Create a long-term R&D collaboration to domesticate Allanblackia and make it available for agroforestry systems in Africa

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Background

- Allanblackia seeds contain oil with unique properties for high quality margarine production
- Smallholder farmers can integrate Allanblackia in their cocoa plantations to increase and diversify their income with agroforestry
- Food companies can benefit by enriching their products with Allanblackia
- Large-scale planting of Allanblackia results in CO_2 sequestration by the growing trees, while producing oil (without using land)

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Background

- However, transitioning from wild harvest to cultivation has been difficult:
  - Lack of good planting material
  - 7-12 years before trees start fruiting
  - Half of the trees are non-fruiting males
  - Undeveloped agronomic practices
  - Unclear market

Goals

To design a multi-year research program to solve the key challenges in Allanblackia seed production and create incentives for farmers to plant and cultivate Allanblackia:

- Plant breeding-related goals
  - A method to tell males from female plants in the seedling stage
  - A breeding program to shorten the juvenile stage
- Agronomy-related goals, designing ways to integrate Allanblackia into existing cocoa plantations
- Explore ways to optimize the supply chain and create incentives for smallholder farmers to invest in planting Allanblackia trees

Partners

- WUR (Plant Breeding, Plant Production Systems, Biosystematics
- Form International and
- Form Ghana (local entity, manages common garden trials)
- GloblGroup (production chain management)
- Upfield BV (margarine production)
- Rabobank (CO2 fixation)

Planned activities

- Meet with partners and colleagues in WUR
- Desk research
- Visit to Ghana (delayed, cancelled)
- Develop R&D program
- Build consortium and explore funding opportunities
    - TKI (pre)proposal on breeding
    - SDGP proposal on agronomy and supply chains

TKI preproposal: Rapid domestication & sex determination of Allanblackia to boost supply for the vegetable oil industry (LWV21.178)

- The project builds on common garden trials of Allanblackia trees of Form (and FORIG)
- Assemble the genome of one female and one male tree
- Genotype 200 female and 200 male trees in the common garden trials to identify the genomic region(s) responsible for sex determination
- Develop a simple PCR test which can be applied locally to seedlings in nurseries.

TKI proposal (not submitted)

- Analyse genetics of traits in the set of 400 genotyped trees including juvenile period
- Test ways to speed up breeding: grafting on mature rootstocks, genomic selection, speed breeding

➢ Main industry partner was Upfield. They decided in the summer not to participate/invest

➢ The TKI proposal was not submitted

➢ We are now in discussion with other companies

SDGP proposal (to be submitted)

- Produce trees in central location(s) in Ghana (nucleus farm)
  - local legal entity
  - with ambitions for breeding and continuously improved seedling/sapling production
- Collaborate with a large cocoa producer that has set up a similar system to produce material in an outgrower system to support farmers in the region
- Make Allanblackia one of the tree species in the mixed package offered to farmers for good agricultural practice (shading)
- Gradually increase quality and where necessary upgrade trees in farms (grafting)

SDGP proposal

- CO2 fixation compensation could be managed by this firm for the farmers.

➢ We intend to submit the proposal when the call opens (expected first half of 2022)

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Improvements of the business case

- Local breeding entity in Ghana foreseen that will produce trees, with the aim to improve the quality through breeding and other improvements of practices
- Close collaboration with FORIG; they can run the PCR markers
- Associate closely with cacao tree production and farmers' advise system and let Allanblackia be one of the trees
- Combine wild harvested and plantation Allanblackia oil for the coming years
- One large European margarine producer to be replaced by a couple as customers that can scale to the size of oil production

Questions?

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