



Small-scale Residue Utilisation Pathways (SSRUP) - Essential oils

Description

The type of mobile integrated biorefineries developed in DIVAGRI are Small-Scale Residue Utilisation Pathways (SSRUP) for High-Value Products. They can produce a range of high-value products such as biofuels, biopesticides, fertilizers, animal feeds, mushrooms and non-synthetic fertiliser. Essential oils, derived from various plant parts, have gained attention for their medicinal properties and as biopesticides due to their eco-friendly nature.

Benefits

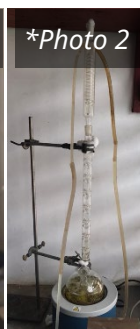
- Moringa and Neem oil is used to boost body immunity, protect and nourish skin and hair as well as assist with diabetes and high blood pressure.
- Other essential oils are used as bioherbicides to combat unwanted weeds or bioinsecticides to repel or harm pests.

Challenges

- Laboratory equipment and a good knowledge of the scientific process of distilling is needed.

Country Example: University of Cape Coast, Ghana

1. Dried Neem and Moringa seeds /leaves are blended and then weighed and poured into the round bottom flask. A total of 250ml of hexane is measured and added. (*Photo 1)
2. The reflux condenser is connected to the connecting pipe, which is also connected to the round bottom flask. The connecting pipes are also connected to the cooling chamber. (*Photo 2)
3. The flask is placed in the heating mantle. The reflux condenser is connected by inlet and outlet tubes to the cooling chamber. The solution is boiled and the essential oils vapourised into the condenser.
4. At the reflux condenser, the cooling jacket converts the essential oils in their vapour form back into the liquid state where they fall back into the boiling flask.
5. The next stage is to use the vacuum pump to filter out the hexane plus the neem oil/moringa oil solution from the residue. (*Photo 3)
6. The rotary evaporator is then used to separate the hexane from the oil. (*Photo 4)



Knowledge Sharing Centres

Below are the contact persons for country specific questions. Please refer to them or the Coordinator from Hochschule Wismar, for details about the technologies that have been piloted or project research, training, and dissemination activities that are being planned in your region or country. The project runs until May 2025, with Knowledge Sharing Centres established to continue the work beyond that date. More details available on the website <https://www.divagri.org>

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This fact sheet serves as a general overview of the above bio-based technology (BBT). It is one of seven BBT factsheets. It describes one prototype of this technology that was developed prior to 2023. Adaptations of it have been made for the various country and local contexts. Please contact the country Knowledge Sharing Centre for more details. The EU-funded DIVAGRI project (2021-2025), 'Revenue diversification pathways in Africa through bio-based and circular agricultural innovations' seeks to provide African subsistence and smallholder farmers with tools to sustainably improve farm productivity, profitability and resilience through improved management of farming resources, output diversification and creation of high-value circular bioproducts. For more, visit [divagri.org](https://www.divagri.org)



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101000348.