Contour practices for soil & water conservation

What is soil and water conservation?

Soil and water conservation is the protecting and preserving of soil and water as two key resources for sustainable agricultural production. Conservation practices help to stop erosion, ensure that soil stays healthy and fertile, and to keep as much water as possible in the soil. Healthy soil has a strong structure that prevents erosion but allows water to sink into the soil easily and quickly.

Why are soil and water important?

Soil, particularly topsoil, holds all the nutrients and water that plants need to grow. Plants need water to make their own food and to move this food to different parts of the plants – from the roots to the stems, leaves or fruits. Water also leaves plants through their leaves (transpiration). This helps to keep plants cool in hot weather, stopping them from overheating and withering.

3 Principles of soil and water conservation

- Disturb the soil as little as possible to allow soil to keep its structure, provide a stable living space for micro-organisms and allow water to sink in.
- Cover the soil as much as possible to keep it cool, stop water loss and prevent erosion.
- Mix and rotate crops to keep soil healthy by preventing soil diseases. Different crops take different nutrients from the soil. Crop rotation helps the soil to regenerate and remain balanced.

The contour practices

When a field is on a slope or it is badly eroded, further action must be taken to conserve soil and water. One way to do this is digging trenches along the contour lines of the land. Contour lines are imaginary lines that link points of the same height above sea level. The trenches allows rainwater to sink into the soil and any soil that is washed away down the slope will enter the trench. This stops the runoff and loss of fertile soil. There are three steps to the contour practice:

- Building an A-frame
- Determining the contour line
- Making the contour design.

What you need

- 2 x 2-metre long poles
- 1 x 1.5-metre pole
- Wire/nails/rope
- 3 metres of string
- Wooden stakes or pegs (the number will depend on the size of land you are working with)
- Pen/marker/piece of charcoal (anything that can be used to draw/make a mark)
- An axe or panga
- A stone or heavy piece of wood
- Spade

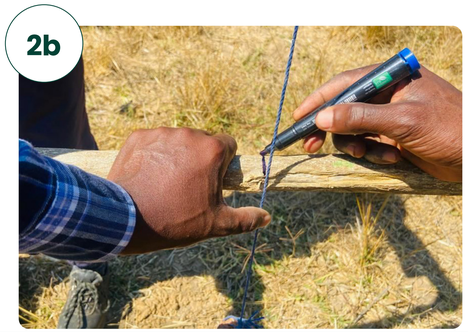
1

MAKE AN A-FRAME

Take the two 2-metre poles and nail or tie them together. Then nail the 1-metre pole to the other two poles, approximately halfway down making an 'A'. Tie the string around the stone and attach the other end of the string to the top of the 'A'.

2a

2b



2c

CALIBRATE THE A-FRAME

Place the A-frame on the ground and hammer a peg/stake into the ground at the point where each of the A-frame poles meet the ground – this is to mark the spots where the legs meet the ground.

Look at where the rope (that has the rock tied to it) crosses the centre pole (the crossbar). Make a mark on top of the crossbar where the rope touches it. Turn the A-frame around and place the two poles/ sticks back next to the pegs in the ground. Look at where the string crosses the crossbar, when it settles, and make another mark.

Now mark the point between the two marks made on the cross bar. This is the centre mark and when the string hangs over this middle mark, it means that the legs are on ground that is the same level – the contour line.

3

FIND THE CONTOUR LINE

Place the A-frame on the ground and move it around slightly until the rope hangs over the central mark on the cross bar. Then bang a stake or peg into the ground next to the front leg of the A-frame. This will be the start of the contour line.

4

MAP THE CONTOUR LINE

Leave front leg on ground; swing A-frame around so that the back leg comes in front. Move it till the string lines up with the middle mark on the crossbar. When it does, hammer a stick or peg into the ground next to the front leg. Move across the slope repeating this process. Do not lift the A-frame off the ground at any point. The pegs set out the contour line.

5

CHECK THE CONTOUR LINE

Keep marking the contour line to the end of the field. Look at the line of pegs. It should be relatively straight and not a zigzag pattern. If a peg is completely out of line, move it to make a straighter line. The size and steepness (slope) of the land will influence how many contour lines are required. The steeper the slope the more contour lines needed.

TYPES OF CONTOUR STRUCTURES

GRASS STRIP
Plant tuft-grasses like vetiver, Napier and guinea grass in strips across the slope to help hold the soil and slow down water that is running down the slope. Use the grass as fodder.

CONTOUR DITCH & RIDGE
Dig ditches along the contour line (30 centimetres deep by 50 centimeters wide). Use soil from ditch to make a ridge on downhill-facing side of ditch. Place plants with strong root systems in this soil to hold it in place.

STONE LINE
Pile stones along contour line, bigger stones on downhill side and smaller ones on uphill side. This will slow down water and let it sink into the soil. Grow crops between the stone lines.

KCOA Knowledge Centre for Organic Agriculture in Africa

KHSA Knowledge Hub for Organic Agriculture in Southern Africa

german cooperation DEUTSCHE ZUSAMMENARBEIT

Implemented by giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

In cooperation with Kasisi Agricultural Training Centre