Making biochar in soil pit kilns

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Soil pit kilns are the most ancient technique of making biochar

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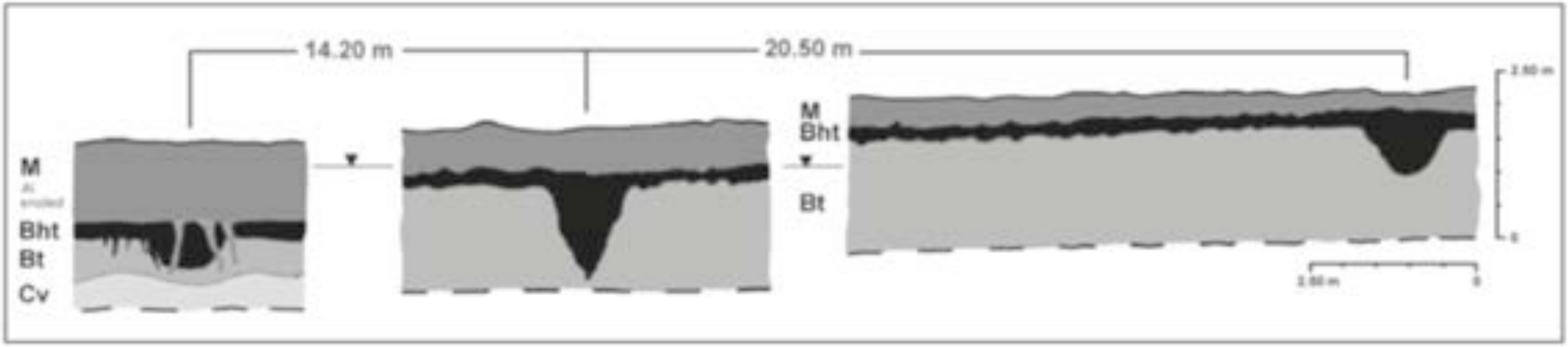
they are still to be found as terra preta pits in many places in the world



Typical profile section of a soil west of Cologne. Among the superficial unconsolidated sediments is a black soil horizon containing deep black soil pits up to 2 m deep with high proportions of charcoal. (from: Gerlach et al 2012)

dig the pit with a diameter of 2 meters and a depth of 1 meter

The sidewall should be shallow enough to walk in

The diameter to depth ratio should be arround 2 : 1

Put stones arround for wind protection and updraft of combustion air

Put some dry feedstock in the middle of the pit and lit the fire at the top

Enkindle the fire from the top

Light the pyramid pile from the top

creating the up-draft

let the fire burning to about 1/3 from the top of the stack or pyramid creating a strong up-draft which pulls in air at the side walls of the pit. Spread then the feedstock at the bottom.

Making blaze for the first charing layer

When enough air reaches the bottom of the pit to make it catch fire, level the burning feedstocl wood to create the blaze for the first charing layer.

Add then layer by layer new feedstock

Time to put the next layer

When ashes appear on the wood, put a next layer of wood.
The charring continues beneath the fire front.

Time to put the next layer

When ashes start to appear on the feedstock, put the next layer of feedstock. The charring continues beneath the fire front.

charing temperature 650° to 700°C

The temperature at the surface of the blaze is around 620° to 660° C depending on the humidity of the feedstock.

time to quench

Stop the kiln either by water or …

Quench the kiln with water partially activates the biochar (cleaning of the biochar pore structure and increasing surfaces)

or charge it hot with cow urine to make biochar-fertilizer

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or quench it
with soil and
wait 24 hours

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Easy to make 500 l of biochar in 2 hours

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Metal-soil kiln Kon-Tiki

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preparing the final place for the kiln

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ready to be fired for the first biochar in Dhading

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bringing down the feedstock to be chared: Eupatorium (forest killer) the most appropirate and usefull feedstock for making biochar in Nepal

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The dry feedstock reduced the ignition time to 7 minutes

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Biochar field and farmer trial in pumpkin plantation Nalang, Baireni village, Dhading, Nepal, 1/2015

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Eupatorium is a most excellent feedstock for making biochar

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an hour later the biochar for the 10 field trials with pumkins was made

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digging of plant holes

carrying the compost to the field

preparation of urine-biochar substrates

applying of the compost

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applying of biochar-urine slurry

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mixing of compost and biochar-slurry

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pro Kon-Tiki for 1.5 t biochar in 8 hours

www.ithaka-institut.org

www.biochar-journal.org

Hans-Peter Schmidt,
ithaka institute for carbon intelligence, Switzerland

Asian Development Bank

Landell Mills
DEVELOPMENT CONSULTANTS

Paul Taylor
Bishnu Hari Pandit,
Ananta Ghimire,
Naba Raj Pandit
Simon Shackley
Gerard Cornelissen