

PRACTICE ABSTRACT nº 27

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Agroscope

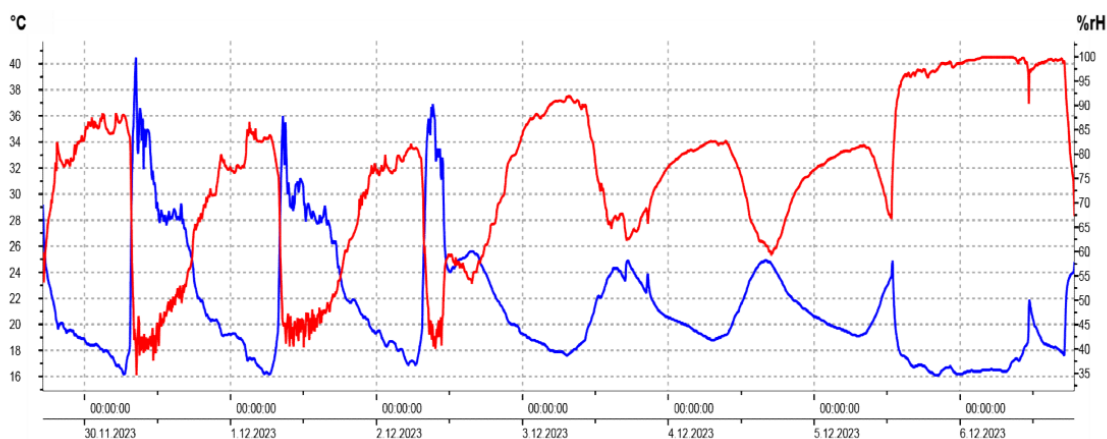
Smart cooling of fruits and vegetables

Kenya experiences hot tropical temperatures often above 25°C and in such circumstances, fruits and vegetables lose water rapidly and dry fast. This is a problem for farmers and market vendors and other actors in the value chains who would like to sell their produce fresh. It is estimated that over half of the fruits and vegetables are spoilt before sale.

Agroscope developed a smart storage system. It is a cold storage innovation that involves placing charcoal in the folds created using gunny bags. The charcoal loaded bag is then wrapped around a crate containing vegetables. Water is then poured on the bag and is absorbed by the charcoal. During the hot parts of the day, the water evaporates from the charcoal and creates an evaporative cooling effect inside the crate to prolong the shelf life of the produce. The technology targets market vendors who lose fruits and vegetables due to unfavourable conditions at the market. The technology has been tested in Uganda and will now be tested in Kenya and Tanzania for comparison.



Instrument name: TR 05		12/6/2023 6:49:23 PM			Page	1/1
Start time: 11/29/2023 5:08:00 PM		Minimum	Maximum	Mean value	Limit values	
End time: 12/6/2023 6:48:00 PM		Temp-C [°C]	16.1	40.5	21.366	10.0/70.0
Measurement channels: 2		Humid-C [%rH]	34.6	99.9	75.501	20.0/80.0
Measured values: 2037						
37323426						
values 2						



The results of tests performed on this technology are very promising. This can be seen in Figure 1 where the device was run without water (therefore no evaporative cooling) for first 3 days and with water for the last 3 days. The tests were carried out in the hot and dry month of December it can be seen that without evaporative cooling (first three days to the left of the diagram), the temperature in the storage can reach 40°C, which is a combination of solar radiation and respiration of the produce. However, when evaporative cooling was introduced by simply sprinkling water on the surface, the temperatures fell to below 20°C and the relative humidity rose to above 70%. Both of these are very good for increase the shelf life of vegetables.