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Agri-mats as a tool for soil mulching

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ARC-NRE-Agricultural Engineering Campus

The ARC-NRE Agricultural Engineering Campus is piloting the uptake of Agri-mats for mulching soils in smallholder farming systems of Sekhukhune District, Limpopo. The project has started with rainfed systems during the 2023/24 rainfall season and will be implemented in irrigated systems during the dry season.

Agri-mats are bio-boards made from organic materials. The main input in our Agri-mats is bagasse from sugarcane processing. The other

biomaterial used in manufacturing the Agri-mats, at the ARC-NRE Agricultural Engineering campus, is cow dung. These are mixed with water and Magnesium Oxide. The mixture is hot-pressed to produce the boards.

Once brought to the ARC-NRE Agricultural Engineering campus, the bagasse is sieved to remove the fine material. Meanwhile, the manure is crushed into small particles. The bagasse and cow dung are then mixed with a binding agent – Magnesium Oxide (MgO) –



Agri-mats placed in the crop field with sorghum



Collecting bagasse in KwaZulu Natal



Sieving bagasse



Loading the form into the heat compressor

and water in the ratio 320g bagasse: 110g cow dung: 84g MgO: 500g water. Accurate weighing and thorough mixing of the ingredients are very important for the desired quality and weight. Mixing is done using an electric-motor-driven mixer. The mixture is loaded into a form and then into a heat compressor with the temperature set at 152°C. After 10 minutes of heat compression, an Agri-mat of size 0.5m × 0.3m × 0.03m and weight 430g is retrieved. Once dried, the Agri-mats are stacked on wooden pallets in a warehouse to allow natural drying before they are transported to beneficiary locations. So far, a total of 1230 Agri-mats have been delivered and installed on croplands in Sekhukhune District.

Piloting the use of Agri-mats as a tool for mulching soils in smallholder farming systems will be run over a 3-year period, 2023-2026. The performance of the Agri-mats will be evaluated during that period to appropriately inform plans on the way forward.

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