Christopher Nankervis // Weather Logistics Ltd., 2021

# *Cost-Benefit Assessment of Seasonal Forecasts for Fresh Produce*

Weather Logistics' main challenge is in evaluating the cost-benefit of its seasonal forecasts. Tailored for grower co-operatives and producer organisations (POs), these 2 to 15-week daily weather outlooks are delivered as a 50-member ensemble at a farming level. Initial market evidence indicates that forecasts of this type can support supply-demand optimisation, helping to ensure adherhence to fresh produce delivery programmes. Other positive impacts include reductions in fresh produce waste and its associated input costs, and better optimised fresh produce marketing and logistics. For example, one PO may supply 80% of the marketable salads to Waitrose. In these cases, the overproduction margin may reach 30% to compensate for the 'worst case' adverse scenario of seasonal weather. Preliminary data suggests that seasonal forecasts could save up to £1 million in this case.

Market prices of some soft commodities fluctuate from volatility in supply and demand – mostly a result of weather variability. Shortfalls are often met with overseas imports, costs that are covered by the grower group or PO. To streamline this process, their current approaches include real-time crop monitoring (drones, visual scouting of fields) and weather history (fixed weather stations) to predict the quality and timing of harvests (using crop or supply/ demand models). Decisions at the start of the growing process however are made on a standard year (such as the past 5 year's climate for instance) as a best guess of the expected progression of weather conditions. Seasonal forecasts provide an added benefit to improve upon these current operations.

Weather Logistics has attempted its own internal assessment of the economic value of seasonal forecasts (March 2021). This was based on several assumptions: i) the forecast accuracy (7-month trial) directly within field, ii) supply-demand balance calculations (figures used fixed input costs/ sales price that is not realistic), iii) grower specific variables (crop type, location and exposure to weather losses) iv) unknowns about the capacity to make actionable decisions (we estimated this was 2 to 3%). Together, these factors make the value of seasonal forecasts poorly quantified and most likely highly dependent on the specific agricultural business.

The ideal outcome would therefore be an adaptable cost-benefit system based on a set of baseline financial information (questions) collected from the clients. This would avoid the need for expensive and time-consuming field trials for each market segment.

# Further information.

Our target audience is growers of speciality field vegetables, salads and high-value horticultural crops operating both in the UK and Spain. While the UK growing season is limited by season, Spanish growers can also operate production almost all-year-round if they manage a diversity of farm sites at different altitudes (usually on lease). We assume that international trade can take place between these geographical locations to fulfil the total British market. Given the geographical provision of seasonal forecasts, Spain-UK trading options could be assessed.

Weather Logistics has provided information for several crops to test a crop/ economic models for cost-benefit assessment.

# What will we provide?

- Retrospective seasonal forecasts for the last 6 years (2018 to 2020) and March 2021
- Daily weather data at a selection of UK & Spanish farm sites
- Within-season coverage from March and September (7-month growing season)
- Observation data for the same locations and times
- Climatology reference data for the same locations and times
- Growing conditions for 'temperature' dominated crop types

# Key Assumptions.

- Fresh produce is perishable and cannot be stored
- Most interannual volatility in crop yield is associated with seasonal weather

# References.

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