Continuous Long Term Proactive Practices

CCARDESA
Centre for Coordination of Agricultural Research and Development for Southern Africa

Technical Brief 56

Cultural pest control practices Are pest control management measures to control pests (insects, diseases, weeds) by manipulation of the environment or implementation of preventive practices including using plants that are resistant to pests, raising the mowing height of pastures to shade out weeds, aerating pastures to reduce compaction and plant stress. Several beneficial cultural practices can meet both demands, helping with pest and disease control and minimizing the use of toxic chemicals. In the insect pest management context, cultural practices may be considered as specific crop production practices that may be implemented either in the initial stages of the organic farm plan but also as a continuous plan to reduce the likelihood of insect pest infestation to a crop and damage. They form part of the Integrated Pest management (IPM) Practices and are based on tactics to disrupt pest infestation of crops by having the crop unavailable to pests in space and time, making the crop unacceptable to pests by interfering with host preference or location, reducing pest survival on the crop by enhancing natural enemies, altering the crop's susceptibility to pests. The tactics or methods used in IPM include one or a combination of the following: Cultural control (crop rotation, use of locally adapted or pest resistant/tolerant varieties, sanitation, manipulating planting/harvest dates to avoid pests). Cultural pest control or IPM results in reduced pests/diseases and increased yields and is a climate-smart practice as its emphasis of prevention helps to control pests and diseases before they occur; its continuous long-term practices without use of chemicals encourage healthier and more pest resilient crops and landscapes, encouraging the use of beneficial insects making it an adaptation benefit. The possibility of prediction and recognition of pest outbreaks enables earlier management consultations and decisions. The reduction in losses results in lower GHG emissions per tonne produced.

MOST SUITABLE AGRO-ECOLOGICAL CONDITIONS

Value chain

- Maize
- Sorghum
- Rice
- Livestock
- Other

Soil texture

- Light
- Medium
- Heavy

Climatic zone

- Arid
- Semi-arid
- Sub-humid
- Humid

Water source

- Rainfed
- Partly irrigated
- Irrigated

Annual average rainfall (mm)

- < 250
- 250 - 500
- 500 - 750
- 750 - 1000
- 1000 - 1500
- > 1500

Topography

- Flat to gentle slope (0 – 5 %)
- Moderate to rolling slope (6 – 15 %)
- Hilly slope (16 – 30 %)
- Steep slope (> 30 %)

MOST APPROPRIATE CONDITIONS AND REQUIRED INPUTS

Farming system

Does it require collective action

- Yes
- **No**

Characteristics

- Subsistence
- Commercial Small
- Commercial Medium
- Commercial Large

Farm size (ha)

- < 2
- 2 to 5
- 5 to 10
- > 10

Mechanisation

- Manual
- Animal
- Mechanised

Human resources

Labour intensity – level of effort

- Low (household)
- Medium (seasonal)
- High (outside labour)

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

- Yes
- No

Financial resources

Initial investment

- Low
- Medium
- High

Maintenance Costs

- Low
- Medium
- High

Access to finance capital or credit required

- Yes
- No

Enabling Environment

Extension support

- Yes
- No

Access to inputs

- Yes
- No

Market access

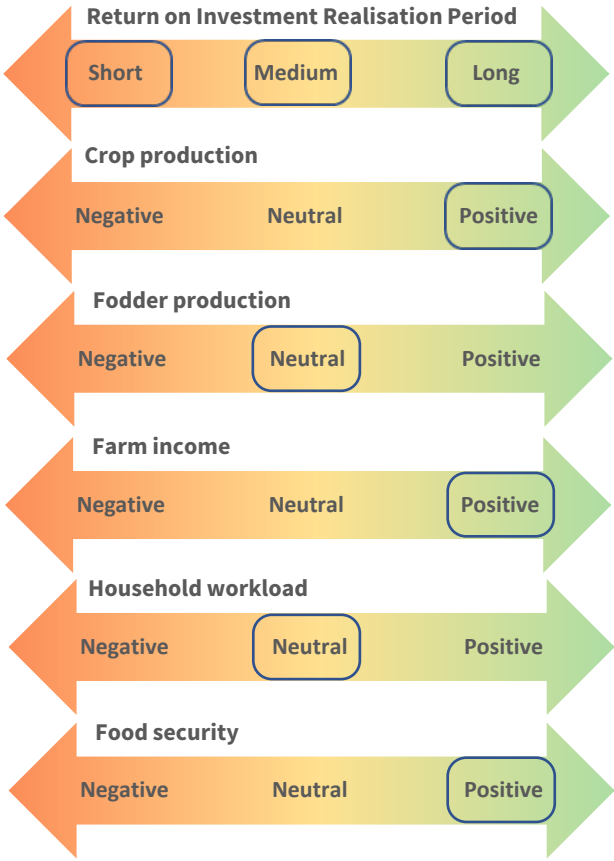
- Yes
- No

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.

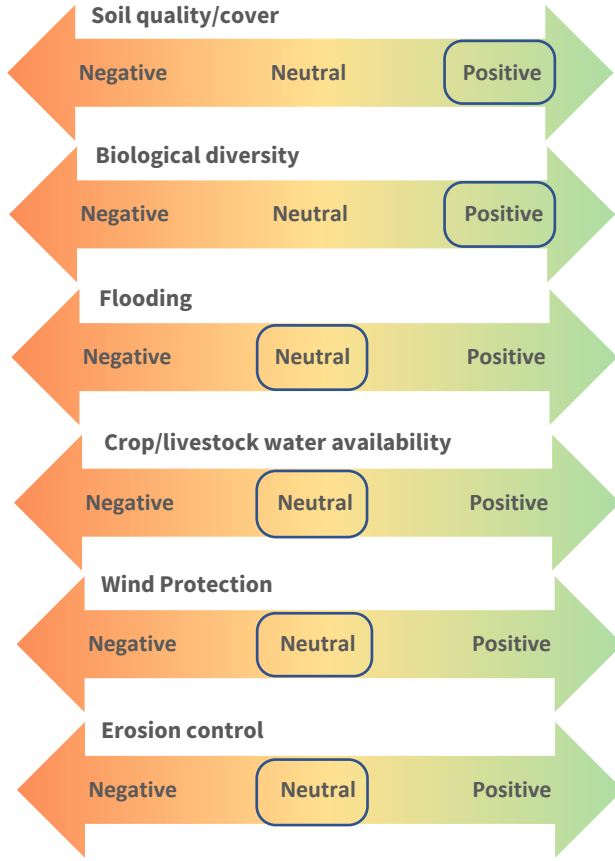
CCARDESA is a subsidiary of SADC, coordinating and harmonising agricultural research and development in Southern Africa.
*This **Technical Brief** is part of a series of materials designed to support **Knowledge Products on climate smart agriculture** available here: www.ccardesa.org/saaiks-knowledge-hub*

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 implement continuous long-term use of cultural practices, the following steps, as part of the Integrated Pest Management (IPM) should be carried out, but before taking any pest control action, IPM first sets an action threshold, a point at which pest populations or environmental conditions indicate that pest control action must be taken:

- **Step 1:** Inspection. The cornerstone of an effective IPM program is a schedule of regular inspections. This should be regular to identify any new visitors to your crop.
- **Step 2:** Preventive Action: regular inspections reveal vulnerabilities in your pest management program, steps can be taken to address them before they cause a real problem. One of the most effective prevention measures is exclusion, i.e., performing structural maintenance e.g by closing potential entry points revealed during inspection thereby physically keeping pests out and hence reducing the need for chemical control.
- **Step 3:** Identification: Different pests have different behaviours. By identifying the problematic species, pests can be eliminated more efficiently and with the least risk of harm to other organisms. Professional pest management always starts with the correct identification of the pest in question .
- **Step 4:** Analysis: Once you have properly identified the pest, you need to figure out why the pest is in your facility, e.g. food debris or moisture accumulation that may be attracting it? What about odors, through floors or cracks, etc.
- **Step 5:** Treatment Selection: Cultural or IPM stresses the use of non-chemical control methods, such as exclusion or trapping, before chemical options. When other control methods have failed or are inappropriate for the situation, chemicals may be used in least volatile formulations in targeted areas to treat the specific pests- use the right treatments in the right places, and only as much as you need to get the job done.
- **Step 6:** Monitoring: Constantly monitoring your facility for pest activity and facility and operational changes can protect against infestation and help eliminate existing ones. Your agricultural extension officer can assist you in technical advice to keep pests away.
- **Step 7: Documentation: Up-to-date pest control documentation is important and could include scope of service, pest activity reports, service reports, corrective action reports, trap layout maps, lists of approved pesticides, pesticide usage reports and applicator licenses**

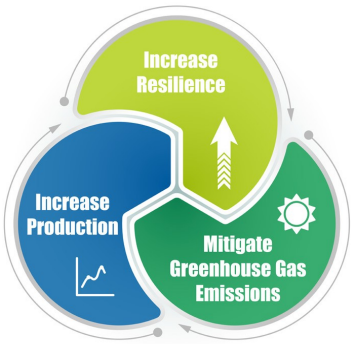
CLIMATE SMART AGRICULTURE OUTCOME(S)

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

Reduced incidence of pests and disease results in higher yields.

Healthier and more pest resilient farm and landscape.
Prediction of pest outbreaks enables earlier management decisions.

Reduced losses result in lowering GHG emissions per tonne produced



SUMMARY/KEY ISSUES

Benefits

- This practice increases yield production, improves soil erosion, enhances soil quality and biological diversity.
- Reduces pollution of soil, water, allows for pollinating insects to thrive, encourages microbe activity in soil formation
- Assists with mitigation of GHG emissions.

Drawbacks

- Consistent management of pest monitoring, pest prevention and agro-ecosystem management.

REFERENCE MATERIAL

CCARDESA Related Content

- CCARDESA, 2019. Technical Brief 19, Climate Smart Pest & Disease Control Options for Sorghum & Maize.

Additional Information

- The Food and Agriculture Organisation (FAO), 2003. Weed Management for Developing Countries. Rome, Italy.
- The Food and Agriculture Organisation (FAO), 1985. Cultural control and the use of resistant varieties in integrated pest management of rice insect and rodent pests. Rome, Italy.

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