

PRACTICE ABSTRACT n° 26

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Cooling blanket

Cooling fresh produce extends shelf life and reduces food loss. While active cooling is not possible without a current stream of electricity, passive cooling can cool as much as 5-7°C below ambient temperature in certain environments. Within the Foodland project, Agroscope refined the charcoal cooling blanket a proposed solution by Agroscope's partner EMPA (Ref1), tested various designs in climate chambers and validated the best designs in Uganda in collaboration with Makerere University (Fig1). The validation showed an average reduction in temperature by 1.5°C and an increase in humidity by 10% thereby reducing shrivelling, firmness loss and fungal infections of fresh produce. Through these effects, tomatoes can be stored for an additional 2 days, an increase in shelf life of 60% (Ref2). Versions of the cooling blankets were then sent to Foodland partners in Tanzania where tests on avocados showed a reduction in food loss of 7%, an increase in shelf life of 2- 6 days or 60% and a reduction in weight loss of 8%.

The scalable nature of the charcoal cooling blanket allows for scaling sizes to transportable units such as single crates that can be transported on motorcycles – a common way of transporting small goods in eastern Africa- to markets reducing food losses along entire supply chains (Fig2). A test run in Uganda revealed an increase in shelf life by a factor of 2.5 when compared to transport and storage in a regular crate.

Farmer surveys by FoodLAND partners in Kenya showed that 75% of farmers answered “extremely likely” when asked how they would rate the adoption of the cooling blanket technology. Economic analysis showed an estimated return of investment (ROI) of 15% and a profit margin of 13.04% for producing and selling cooling blankets and a discounted cash flow analysis over ten years operation showed an Internal Rate of Return (IRR) of 45%.



Figure2. The charcoal cooling blanket during transport and at a local farmers market.



Figure1. Assembled charcoal cooling blankets at Makerere University's research station Uganda

¹Ref1: Defraeye et al. 2022, EngrXiv, doi : 10.31224/2221

¹ Ref2 : Felicioni et al. Submitted to Food Security