

***Report for workshop on PLANT BIOLOGICALS FOR AFRICAN AGRICULTURE, Pretoria
10-11 October 2019***



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Introduction

As part of AgriFoSe's proof of concepts Tewodros Mulugeta (Kotebe Metropolitan University) and Erik Alexandersson (Swedish University of Agricultural Sciences, SLU) received means to conduct a Workshop on Plant Biologicals for African Agriculture with a number of selected international participants. The workshop was held on 10-11 October 2019 in Pretoria, South Africa. The Agricultural Research Council (ARC) represented by Lerato Matsaunyane and the South Africa Biocontrol Organisation (SABO) represented by Wilma Mac Pherson hosted the workshop.

The concept of the workshop was worked out together with Stockholm Environmental Institute (SEI), SABO and ARC, which also helped with promotion. A preliminary program was drafted in June 2019 and selected representatives from African universities, institutes, organizations, policymakers and farmers were contacted in July. The goal was to invite around 25 participants.

Attendees were from Africa working on biologicals for agriculture in different national and international organizations and universities as well as from SLU. Company, farmer and governmental representatives from South Africa also participated. In total, there were 32 participants. A full list of attendees is presented in Appendix A.

Biologicals are products based on organic matter, which can serve as biostimulants, biocontrol agents, resistance inducers or biofertilizers. They can be derived from terrestrial and aquatic microorganisms, plant extracts or other naturally occurring organic matter. Biologicals should lead to improved plant protection, growth enhancement and/or soil improvement. Biologicals, which form an alternative to conventional pesticides, are little studied and used in Africa in comparison to North America and Europe.

Pre-meeting survey

Before the meeting 26 representatives received an online survey around biologicals and already existing related networks/associations. This helped to set the agenda for the meeting. The answers to this survey is summarised in Appendix B. Some features are highlighted here as word



Figure 3: Word cloud based on survey answers on who would benefit from improved use of biologicals in African agriculture

From the pre-meeting survey it became clear that many of the participants associated themselves as working with biologicals as well as with biopesticides and botanicals which are similar, and the terms biologicals and biopesticides can even be used interchangeable, whereas botanicals (any plant derived material used in disease control) is a more narrow example of a biological.

Among the main challenges identified was the need for more research, easier paths for registration and more appropriate regulation for biologicals (Figure 2). The group clearly thought that farmers but also private companies and new markets would be the main beneficiaries of a strengthened focus on biologicals in Africa (Figure 3).

Outcomes of the workshop held on 10-11 October 2019 and summaries of presentations

The full and final program of the workshop is presented in Appendix C.

The **first day** we listened to representatives of academia, government and industry. They gave valuable insights into the challenges and possibilities of adapting biologicals from academics, policymakers, smallholder users and company perspectives. Summaries of all presentations are found in Appendix D.

As an introduction, Prof Mark Laing (UKZN) talked about “Constraints to the widespread use of biological control agents in Africa”, Ivan Rwomushana (CABI) on “East African Community initiative on harmonization of biopesticide regulations for the region”, Thembisa Majola (DAFF) on “Regulatory framework and thinking in South Africa”, Shandu Netshifhefhe (GDARD) on “Challenges for small-holder farmers” and finally Francois van Greunen (Laeveld) gave “A business perspective on plant biologicals”. For inspiration Lerato Matsaunyane and Flip Steyn also gave examples from ARC on how they work on biologicals and Erik Andreasson on the recently started Plant Biologicals Network for Southern Scandinavia.

Challenges and opportunities of biologicals were discussed in the afternoon of Day 1 in five groups. The groups were asked to first list challenges and opportunities of using biologicals for African agriculture. This was collected and categorized (Appendix E). These were presented to the whole group and then a prioritization was made based on their importance in the same groups. The figures below show the joint outcome of the prioritized challenges and opportunities of using biologicals in African agriculture.

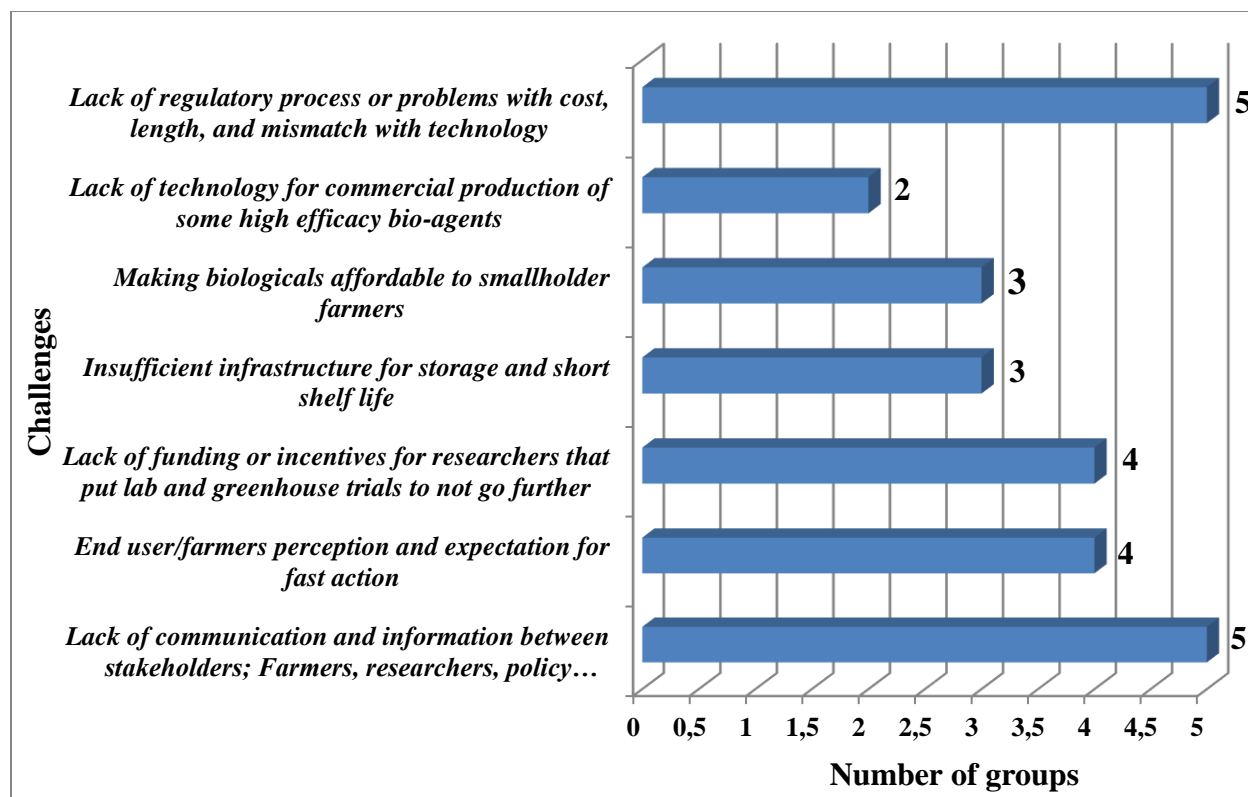


Figure 4 The most important challenges in using biologicals in Africa as ranked by five discussion groups.

From Figure 4 it is clear that the regulatory process for biologicals should be well defined and clearly stated, and that there is a general lack of communication around biologicals. These issues have been identified before and are known¹. Furthermore there is a lack of funding to test findings in the lab out on the fields (more applied research is needed). Finally, challenges associated to small-scale farmers around affordability and storage as well as shelf-life of biologicals were identified as priorities.

These challenges differed a bit in comparison to the ones highlighted in the pre-meeting survey where there was more focus on research and lack of structure and means to do that to advance biologicals for African agriculture.

¹ Mulugeta, T., Muhinyuza, J.B., Gouws-Meyer, R., Matsaunyane, L., Andreasson, E. and Alexandersson, E., 2019. Botanicals and plant strengtheners for potato and tomato cultivation in Africa.

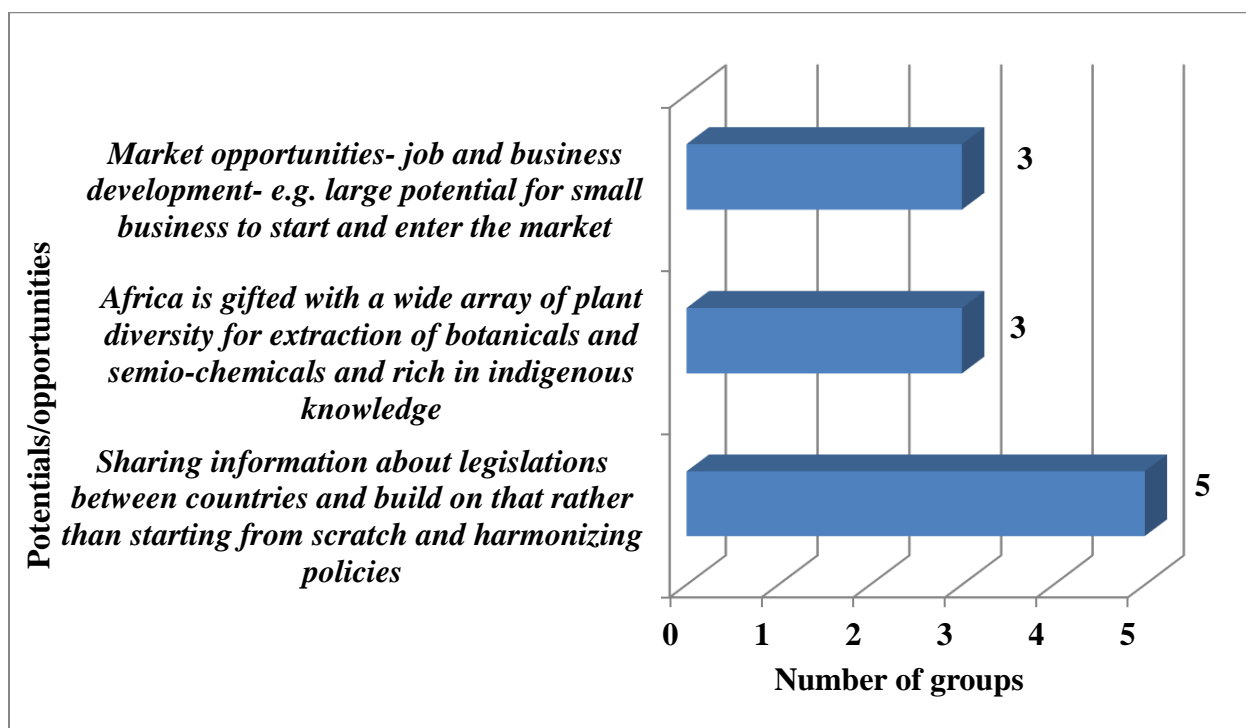


Figure 5 The most important potential/opportunities of using biologicals in Africa as ranked by five discussion groups.

During the **second day** the participants were shown the seven expected outcomes of the meeting and asked whether these had been met.

Expected outcomes stated before the workshop

1. To understand participants' views regarding the need of establishing a plant biologicals network for Africa. Participants include researchers, funding agencies, private companies, government organizations, and farmers.
2. If a need for a plant biologicals network Africa is expressed, we expect to identify the next possible steps for such an establishment
3. Possible actions for securing funding to help establish such a network should be identified.
4. We hope that participants will find new collaboration networks in the meeting for further work in the area.
5. The workshop would spark participants interest in the area and facilitate more work on the area.

6. To reach policymakers about plant biologicals.
7. The importance and potential of plant biologicals will be introduced to users including private companies and end users such as smallholder farmers.

These outcomes were generally achieved according to the participants. In addition the following two outcomes were achieved according to the participants:

1. Contact point established with documentation on Google drive.
2. Potential founding members of network gathered.

During the second day we also heard FAO's perspective on biologicals through an example presented on the outbreak of fall army-worm by Sina Luchen. From Garikai Marava (NWDARD) and Motlapele Morule (Bakwild) provided insight into the perspective of smallholders and how to reach them with biologicals. Summaries are presented in Appendix D.

At the end of the second day of the workshop an open discussion was held around the possible need of a network for biologicals in Africa, its format and aims, and how it could be constituted. The possibility of starting a network to increase the awareness of the use of biologicals for African agriculture was previously suggested by Mulugeta et al (2019)¹.

There was generally an agreement that a network should be helpful to connect researchers, policymakers, private enterprises and farmers (end-users). Whether it should be a loosely based network or an association with membership fees as well as whether it should start in smaller regions or on Pan-African basis were things that were discussed.

The name for such a network and definition of biologicals were debated. The group agreed on that plant should be removed from plant biologicals to rather be just biologicals for agriculture, which in this context should be defined in its broadest form to also include horticulture, forestry and livestock. In the definition, sustainability should be included and the group consequently agreed on the following short description:

“Plant biologicals are naturally derived products that can serve as biostimulants, biocontrol agents, resistance inducers or biofertilizers. They can be living organisms or derived from naturally

occurring organisms, plant extracts or other organic matter. Their implementation should be safe and support a sustainable transformation of agriculture.”

The comments, suggestions, and concerns shown below in bullet points were given in the discussion

- The benefit of adapting biologicals in many African countries is in a sense higher since synthetic pesticides which are currently banned in developed countries are still in use in developing countries and are still causing serious problems. Therefore, it is important to capitalize on the available resources such as the biological control agents which could often be a safer option in a number of perspectives.
- A network for biologicals can be used to share knowledge between African countries around research and policy.
- In fact, many researchers in different parts Africa are already researching biologicals, but they are unaware of each other’s activities, and a network can connect these ongoing research projects and increase their impact.
- The network should take companies and other stakeholders onboard in order to take a holistic approach spanning from research to needs of end-users (farmers).
- There are companies that produce biologicals but they are few in number and not well organized seen over the whole of the African continent. Thus the network should work to assist them and help them reach both policymakers and farmers.
- The network should highlight the possibilities of biologicals and also help to remove unnecessary obstacles for their introduction by involving policymakers and government entities and have an active dialogue with these.
- The platform can be used to better engage companies and farmers in researchers.
- More work is still needed to have clear definition of biologicals and especially to explore and clearly state aims for the network.
- A draft a document to establish the network is needed; the one SABO has in place can be used as a draft and inspiration can also be taken from PBN Southern Scandinavia.

- The important question is who will be driving the network and take the lead? CABI representative Ivan Rwomushana stepped forward and will raise the possibility within CABI for them to host a possible constituting meeting as a follow up to this workshop.

The following points were raised during the discussion on how to get funding for the network

- Both international and country based funding agencies should be approached to secure funding. A number of Swedish and South African grant givers were suggested.
- USAID often provide support for workshops so we can apply to get funding for the next workshop to continue and work on the establishment.
- Companies working in biologicals can be approached to seek collaborations.

And action... The way forward!

As conclusion to the meeting the way forward was discussed. Most of these actions need additional funding and would be core activities of a future network/association of biologicals for African agriculture:

- Collection of resources for plant biologicals Africa by mapping:
 - Published papers
 - Competence mapping
 - Available infrastructures
 - Ongoing projects
- Find successful and unsuccessful examples where biologicals gone from lab to market in Africa
- Mapping and communicating existing related networks and possible stakeholders
- Model on existing national networks
- Create joint information material
- Launch project on affordable biologicals
- Highlight “endemic” African biologicals

Ivan Rwomushana (CABI) will, with the help of Erik Alexandersson (SLU), raise the possibility for CABI to host the next meeting, possibly in Nairobi. In addition Wilma Mac Pherson (SABO) and Mark Laing (UKZN) as well as Erik Andreasson (SLU) will provide more information on the statues and structures of SABO and PBN Southern Scandinavia in order to aid the formation of a Biologicals Network for Africa.

Publicity

It is worth mentioning that the workshop was highlighted in national South African radio station Metro FM and 702. We thank Morile Motlapale (Bakwild) for representing the workshop and highlighting our work in these interviews. We also tweeted throughout the workshop using #AgriFoSeBiologicals

Acknowledgements

The organisers thank all the participants for taking their time to attend the workshop and for their constructive contributions. In addition we thank Laura Grenville-Briggs and Teun Dekker for assisting in taking meeting notes. We thank Quenton Kritzinger (UP) for proof-reading the report. A special thanks goes out to Lerato Matsaunyane and her team for arranging the venue and helping to contact South African participants.