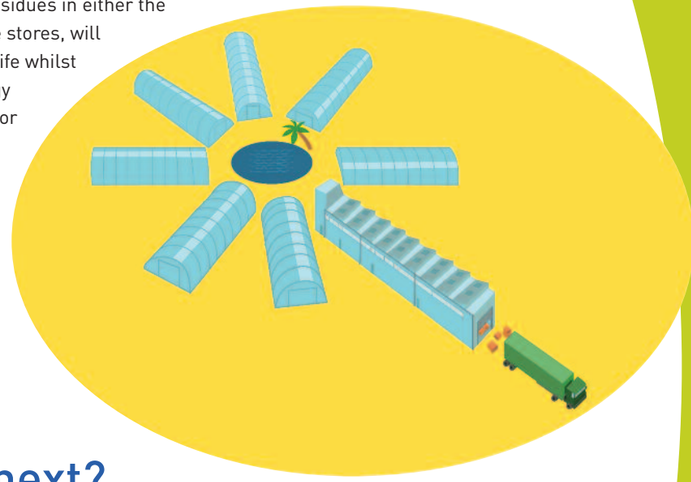
New generation IPM

As part of our core business we are constantly developing new crop protection solutions using IPM and incorporating biological, soft and conventional pesticides. For example, our team in Spain works with growers to increase security and produce vegetables and fruits with no, or lowest possible, pesticide residue levels using IPM programmes and biological controls as well as seeking the protection of the environment with low water and fertiliser consumption. They have seen success in producing residue-free crops on a sustainable basis, thereby meeting the strictest requirements of European retailers. Options for the future include the extension of IPM into different crops which may increasingly be produced in protected conditions; the development of specialist application technology; the development of new bio pesticides with improved formulation; new bio-control for seeds and for substrates. To further some of these developments we may need to consider partnerships with others offering appropriate expertise and complementary technologies to help strengthen our position and to ensure the quality of the end product through involvement in such areas as residue measurement and management, packaging or monitoring systems to justify treatment.

Post-harvest management

In a world of population growth where resources are limited it will become increasingly important not to waste food that has been produced. Post-harvest treatments to preserve produce and manage and improve shelf life will therefore be highly valued and soft technology options using bio-control products, in response to consumer demand for safe and residue-free produce, could be an area for specific development.

Certis is already active in the area of potato storage and has a package of solutions including sprout suppressants. We are working towards the addition of a new generation product based on a naturally occurring compound that will leave no residues in either the potatoes or the stores, will improve shelf life whilst reducing energy requirements for storage and increasing supply chain efficiency.



Long term planning

Some of the developments mentioned above may be achieved through acquisition or partnerships but the process of developing and registering new products certainly takes a long time and the investment required is significant so there has to be a certain level of confidence and justification for the venture. This project has delivered a robust process that offers a sound basis for long term planning and the commitment needed for the success of a long term project.

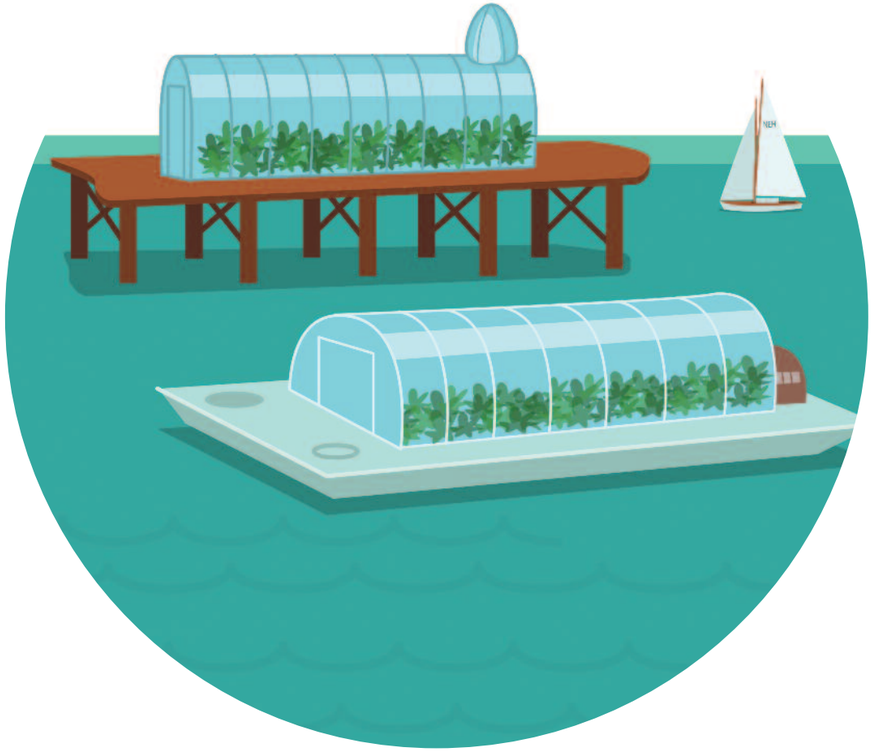
What next?

The results of our work with Forum for the Future will enable Certis to open a dialogue with key stakeholders in the protected cropping sector, sharing and testing the scenarios we have created, as part of an exploration of their views of the future. From that dialogue we hope to develop our long term strategy for the sector and start to identify the products and services we need to be evolving as well as potential partners.

Certis is committed to its future as a major contributor to the sustainable production and supply of food and must therefore prepare its offering to the industry in a changing world.

forum for the future

www.forumforthefuture.org



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