

Why microbes are key to solving Africa's food security crisis

By [Esther Ndumi Ngumbi](#)

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[AgFunder](#), an online investment platform, just announced its [innovation award winners](#).



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Topping the list was [Biome Makers](#), a startup company that takes advantage of the natural agricultural microbiome-community of microorganisms. It does this by testing soil to determine what microbial species – microscopic organisms such as bacteria – are present. It then uses the information to offer recommendations about how to improve the quality and yield of the crops.

Of course, that they won does not come as a surprise. Microbial-based solutions for agriculture are among some of the new innovations making waves in the sector in the developed world. The market for these products is valued at [\\$2.3 billion globally](#)). Biome Makers [raised \\$2.2 million in seed funding](#) in 2016 alone.

Microbes are tiny microscopic organisms such as bacteria and fungi that interact [with soils](#) and plants. Microbial-based solutions, which are formulated from microbes, offer multiple benefits to crops. These include improved growth as well as protection from insects, drought, and other climate-related extremities. The solutions also offer environmentally sustainable approaches to improved crops and productivity while ensuring the resilience of agricultural systems. [Poncho®/VOTiVO®](#) is an example of a microbe-based solution product developed by Bayer Crop Sciences. When applied to corn plants as a seed treatment, [it improves](#) their growth, protects them from pests and ultimately increases yields by 15%.

Unfortunately, the appreciation of microbes and the potential microbial-based solutions have for improving agriculture in Africa is in its infancy. It hasn't yet enjoyed the same traction as in developed countries.

It is easy to understand why this industry has been slow to jump start in Africa. [The startup costs](#) associated with setting up cutting-edge laboratories that are equipped to do soil microbial research are high. They range from \$300,000 to \$1,000,000. This means we're yet to see research institutions or private industries based in Africa taking the lead in spearheading this research.

African initiatives

Despite the hurdles, a few initiatives are starting to roll out across Africa.

The University of Pretoria's Centre for Microbial Ecology and Genomics and nine other African countries recently launched an initiative that aims to [discover the microbial diversity in African soils](#). Data obtained from this initiative would help document and uncover the types of microbes present in African soils. New microbe species with unique traits to influence crop, soil, and plant growth could also be used to formulate products that help improve crop productivity.

Ag Biome, based in North Carolina, was awarded a [multi-year grant](#) by Bill and Melinda Gates to create microbial-based products for the control of weevils which can cause 60-100% losses in sweet potato in Africa.

The Innes Centre, based in the UK, is working on research [to discover if microbes can be tapped to help cereals access nitrogen](#). This would help improve yields for smallholder farmers in Africa.

Room for more

But there is room to do more. The question is how to inspire African countries to jump on the agricultural-microbial-based-solutions bandwagon and revolutionise agriculture in Africa.

Perhaps the first natural thing would be to launch microbial-based solutions within Africa's existing research institutions that are already focused on agriculture. It makes sense to work with institutions that have previously managed successful soil initiatives.

The Alliance for a Green Revolution in Africa (AGRA), for example, successfully implemented a [soil health programme](#). It [helped improve agricultural production](#) in several African countries. Adding an additional component to this soil health programme would be a natural fit. [AGRA](#) draws some of its funding from the Bill and Melinda Gates Foundation, which has already shown interest in the field as evidenced by its funding for AgBiome.

Venture funders also need to expand their portfolios to accommodate startup companies that fit this niche. The startup culture is not new in Africa. Kenya, for instance, is known as [Africa's Silicon Valley](#). It has been the hub for funding more than 3,500 tech-related startups and over \$1billion in venture capital being made available to accelerate these startups.

Alternatively, venture funders can bankroll pre-existing startups. There are several to choose from, like [Soil Doctor](#): a company that's already up and running in [Kenya](#), [Uganda](#) and [Nigeria](#). It tests microbial diversity in soils and uses the information to advise farmers.

The future

All the evidence suggests that microbial-based innovations will continue to play a role in improving agriculture in years to come.

Just recently, the [BioAg Alliance](#) announced that it will introduce two new products in 2017 developed from soil microbes, Acceleron B-300 SAT and Acceleron B-200. These increase the nutrient uptake of corn and soy plants.

It will take every resource and innovation available to ensure that Africa can feed its rapidly expanding population and eradicate hunger. The continent must harness everything it can with the potential to impact and revolutionise agriculture. Innovations spinning off from microbes derived from soil have proven that they can do this.

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