Early Detection of Plant Stress

Name of the Organisations Involved

- farmAIr, Greece

Challenges Identified

The ever-increasing problems facing humanity, such as population growth and climate change, are exacerbating malnutrition in many parts of the world. If we continue with the current diets and production practices, we will need an area twice the size of India to feed the world's population by 2050, based on expected population growth. Additionally, the agri-food sector, as it operates today, is responsible for a quarter of carbon dioxide emissions.

Changes in climate, including unpredictable weather events, can subject plants to stress. While higher atmospheric CO2 levels can initially stimulate photosynthesis, associated climate changes may introduce stressors.

Plant stress is a significant challenge for agriculture and can have detrimental effects on crop yields and overall productivity. This stress occurs when environmental conditions exceed the optimal range for plant growth and development. It can be caused by both abiotic factors (such as excessive heat, frost, flooding, drought, etc.) and biotic factors (including pathogens, insects, herbivores, etc.). This, in turn, increases production costs while reducing the quantity and quality of the final product.

Goals and Solution

farmAIr is a dynamic, flexible and customer oriented AgriTech company, committed to always bring cutting-edge technology and the best experience to their customers. "*Using thermal and digital cameras, machine learning and artificial intelligence, we identify plant stress at the leaf level and well before any symptoms appear, for some diseases up to 2-3 years earlier, giving the farmer the necessary time to react. This differentiates us from the international "competition" and that is why our technology has been patented, which has an international classification and application in agriculture and the environment*", says Stamatis Diavatidis, co-founder of farmAIr. At the moment, farmAIr technology is available for vineyards, planning to gradually expand to virtually any plant with leaves.

How does the farmAIr project work?

Currently, drones are employed to gather field data, providing farmers with two options:

- Integrated Diagnostic Service (End-2-End): A specialized team conducts aerial photography.
- Simple Diagnostic Service (Bring Your Own Image): Farmers use their own compatible drones equipped with thermal and digital cameras, guided by our instructions for aerial photography.

Agricultural technology and machinery companies collaborate with farmAIr team for custom software development and other related needs, with associated fees.

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Farmers can leverage this technology and the farmAIr platform, along with other services (weather data, soil data, vegetation indicators, water content, chlorophyll, etc.), to pinpoint crop issues using their mobile phones or tablets. They can then "download" the comprehensive diagnostic report for each field in PDF format, ready to be shared with their scientific team.

Source: https://www.farmair.io

Actions Taken

“Currently, farmAIr technology and services are utilized on a paid basis (annual subscription per hectare) with significant success in Greek vineyards. Since our inception, we have gained 23 satisfied partners, including the largest wineries in the country, agricultural cooperatives, nurseries, and private individuals. Our immediate goal is to gradually expand to the traditional wine-producing countries of France, Italy, Spain, Portugal, Chile, Argentina, South Africa, Australia, and California. Our next objective for the agricultural market is to extend our services to other crops," says the company's co-founder.

FarmAIr is actively pursuing collaborations with other agri-tech and agri-product companies. The company has recently signed a memorandum of understanding with a greenhouse company looking to expand into open-field crops. Additionally, FarmAIr is in discussions with indoor vertical farming and smart tractor companies to establish partnerships, exchange or co-develop new technologies, and foster mutually beneficial commercial relationships that will establish it as a reliable partner for international operators and companies.

Moreover, in a notable development, farmAIr has recently signed a Memorandum of Understanding with the largest of these satellite-launching companies, and negotiations are underway with two others.
Contacts are being established with insurance companies and international certification bodies to facilitate the use of the technology and its services in the field of agricultural compensation and mapping challenges in significant agricultural areas worldwide. Although farmAIr is currently specialized in vines, expansion to cover more crops is on the horizon.

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Benefits and Impact

Using thermal and digital cameras, machine learning and artificial intelligence, farmAIr identify plant stress at the leaf level and well before any symptoms appear, for some diseases up to 2-3 years earlier, giving the farmer the necessary time to react.

Growers can manage plant stress, prevent disease transmission to the healthy part of their field, saving (on average) around 35% of treatment costs, and manage irrigation, fertiliser and pesticide use in a better and more targeted way, ensuring the health of their crops, increasing the efficiency and quality of production, and applying sustainable farming practices in line with the requirements of the Common Agricultural Policy and the United Nations Sustainable Development Goals.

Contact Information

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Application Area

☒ Soil ☒ Plants

Digital Technology in the Value Chain

☒ Supply-Chain Management ☒ Agronomic Services

Digital Technologies

☒ IoT ☒ Drones and AGVs

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