

Precision agriculture for increased farm productivity and resilience: fertilizer micro-dosing



1. Pioneer partnership

Microdosing was introduced in 2017 among sorghum farmers supported by Nestle in Nigeria. Nestle sourced sorghum from smallholder farmers through two main aggregators, Nalmaco and Adefunke Desh. In 2019, these aggregators assumed leadership of the partnership in a syndicate. Nalmaco and Adefunke Desh are large scale regional grain aggregators based in North Western Nigeria off-taking 35,000 tons white sorghum from SHFs and local aggregators/middlemen. They add value by grading and cleaning grains before supplying to large scale processors including Nestle, Honey Well and Cadbury. The partnership aims to empower sorghum SHFs through the adoption of GAPs (Inc. Postharvest management practices) and access to inputs to enhance production and supply of high-quality sorghum as well improve household nutrition by offering foods rich in micronutrients for BoP consumers.

Farmers in the network of these aggregators face enormous constraints some of which include; inadequate access to productive resources such as improve seed, fertilizer, agro-chemicals, land and land preparation services. Changes in climate has also become a limiting factor in the production of sorghum. The combined effect of these constraints results in low productivity which affects the availability of sorghum for food and as a source of income. To address soil and plant nutrition constraints as a means to improve farm productivity, 2SCALE supported the establishment of demonstration farms to introduce fertilizer micro-dosing techniques to smallholder farmers.



Fertilizer microdosing - a little goes a long way

2. Replicable practice

Fertilizer micro-dosing is a localized application of small quantities of fertilizer at planting, after germination or as top dress, practiced by many small scale farmers in Africa. It is a form of precision farming technique that enhances fertilizer use efficiency and improves productivity. In the practice small doses of 2-3 g of fertilizer, about a full bottle cap or a three-finger pinch is applied at the right place near the crop and at the right time. This technique uses only about one-tenth of the amount typically used in the ordinary fertilizer application methods such as broadcasting.

Demonstration farms were established to train farmers on how to micro dose fertilizers. Other good agricultural practices and complimentary soil fertility management techniques were incorporated in the trainings. These included land preparation, appropriate planting, intercropping, use of organic manure, and responsible use of herbicides and general plot maintenance.

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<p>Access to nutritious food</p>	<ul style="list-style-type: none"> This technology is boosting production, improving crop tolerance to drought and temperature stress, and improving plant nutrient use efficiency. This improves yields and nutritional quality of crops, hence increasing access to nutritious sorghum and sorghum products.
<p>Inclusion</p>	<ul style="list-style-type: none"> Ownership: The technology is open source and available for dissemination to farmers with training. Voice: Farmers who have been trained on the Technology have been empowered and have been able to reduce their input costs as well as increase their yields. Risks: the risks of losing fertilizers to run-off is reduced when farmers practice micro dosing. Rewards: Increases crop yield, reduces cost of production, crops mature rapidly and are more tolerant, reduces wastage of fertilizers, it can be integrated with other interventions.

3. Preconditions for replication

Protocol for demonstrations

To replicate this technology a detailed protocol to ensure consistency of use and results has been developed. Training of extension staff to support its implementation and training of farmers is key. A template to measure the economic benefit of the technology has already been developed.

Access to improved seeds and quality fertilizers

Micro dosing must be complemented with the use of improved and certified seeds to achieve optimum yields. Fertilizers must also be procured from trusted sources and if available, site specific fertilizers are preferred over blanket/general use formulations.

Strong grassroots mobilization for demonstrations/trainings

To accelerate adoption of micro dosing technology, strong agribusiness clusters are required to mobilize and coordinate farmer participation and trainings. Additional labour may also required due to the method of application in micro dosing. This must be anticipated and planned for prior to adoption.

4. Results achieved

- More than 3,000 farmers (including 35% women) trained in micro dosing and other good agricultural practices.
- Sorghum yields increased from 0.9t/ha to 1.8t/ha and about 40% increased in income was recorded.
- Adoption rate of 32-40% reported.
- Fertilizer use efficiency was also enhanced, thus making the practice eco-efficient.

Want to know more?

If you want to know more about this practice, please reach out to Alhassan Issahaku, aissahaku@2scale.org, Dairy Partnership Facilitator in Nigeria.

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