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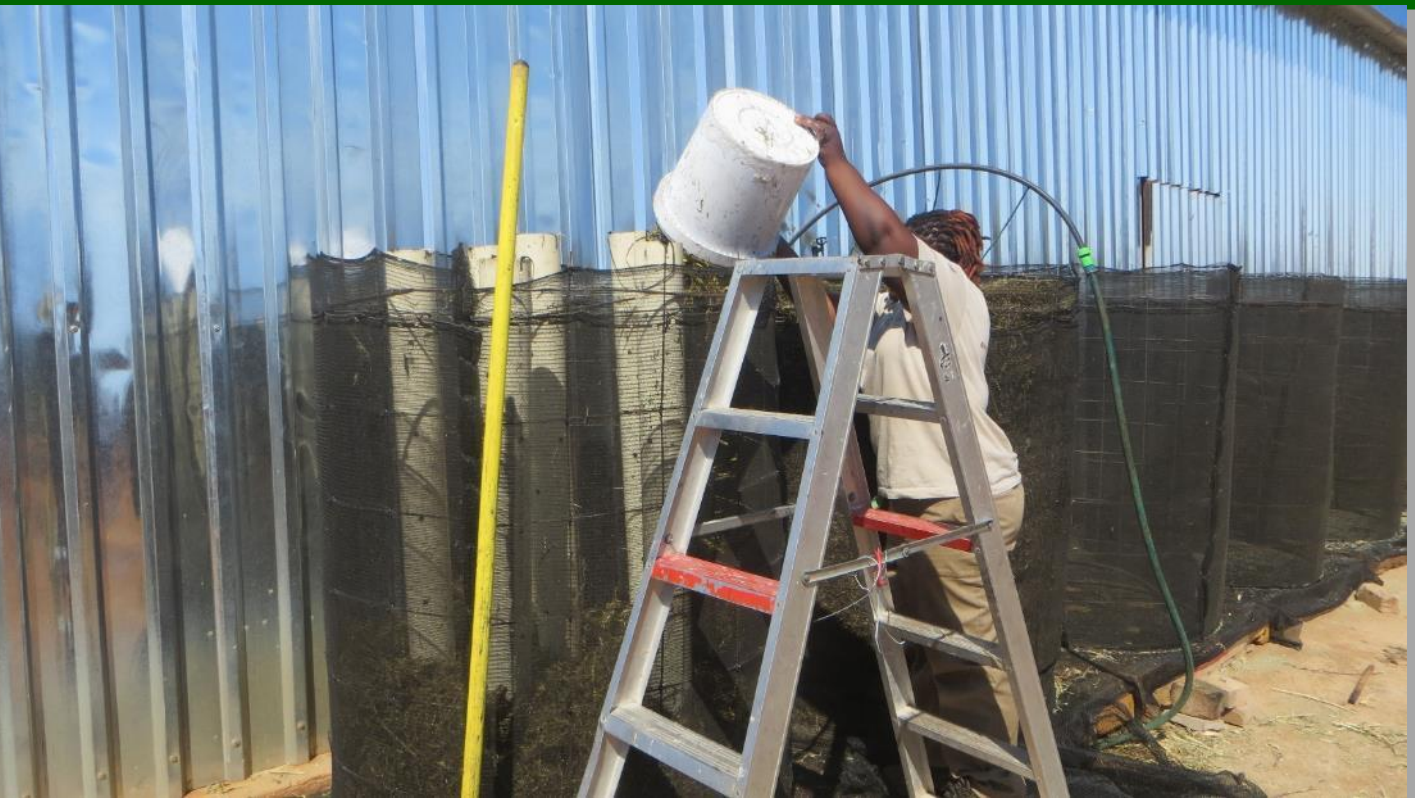
BUSH
BIOMASS UTILISATION BY SUSTAINABLE HARVEST

POTENTIAL OF HIGH QUALITY COMPOST DERIVED FROM ENCROACHED BUSHES



Ibo Zimmermann (NUST) & Beckser Shipingana (CCF)

Cheetah CONSERVATION FUND

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BUSH BIOMASS UTILISATION BY SUSTAINABLE HARVEST

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Poor quality composts

- Most commercial composts are of poor quality
- Expected to be applied at high rates
- To provide mainly carbon and little fertility
- Low or no humus
- Bacteria dominate the microbes
- They tend to favour the growth of weeds

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High quality composts

- High quality compost needs time to mature
- Can be applied at very low rates
- To provide mainly spores of diverse fungi
- That form associations with crop roots
- That in turn feed soil microbes with root exudates
- To build up soil carbon by growth

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Potential feedstock for production of high quality compost

At CCF

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Small branches with leaves, such as those selected for milling into fodder, are also appropriate for conversion into high quality compost

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Conversion of thicker branches into biochar in Kon-Tiki kiln

At CCF

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Some of the thicker branches from harvested bushes can be converted into biochar for incorporation into the feedstock for compost

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Small branches are shred into green chop at CCF

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BUSH BIOMASS UTILISATION BY SUSTAINABLE HARVEST

The resulting “green chop” is blown into the trailer

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BUSH BIOMASS UTILISATION BY SUSTAINABLE HARVEST

Green-chop is later offloaded from the trailer

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BUSH BIOMASS UTILISATION BY SUSTAINABLE HARVEST

First attempt at milling of green chop resulted in excess scattering

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This was solved by placing a netted hood over the mill

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Later in season when bushes were more moist, the shredding produced green chop fine enough for use without milling

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Green chop is transferred to Kon-Tiki kiln …

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… for wetting in the kiln

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BUSH BIOMASS UTILISATION BY SUSTAINABLE HARVEST

Coarse pieces of green chop are removed by hand

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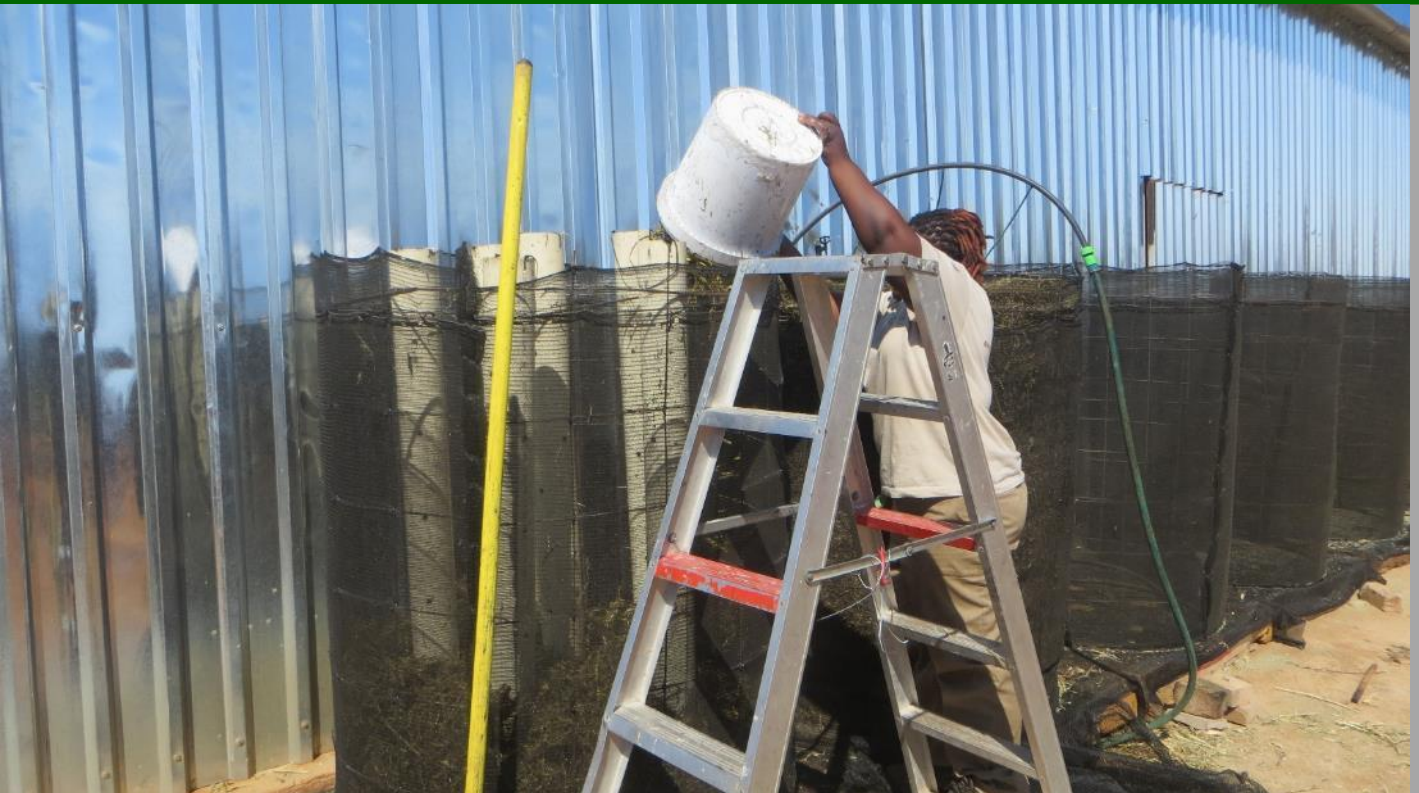
BUSH BIOMASS UTILISATION BY SUSTAINABLE HARVEST

Wet green chop is poured into Johnson-Su Bioreactor at CCF



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BUSH BIOMASS UTILISATION BY SUSTAINABLE HARVEST

Crushed biochar is scattered over every 2 buckets of chop

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Pitch fork is used to level and compress chop in bioreactor

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BUSH BIOMASS UTILISATION BY SUSTAINABLE HARVEST

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Ventilation pipes are removed the following day

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Sprinklers and drip for daily irrigation of 6-8 litres

When the moist feedstock has cooled down after the first few days, some earthworms are introduced from above, which multiply rapidly as they move down

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Fungi growing out of top

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Dense fungi

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Testing various rates of biochar applied in reactor feedstock at CCF

The amounts of crushed biochar added to each of the eight reactors are 0, 1, 2, 3, 5, 10, 15 and 20% of the volume, to hopefully determine the optimum. Will be ready for testing in Jan 2020

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Fungi growing out of sides

About 300 kg of compost is expected to be harvested per reactor after 12 months. No turning, which would disrupt fungi

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Bioreactor at Okukuna farm

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Bioreactor at NUST