

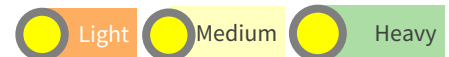
Mulching is the process of introducing vegetative material to the surface of soil in fields to provide soil cover, reduce evaporation, maintaining an even soil temperature and ultimately improve organic content in soil. These materials can include grasses, crop residues, tree bark and other plant materials, even including seaweed if it is available. These materials should be well decomposed, and mixed well into the top soil when the growing season is over. Mulching improves soil fertility by creating a positive soil environment favouring microbial activity and other promoting beneficial organisms such as earthworms, increases moisture retention, stabilises soil temperatures (protecting soils from both heat and cold), reduces soil erosion and restricts weeds. The temperature control keeps roots and plant bulbs cool in the summer and warm in the winter. It can be utilised on all scales of farm, depending upon the availability of input mulch materials. It is considered a climate smart approach as it sequesters carbon in the soil and promotes soil health which in turn maintains agricultural productivity and the ability of a farmer to adapt to climate changes. In some cases, shredded plastic is sometimes used as a synthetic soil cover, but this is not considered climate smart, as it does not integrate organic matter to the soil, instead introducing plastics.

MOST SUITABLE AGRO-ECOLOGICAL CONDITIONS

Value chain



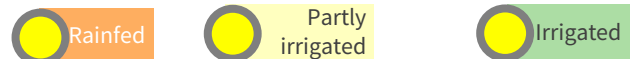
Soil texture



Climatic zone



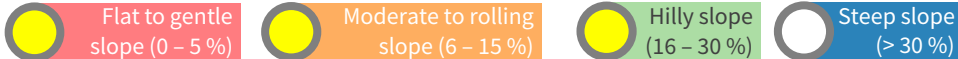
Water source



Annual average rainfall (mm)



Topography



MOST APPROPRIATE CONDITIONS AND REQUIRED INPUTS

Farming system

Does it require collective action



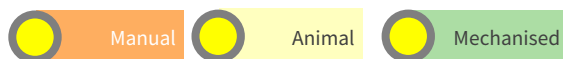
Characteristics



Farm size (ha)

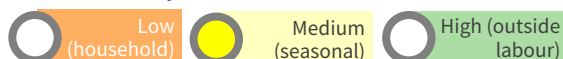


Mechanisation



Human resources

Labour intensity - level of effort

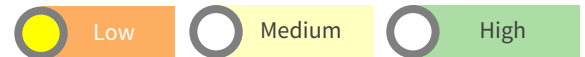


Gender/youth smart (low investment/low labour requirements)

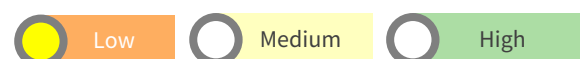


Financial resources

Initial investment



Maintenance Costs



Access to finance capital or credit required



Enabling Environment

Extension support



Access to inputs



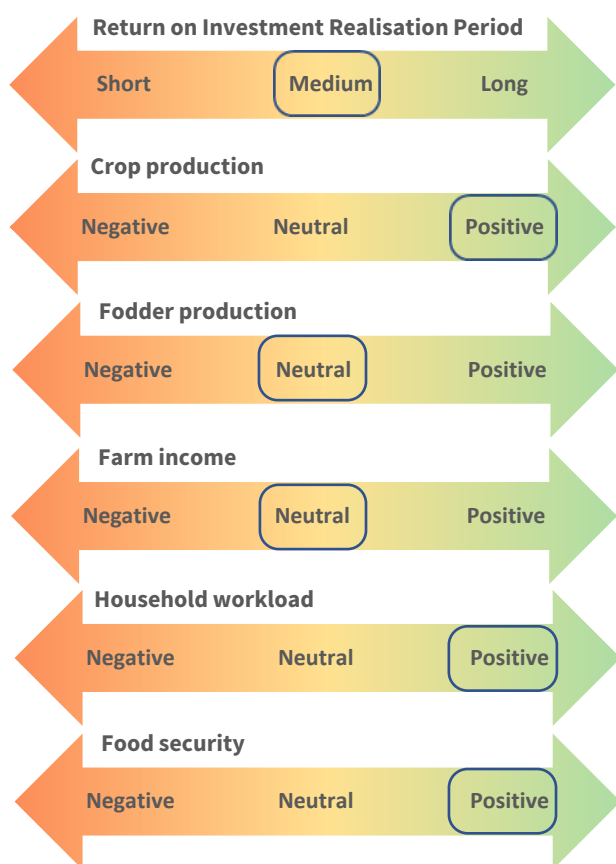
Market access



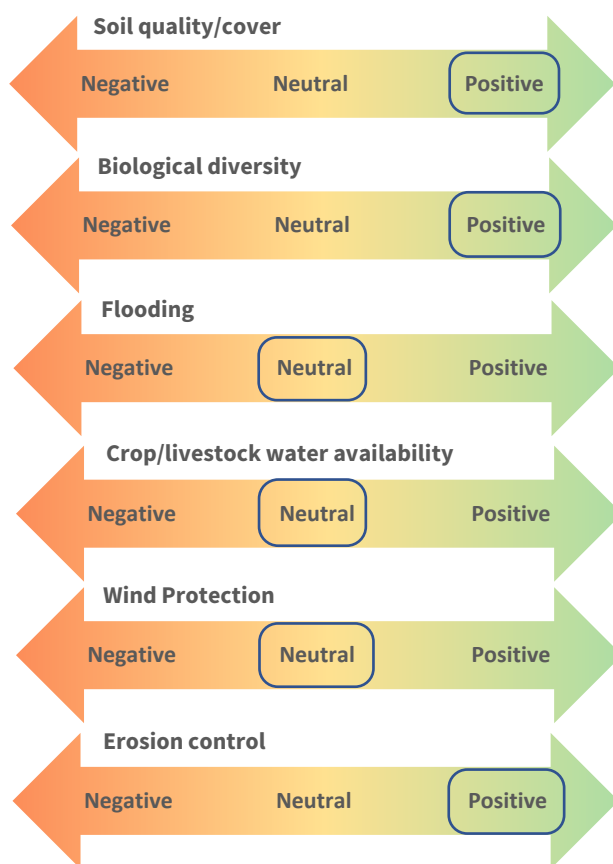
The purpose of this technical brief is to guide where this **practice, technology or strategy** could be applied. It may be applicable in other circumstances, but this brief focuses on where it is possibly **most suitable**. Content is general, and should be contextualised depending upon locality. The brief provides an overview, details of appropriate agroecological characteristics, appropriate conditions and inputs, possible outcomes and impacts, how the **practice, technology or strategy** should be applied, potential benefits and drawbacks, and provides suggestions for further reading in terms of CCARDESA materials and other sources, including those used to develop this technical brief.

POSSIBLE IMPACT/OUTCOMES

Socio-Economic Impacts Positive or Negative



Ecological Impacts Positive or Negative



These descriptors indicate whether the practice, technology or strategy has a positive, neutral, or negative impact or outcome. Those with no box are deemed not-applicable.

TECHNICAL APPLICATION

To effectively undertake mulching the following should be carried out. Tools required: shovel, scissors or shears.

Step 1: Gather organic materials from the farm and other external sources if possible. grasses, crop residues, wood chips, tree backs and other plant materials.

Step 2: Prepare a location to stock-pile mulch material. A large farm will need a substantial area or pit to achieve this. For smaller operations, mulch can be stored in open-topped barrels and bags punctured for air holes. Storage must allow moisture to contribute to the decomposition process, but not become waterlogged.

Step 3: Chop/shred organic material and add to the stock-pile. With larger amounts of material, a motorised, or pedal driven chopper/shredder is useful.

Step 4: Allow materials to decompose, but do not leave for extended periods as nutrients and minerals will be lost.

Step 5: At the end of the growing season, remove any remaining weeds from the soil surface.

Step 6: Spread mulch material over the surface approximately two centimetres deep.

Step 7: In firmer or more compacted top soils, lightly work the mulch into the upper soil.

Step 8: Lightly water area where mulch has been applied.

Mulch should be applied annually as mulching materials will decompose.

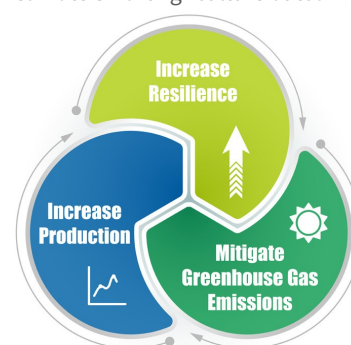
CLIMATE SMART AGRICULTURE OUTCOME(S)

Reflecting how this **practice, technology or strategy** contributes to Climate Smart Agriculture outcomes

Improving soil health through practices such as mulching promotes productivity.

In changing climates, with shifting rain patterns, and increasing temperatures, practices such as mulching help retain soil health.

Mulching provides soil cover, promoting retention of carbon in the soil, and also introducing organic content to the soil itself.



SUMMARY/KEY ISSUES

Benefits

- Mulching improves soil structure, fertility and quality, stabilising soil temperature and retaining moisture.
- Mulching can increase nutrient content in the soil
- Mulch can contribute to reducing soil erosion
- Mulching contributes to preventing weeds from growing.
- If not used, mulch can be sold to other farmers

Drawbacks

- Despite positive benefits, requires substantial labour inputs, hence the need for on-farm labour resources, or the ability to hire
- Mulch can spoil if not managed correctly
- Considerable quantities of mulch are needed to cover fields.
- Again, if not managed correctly, can harbour pests, diseases and weeds (seeds)
- If over-applied, can result in a toxic environment

REFERENCE MATERIAL

CCARDESA Related Content

- CCARDESA, 2019. KP19 Climate Smart Pest and Disease Control for Maize and Sorghum. CCARDESA, Gaborone, Botswana
- CCARDESA 2019. Technical Brief 02. Green Manure. Gaborone, Botswana.
- CCARDESA 2019. Technical Brief 04. Organic Fertilisers. Gaborone, Botswana.
- CCARDESA 2019. Technical Brief 14. Trash Lines. Gaborone, Botswana.

Additional Information

- FAO 2019. [Soil cover](#). Sustainable Agriculture Platform. Rome, Italy.
- Hosbeg N.D. [Advantages and disadvantages of mulch](#). Hosbeg website.
- Farmer's Weekly 2014. [Mulching: what is it and how to do it properly](#). [Farmer's Weekly website](#). South Africa.
- CCAFS 2019. [Climate Smart Agriculture 101](#). CSA Portal. Wageningen, The Netherlands.