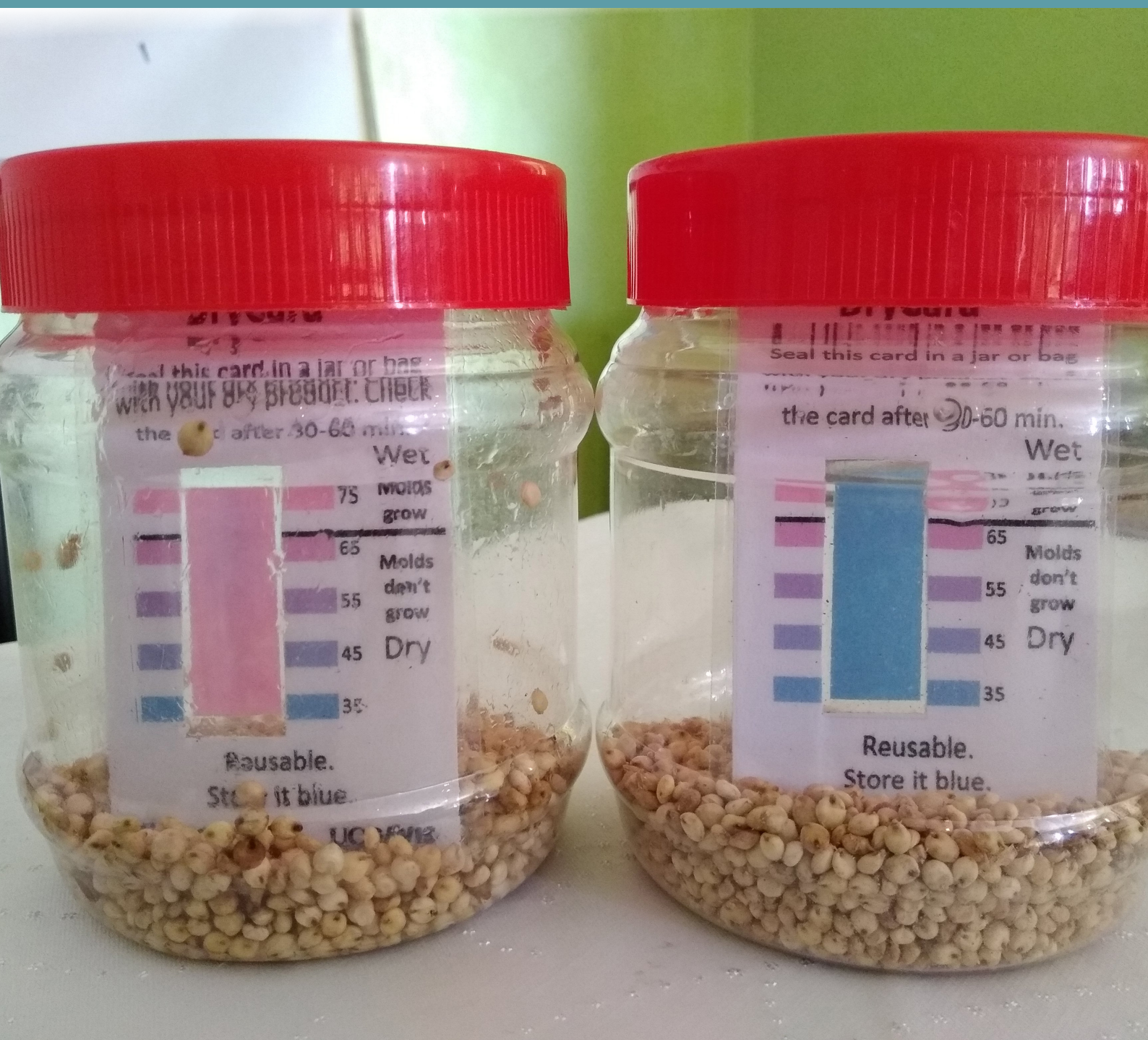


### Dryness Indicator Card (Dry Card)





# 1. Pioneer partnership

The Dry Card innovation was piloted in the Sorghum partnership (Nigeria) in 2018 with aggregators including NALMACO Nigeria Limited and Adefunke-Desh Varieties Limited (Adesh). These aggregators together supply more than 3,000 tons of white sorghum to Nestlé, annually. Their joint ambition is to reach at least 15,000 smallholder farmers producing and supply 10,000 tons of high-quality white sorghum grains (free of mycotoxin and pesticide contamination) to Nestlé by 2023, and through this create shared value for actors of the supply chain.

To meet the high-quality standards required by Nestlé, farmers had to ensure their produce was properly dried to reduce the incidence of aflatoxin and other mycotoxins, which are the two main quality issues identified. Traditionally, farmers use various ways to determine the dryness of their grains, including by cracking using their teeth or sniffing it directly. These methods are unreliable and may give a false impression of the level of dryness, resulting in high risk of aflatoxin contamination. On several occasions, Nestlé rejected sorghum supplied by farmers due to aflatoxin contamination. To ensure that farmers accessed the Nestle market, there was the need to introduce a more effective process of determining grain dryness to reduce the risks associated with aflatoxin and mycotoxins.



Sensitization of DryCard usage to smallholder farmers

## 2. Replicable practice

The dryness indicator card (Dry Card) is a frugal moisture meter used to determine dryness of food prior to storage. It comprises a printed card and a strip of CoCl<sub>2</sub> Relative Humidity (RH) indicator paper. The strip of CoCl<sub>2</sub> changes color based on the level of dryness of the tested grain/food product. A colour reference scale is printed on the card to indicate the moisture content of the product. This enables farmers to dry their products to levels safe for storage. Compared to a conventional moisture meter, the dry card is simple and inexpensive (approximately USD1) and can also be used to test several crops. With proper storage, the card can be reused several times.

Dry Card was invented by Michael Reid and James Thompson at the University of California (UC Davis). 2SCALE collaborated with UC Davis through their Horticulture Innovation Lab to pilot the innovation in Nigeria in the sorghum and maize value chains in Kano, Kaduna, and Katsina. Actors that participated in the pilot included smallholder farmers, aggregators (local and regional), and input companies. The tests were done at farm' level and at aggregators' warehouses. Following the positive feedback from the pilot, it was replicated in rice in Côte d'Ivoire, and is currently being replicated in Ghana in the sorghum/Faranaya and maize/Kedan partnerships in collaboration with a local manufacturer, Abraham Ofori Agrochemicals.

To summarize, this practice is addressing constraints in terms of:

Access to nutritious food	<ul style="list-style-type: none"> <li>• <b>Appropriateness:</b> Aflatoxin and other mycotoxins are major food safety issues with health-related consequences if present in unsafe levels. Smallholder farmers in the partnership, who are the main producers of sorghum have improved quality by adopting the Dry Card. This has contributed to improved food safety for consumers while also strengthening market access for farmers.</li> </ul>
Inclusion	<ul style="list-style-type: none"> <li>• <b>Voice:</b> With Dry Card, farmers can assess moisture content of their produce and make decisions based on this knowledge (i.e reject grains with high moisture before they are supplied to aggregators). When farmers improve the quality of their produce, they can better negotiate for good prices with buyers and could also benefit from premium prices. This is even more relevant where farmers are properly organized into cooperatives and perform additional functions including community level aggregation.</li> <li>• <b>Ownership:</b> Farmers become empowered and play an important role in the quality management process, by proactively assuming responsibility for ensuring the right moisture content is achieved at their level. They do not only rely on aggregators/buyers to determine these parameters.</li> <li>• <b>Risks:</b> Rejections are less likely when farmers are able to test for moisture content of their produce. This reduces economic risks and ensures farmers access market and make higher incomes.</li> </ul>

# 3. Preconditions for replication

## **An entrepreneur to produce and distribute the cards locally**

Being a fairly new technology, deliberate efforts are required to promote local production of the cards, and effective systems of distribution in place to ensure farmers and other interested users can have access to them. 2SCALE received Dry Card samples from UC Davis for the pilot in Nigeria. Input dealers that participated in the pilot expressed interest in serving as manufacturers and distributors locally. The cards are still imported and there are plans to leverage the interest expressed by these input dealers to start local production in Nigeria. This is required to ensure that cards are readily available and at a price that is affordable to the interested users. Since the margins on the card are relatively small, it is best to identify and work with active input dealers who already have existing networks through which they distribute also other products.

## **Steady supply of $\text{CoCl}_2$ strips**

Except the  $\text{CoCl}_2$  strips, all other materials needed to produce Dry Card can be sourced locally. To ensure uninterrupted availability of the Card, it is important to ensure enough strips are imported (until local options are identified) to sustain production.

## **Protocol on use of Dry Card**

For well-organized cooperatives, a protocol to guide how this is implemented is required to ensure proper use and maximum impact. This protocol spells out various roles and responsibilities of cooperative members. Capacity building should be organized both at community and cooperative levels. The use of Dry Card alone is not enough to prevent post-harvest losses. Other post-harvest management practices such as hermetic storage bags should be incorporated into the training.

## 4. Results Achieved

- Percentage of sorghum meeting quality standards (including aflatoxin) of Nestlé improved from 88% to 99%.
- Enhanced trust and transparency among farmers, aggregators, and Nestlé.

## Want to know more?

To know more about this practice, please reach out to Alhassan Issahaku, [aissahaku@2scale.org](mailto:aissahaku@2scale.org) the 2SCALE Inclusive Green Innovations Coordinator.

You can also read more on this case through the following resources:

- <https://www.2scale.org/en/updates/dry-card-technology-reducing-post-harvest-sorghum-losses-en>
- <https://www.2scale.org/en/training-what-who-how->
- <https://horticulture.ucdavis.edu/information/new-low-cost-indicator-food-dryness-drycard>
- <https://www.youtube.com/watch?v=imSYYwQXpcQ>

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