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CRACK SENSE

High throughput real-time monitoring and prediction of fruit cracking by utilising and upscaling sensing and digital technologies

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OBJECTIVES

CrackSense will upscale sensing technologies to monitor fruit cracking and yield loss at the fruit, tree, plot and regional levels, and to integrate this data with agri-environmental monitoring data, in order to generate models for predicting cracking incidence and risk at the fruit/plot/regional/country levels for a given year.

1- Upscale sensing technologies to collect data at the fruit, tree and plot scales, to enable real-time monitoring of fruit cracking, estimation of yield loss, and assessment of risk of cracking incidence. CrackSense will upscale sensing tools to provide data for assessment of cracking risk at tree level, plot level and regional level. CrackSense will enable real-time identification of external changes associated with cracking and fruit developmental processes.

2 - Create agri-environmental datasets relevant to fruit cracking by combining and processing-at-the-source (edge computing) multi-source / multi-modal data collected through sensors used in agricultural production and Earth Observation data. CrackSense will create data sets collected by sensors in different places and scales, and upscale them into EU-wide data sets which will encompass Earth Observation Data (provided by Copernicus, e.g. Senitnel) and other data sets reflecting on environmental conditions.

3 - Develop models and SDSSs to estimate the risk of cracking by integrating regional cracking incidence data with environmental and climatic data, and with data collected through sensors used in agricultural production and earth observation data. Cracksense will contribute to understanding the effect of climate and other environmental variables (topography, agronomic means, etc.) on the risk of cracking using regional climate models. CrackSense will develop SDSS which will enable better management of farmers' resources, by knowing the expected risk of cracking.

4 - Upscale the sensing and analysis tools developed, to asses the risk of cracking incidence through piloting activities in a number of agricultural crops in a wide geographical region. CrackSense will validate the utility of the sensing tools and models in commercial fields through piloting activities.

5 - Disseminate, communicate CrackSense results, develop business models and support policy makers in further deployment of digital and data technologies. CrackSense will contribute to the uptake of sensor technology in agricultural systems through tailored dissemination and communication activities.

EXPECTED IMPACT

IMPACT 1: Innovative governance models enabling sustainability and resilience notably to achieve better informed decision-making processes, societal engagement and innovation. CrackSense will improve the data and tools for decision making in yield loss and create a sustainability monitoring system empowering real time monitoring.

IMPACT 2: Green Deal related domains benefit from further deployment and exploitation of Environmental Observation data and products. CrackSense will implement mechanisms for integration of agri-environmental data sources to support policy makers in assessing and monitoring real- environmental performance indicators.

IMPACT 3: A strengthened Global Earth Observation System of Systems (GEOSS). CrackSense aims to leverage GEOSS for new agricultural applications, unlocking previously unexploited opportunities for sharing environmental data from a vast network of observing systems.

IMPACT 4: Sustainability performance and competitiveness in the domains covered by Cluster 6 are enhanced through further deployment of digital and data technologies as key enablers. CrackSense will undertake the CrackSense Solution and cooperate with complementary projects, initiatives and DIHs to tap into a pan-European network of DIHs and AKIS actors.

IMPACT 5: More informed and engaged stakeholders and end users including primary producers and consumers thanks to effective platforms such as AKIS. CrackSense will involve stakeholders through interactive demonstrations of sensing tools on farms, providing impartial and customized guidance for sustainable management decisions.

IMPACT 6: Strengthened EU and international science-policy interfaces to achieve the Sustainable Development Goals. CrackSense will equip policy makers and regulators with necessary tools to break out of science-policy silos and accelerate progress towards the SDGs.

