



Sustainable and Greener Horticulture via Digital High-Tech

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Evolution of trends





Fruit Factory Future

- DO WE NEED a fruit factory and why?
- What prevents us from having a fruit factory?
- What about the negative impact on jobs?
- How about the quality, nutrition, taste and environment?



Why do we need a "fruit factory"?





Promising technologies under consideration

- <u>Vertical farms</u> & wider use of <u>protected cultivation</u>
- <u>Automation</u> or improvement of decision making using meteoritical stations, sensors and other digital tools
- Drones or UAV
- <u>Subsurface</u> irrigation and <u>impulse</u> irrigation
- <u>Robotization</u>
- <u>Renewable</u> energy sources
- <u>Bio-protection</u>
- Greening logistics (pooling)
- Other important elements of tech, such as <u>AI, 2D orchards</u>, etc.



SDI and Impulse Irrigation





SDI – the gamechanger!

- Could be a huge breakthrough in all aspects we need
- Lower risks
- Less resources (all and each of them!)
- Higher yields, quality, safety
- Huge positive impact on environment!
- Excellent integration opportunities with all other modern high-tech elements

Very little experience in the region, relatively high initial investment, shifting focus to field crops and higher areas



Horti-Drones – big picture





<u>Horti-Drones – big picture</u>

- Better and faster identification of various problems
- Lower use of crop protection chemicals (CPC)
- More efficient (faster, weather independent) application
- Potential of use along the whole value chain and in protected horticulture
- Positive impact on soils

Early startup stage, focus on field crops, little or no experience in horticulture, battery life/cost challenge



Automation and decision-making improvement





Automation and decision-making improvement

- Helping resolve capacity issues
- Lower use of CPC, fertilizers, water, fuel, human labor
- Improved yields, positive impact on environment
- Fewer mistakes, better quality, lower crop losses
- Integration with irrigation, fertigation, AI

Less experience in open field than greenhouse; issues with interpretation of the results based on different locations, varieties, climates, crops; AI is more A than I.



Robotization





Robotization

- Dream of every farmer
- Around the clock operation better quality of produce, lower crop losses, lower costs

Prototype stage for most crops and operations, still very expensive, too distant future for countries with low costs of labor



Vertical farms





Vertical farms

- They do exist in Georgia
- It is the highest level of protected agriculture

Start up stage, limited variety and experience but excellent strategic potential



Pooling – green logistics





Pooling – greener logistics

- Circular economy, multiple use (ecological, lower cost)
- Less labor
- Better food safety
- Lowe crop losses and food waste
- Better export opportunities if internationally integrated

No barriers – Georgia should do it NOW



Renewables





Renewables

- Independence and autonomy + ecological aspects
- Synergy of two businesses (EC generation + agriculture)
- Energy at remote locations
- Semi- or fully protected agriculture

Expensive energy storage – solutions are being worked out



Bio protection





Bio Protection

- Let the nature do the job we will just help!
- Lots of R&D lately and significant progress
- Green Deal and Farm2Fork are new realities
- Huge positive impact on environment and soils
- Could also help improve yields and quality

Lack of knowledge, lots of stereotypes



I have a dream...

Just imagine all of these technologies combined

Late variety sweet cherry orchard fully covered with semitransparent solar panels, generating EC, which runs pumps, meteorological station and sensors, subsurface impulse fertigation, making decisions based on sensors, protected using the bio-method applied by drones picked by robots into the pooling boxes at night and delivered super-fresh to supermarket shelves by the same morning!



Thank you for your attention!

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