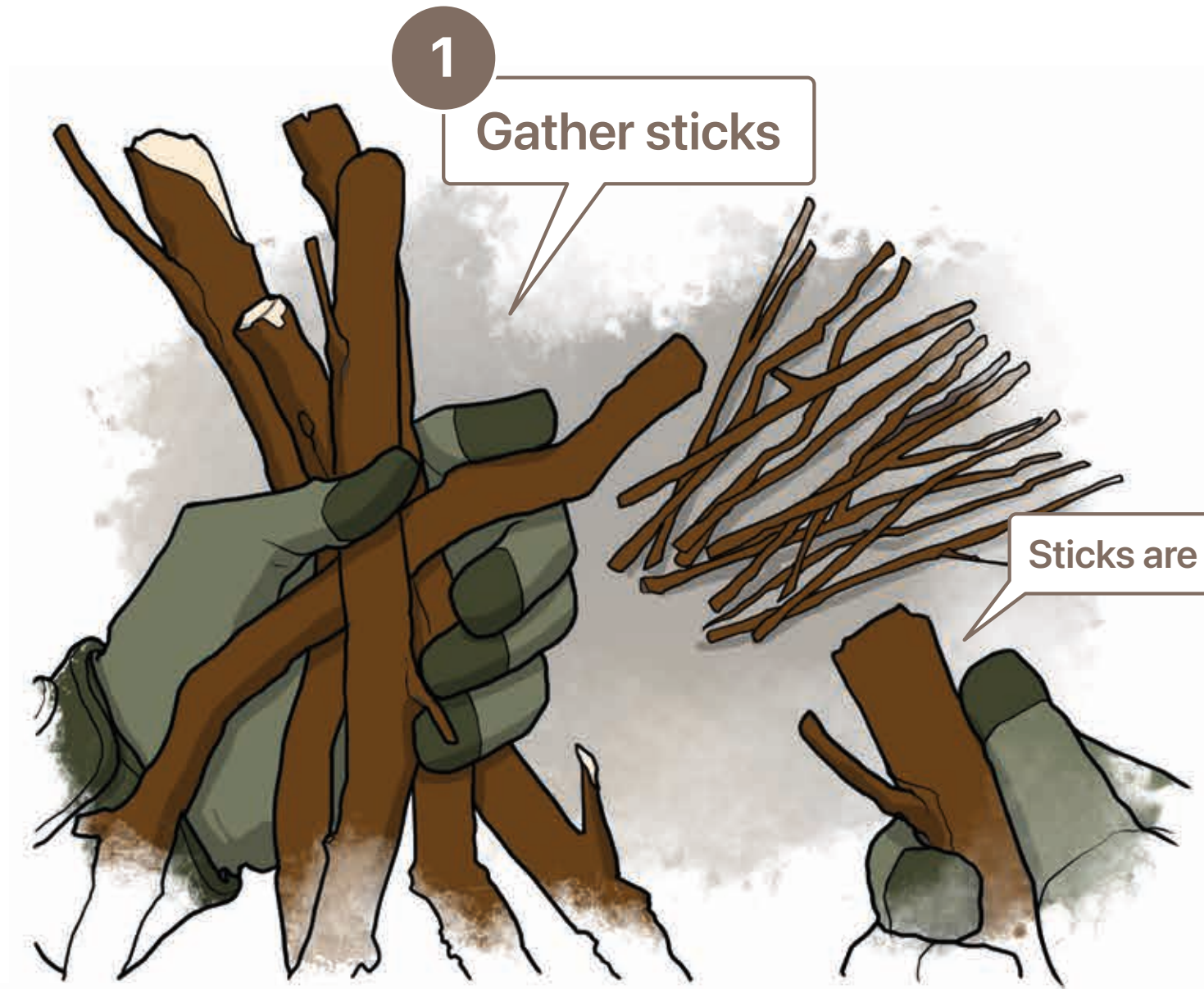


Preparations for making biochar

1

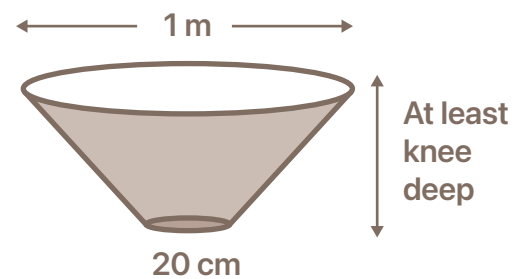
Gather sticks

Sticks are thumb thick



2

Dig cone shaped hole



3

Place some sticks in hole and light small fire



Preparations for making biochar

Additional information to share

Biochar is different from ordinary charcoal used for cooking fires.

Only thin branches and sticks are used – not the thick wood needed for charcoal.

The wood is burnt in a pit in such a way that very little oxygen reaches the fire. This prevents the wood from burning to ashes.

Always make sure that the area where you are making biochar is cleared to prevent wildfires.

Collect a big heap of sticks the thickness of your thumb.

Prepare enough of all the ingredients and place them close to the hole so you can reach everything easily and quickly – wood, water or sand, buckets, a spade or metal pole.

Try to wear closed shoes and clothes that are made from cotton to protect you from skin burns that can come from flying sparks. Long sleeves and trousers can protect you better from the heat of the fire than short sleeves, trousers and skirts.

Start with a small fire made with twigs and grass at the bottom of the pit.

Do not walk away from the fire because you need to feed it regularly with the next layer of wood.

KEY MESSAGES

-  Biochar is produced from thin branches and sticks that should not be used for cooking or making charcoal
-  Controlling the air for burning prevents the wood from burning to ashes
-  One can use a cone-shaped hole in the ground to achieve this control of air flow and reduction of oxygen
-  Start with a small fire made with grass and twigs
-  Then add a thin even layer of sticks every time you see ash forming on the wood until the hole is filled



How to burn biochar

1

Wait for wood to show thin layer of ash



2

Add wood in thin even layers - one stick thick at a time



3

When the pit is full, quench fire with water or sand



How to burn biochar

Additional information to share

1. Start with a small fire made with twigs and grass.
2. Then add the first layer of wood, the thickness of one stick.
3. Adding more wood has to be done at the right time to make sure that the coal does not burn into ash.
4. Watch the wood to see when a thin layer of ash is forming on the wood.
5. Add wood in single layers and do not pile it over each other.
6. Always watch for the ash to form before adding another layer of wood.
7. When the pit is full and you see ash forming again, quench or kill the fire.
8. You can use water or if you do not have enough water, use sand. This takes away the air and prevents the wood burning to ash.
9. When using water quickly pour over enough water to completely kill all the flames and coals.
10. Water is beneficial, because it opens the pores for more air and space in the biochar and takes out all the oils that are still in the wood.
11. When using sand make sure that you quickly cover the whole area, using buckets. Cover the top of the wood with a layer of sand at least one hand thick. If you have some water you can pour it over the sand. You can use moist sand for this purpose.

KEY MESSAGES

-  Watch the fire to see when ash is forming on the wood
-  Then add wood in a single even layer
-  Repeat this until the hole is full
-  When the hole is full, use water or sand to quench or kill the fire quickly and completely



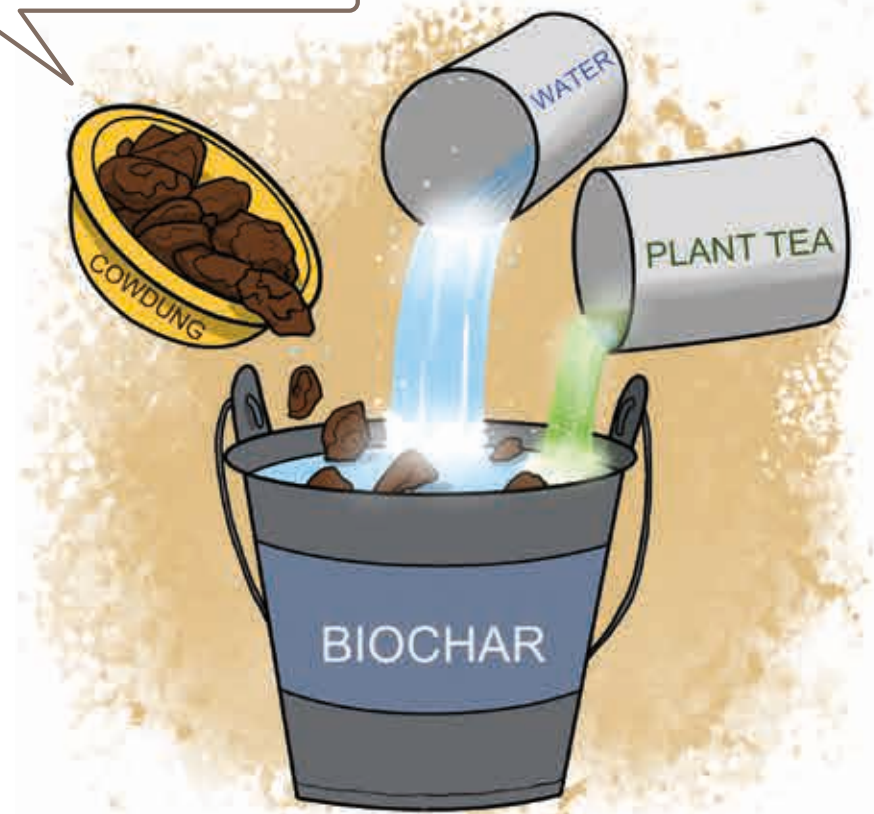
Charging biochar

A house for microbes,
nutrients and water



Add biochar to compost
to charge the biochar

Mix manure, water and plant
tea to quick charge biochar



Charging biochar

Additional information to share

1. Before the biochar is added to soil it must be "charged" i.e., filled with water, nutrients and microbes – life is added to the dead carbon, and it becomes alive.
2. If the biochar is directly added to soil after burning it, it sucks up nutrients and water from the soil and takes it away from plants that need these.
3. Biochar itself does not break down easily – it can stay in the soil for hundreds of years. It therefore only needs to be added once. However, one can add more over time as it becomes available.
4. Let the biochar and surrounding sand cool down before taking out the biochar.
5. Depending on how you will use it further, the pieces of biochar can be ground to smaller pieces by using a mortar and pestle or a pole and a bucket. It can be left as is to break up further when turned in compost or trampled by animals.
6. The easiest way to charge biochar is by adding it to a compost heap. A guideline for how much biochar to use is: Add up to 2 parts biochar for every 1 part of manure. This way it can take up nutrients, water and microorganisms. When one turns the compost, the bigger pieces of biochar break into smaller pieces – reducing the need to pound the biochar.
7. It is also possible to charge biochar by mixing it with fresh manure, urine, sour milk, plant tea or whey and some molasse to feed the microbes. If not all of these are available they can be left out. Daily turning adds oxygen and helps the microbes to multiply. After 5 days the biochar can be added to soil.

KEY MESSAGES

-  Biochar is like a sponge with lots of holes in it
-  Biochar does not decompose easily and stays in the ground for hundreds of years
-  If one wants to use the biochar to improve the soil, it first needs to be charged with nutrients, beneficial microbes and water. This is how it becomes part of the lifecycle
-  Do not simply add the biochar to the ground. Biochar absorbs nutrients and microbes from the soil that the plants need to grow
-  It can store water and nutrients for a very long time, preventing evaporation and draining of water and nutrients into deeper soil layers
-  Biochar can simply be added to compost to charge it



Biochar added to deep litter in livestock shelter

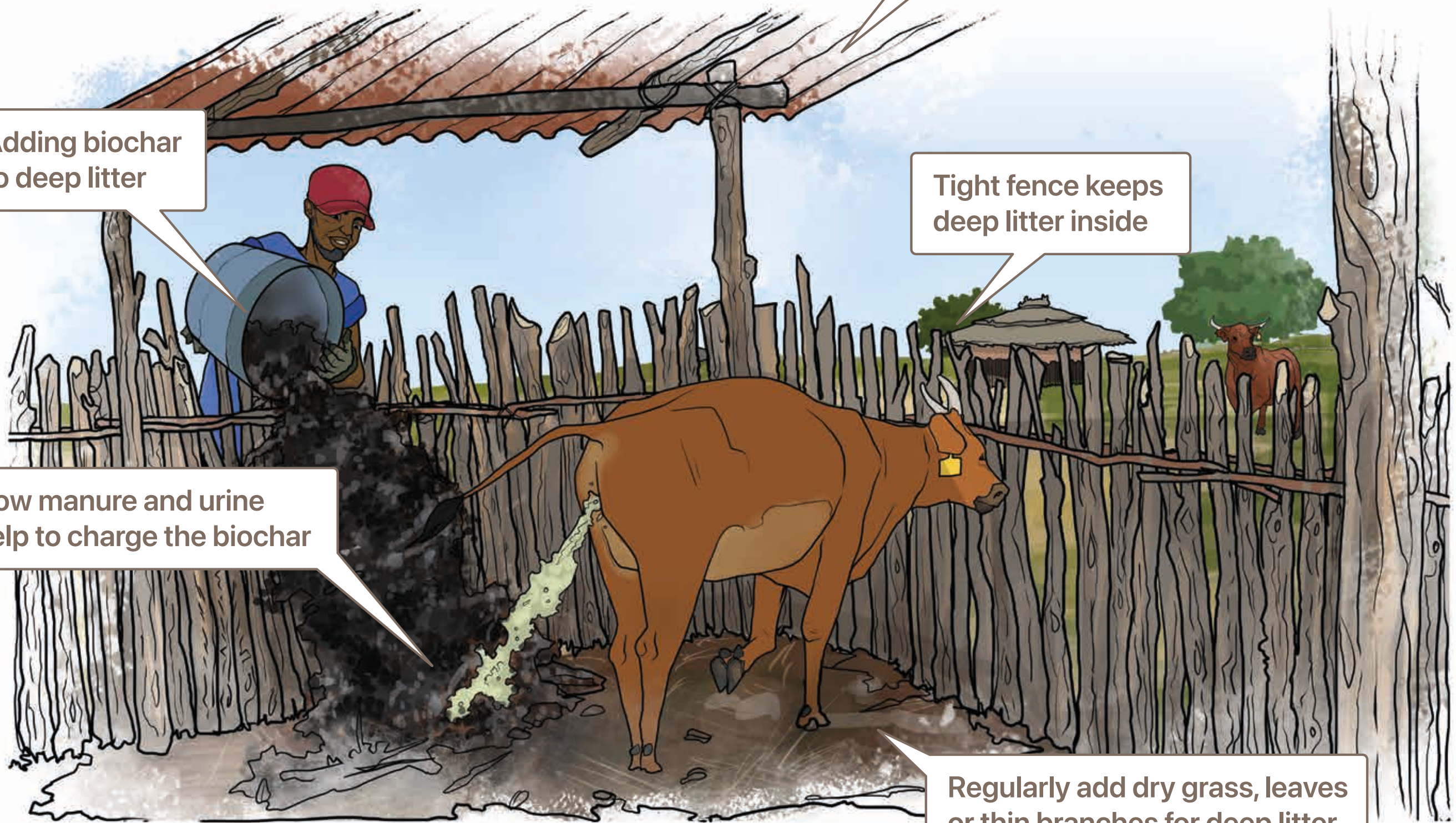
Roof protecting the deep litter from sun and rain

Adding biochar to deep litter

Tight fence keeps deep litter inside

Cow manure and urine help to charge the biochar

Regularly add dry grass, leaves or thin branches for deep litter



Biochar added to deep litter in livestock shelter

Additional information to share

Another way of charging biochar is to add it to the deep litter bedding of livestock shelters. Here it can soak up urine and the hooves of the animals can break up the bigger pieces.

When the layer of deep litter in the animal shelter is half a meter or more deep, it is taken out and piled with more plant materials and water into a heap for composting.

One can also use biochar to make a urinal for people. Place some biochar into a bucket with a lid and urinate into the bucket. Close the lid when not using it. Add more biochar as the bucket fills up. The biochar soaks up urine and there is less smell. When the bucket is full (or daily, as you prefer) empty the bucket onto your compost heap and cover with plant materials. This is an excellent and cheap source of nitrogen for your garden. Fresh urine is sterile and does not contain pathogens.

Seedling mix with 30 - 50% charged biochar helps to maintain moist conditions for emerging seeds.

Burning "waste" plant material or wood without making biochar from it is like throwing away money.

KEY MESSAGES

-  Adding biochar to the deep litter in a livestock shelter has many benefits:
 - It saves work to pound it, because the animal hooves break up the char
 - Nutrients and microbes from the dung and moisture from the urine are added at the same time, charging the biochar
 - Animals move the litter around, adding valuable oxygen
 - The char soaks up water, leaving the surface dry and clean for the animals
-  One can make a bucket urinal for people to add nitrogen to biochar
-  Especially sandy soils can become more drought resilient when they are amended with biochar

