



ALTERNATIVE CONTROL OF  
**PLANT**  
PESTS AND DISEASES



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Alternatives for the Disposal of Cotton By-Products and Accessory Crops in Africa  
Beyond Cotton Project (Project-Country: Tanzania)

## **ALTERNATIVE CONTROL OF PLANT PESTS AND DISEASES**

### **Technical Data Sheet**

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# WHAT ARE PLANT PESTS AND DISEASES?

There are many insects and diseases that attack plants. To combat them, in addition to using pesticides, you can employ alternative methods and good cultivation practices for control.

# WHAT ARE PESTS?

Pests are primarily caterpillars, beetles, flies, aphids, mites, scale insects, and slugs. They suck or eat parts of the plants. Pests can also transmit diseases from one plant to another. Mites are very small pests, and scale insects, also small, are pests with scale, half-ball, or flour-like shapes.

FLIES



SLUGS



SCALE INSECTS



CATERPILLAR



MITES



BUGS



ANTS



BEETLES



## WHAT ARE DISEASES?

Diseases are caused by **microbes** that induce spots, wilting, discoloration, or other symptoms that damage parts of the plant or the entire plant. They can be transmitted by pests, through the air, soil, water, or even by humans themselves, as it is not difficult to carry microbes

from a diseased plant to a healthy one on clothing and hands.

Microbes or microorganisms are organisms that cannot be seen with the naked eye. They are very small and usually can only be visualized with the help of a microscope. There are various types of microbes, including bacteria, viruses, fungi, and protozoa.



## WHY AND WHEN TO USE ALTERNATIVE AND NATURAL METHODS?

Whenever commercial chemical products are used, the assistance of a technician is necessary because pesticides are highly poisonous and quite expensive, which can be harmful to your health and your budget. In a small farm, orchard, or garden, it is not worth using these products to control pests and diseases.

Some pesticides kill bees, which are essential for agricultural production. Besides producing honey, they visit flowers to collect pollen and thus aid in the formation of fruits and seeds. Many pesticides also kill spiders and “beneficial” insects that help you control pests. Birds that feed on insects killed by pesticides may die. Therefore, you should use the so-called alternative and natural control methods.

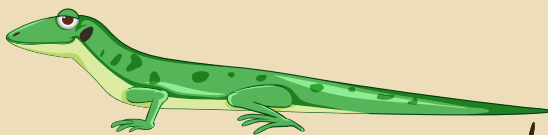


## INCREASE THE NATURAL RESISTANCE OF PLANTS!

Plants are similar to people: if well-nourished, they will better resist pests and diseases. Therefore, it is very important to fertilize the plants.

## PROTECT PLANT FRIENDS!

If you observe the plants, you will notice that there are some creatures that attack and eat pests. Birds like thrushes, owls, and many others, frogs, lizards (geckos), and chickens all help control pests. Spiders and insects like ladybugs, small or large wasps, and mantises kill and eat pests. Therefore, these creatures are called beneficial, as they help combat pests.








## **USE MANUAL OR HOMEMADE METHODS OF PEST CONTROL!!**

If you observe that some insects are eating or sucking leaves and stems, piercing or eating fruits, do the following:

 Collect and crush caterpillars and pest eggs.

 Place a piece of yellow plastic coated with oil (or grease) next to the beds, as if it were a sign. Many insects will be attracted to the yellow colour and get stuck in the oil.

 Install light traps.

 Use wet bags to catch slugs and caterpillars.

 Employ living barriers

 Utilize homemade insecticides.

## LIGHT TRAP

The light trap is nothing more than a lantern placed above a basin with water or burned oil. These traps are used at night because the light attracts insects, which fall into the basin and die. Place the trap near the beds or the planted area.



## WET BAGS AGAINST SLUGS AND GROUND CATERpillARS

To combat slugs and cutworms, place some wet bags near the beds or the affected plants in the late afternoon. These pests usually hide under the wet bags before dawn. In the morning, lift the bags and eliminate the slugs and caterpillars.

## LIVING BARRIERS

Use living barriers to restrain harmful insects before they reach your plantation. Create a barrier with sesame to control leaf-cutting ants. If you plant a row of corn around the area where the plants are, pests flying toward them will stop at the corn stalks.





## TOBACCO AND SOAP SOLUTION

This serves to combat aphids, caterpillars, mites, and scale insects.

### Tobacco Leaf Infusion (Nicotiana tabacum)

Mix 250 g of tobacco leaves with 20 litres of water. Soak for at least 24 hours.

**Indications:** Tobacco is an excellent contact insecticide with action against aphids, beetles, scale insects, caterpillars, and other pests.

### Tobacco Infusion (Nicotiana tabacum) + Soap Water

Chop half a palm of rope tobacco and place it in 1 litre of water with 1 cup (coffee cup) of alcohol. Soak for 24 hours. Then strain and store the solution in a dark glass container with a lid and a label identifying its contents.

Mix 1 tablespoon of grated neutral soap in 1 litre of hot water. Shake until dissolved.

Store in a glass container with a lid and a label identifying its contents.

### HOW TO APPLY:

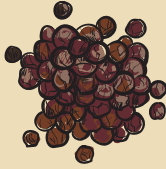
When it's time to use, mix the tobacco infusion with the soapy water:

- Add 5 tablespoons of the tobacco infusion to 1 litre of water and combine it with 1 litre of soapy water.
- Spray or water the plants with this mixture, making sure to thoroughly wet, especially underneath the leaves.

### ATTENTION!

The harvest of the treated vegetable should be done only 7 days after the tobacco application. Tobacco should not be used on plants belonging to the potato or tomato family (Solanaceae).

# REPELLENT WITH BLACK PEPPER, GARLIC, AND SOAP



## Black Pepper Extract

- Mix 100 grams of black pepper in a 1-liter water bottle or in a glass jar with a lid.
- Let it sit for a week.
- Strain and store in a glass jar with a lid and a label identifying its contents.



## Garlic Extract

- Mix 100 grams of crushed garlic in a bottle with 1 litre of water or in a glass jar with a lid.
- Let it sit for a week.
- Strain and store in a glass jar with a lid and a label identifying its contents.

## HOW TO APPLY:

- Dissolve 50 grams of soap in 1 litre of hot water.
- Add 1 cup of the black pepper extract liquid.
- Add half a cup of the garlic extract liquid.
- Mix well, then add water to make up to a can (20 litres).
- Apply with a sprayer or watering can.

**Indications:** Garlic is an effective repellent for insects, bacteria, fungi, soil worms, and serves as an inhibitor of insect digestion.

## ASH SOLUTION AS A REPELLENT

- Mix 2 kilograms of wood ash (from the wood stove residue) in 10 litres of water.
- Let the mixture rest for a day.
- Strain and spray or water the plants.
- To control weevils in grains, mix 50 grams of ash with 50 kg of clean and dry grain.

**Indications:** Controls pests in stored grains.

## REPELLENT WITH RUE LEAVES (RUTA GRAVEOLENS) FOR VARIOUS INSECTS AND ANTS

- Place 100 grams of chopped rue leaves in 2 litres of water.
- Let it rest for 24 hours.
- Strain and mix with a can of water (20 litres).
- Spray or water on plants or in places where ants appear



## LEAF OF NEEM (AZADIRACHTA INDICA)

Mix 250g of chopped leaves, seeds, and green branches with 20 litres of water. Let the leaves soak in the water overnight. Strain and spray.

**Indications:** Neem serves as a repellent for a wide variety of insects, including caterpillars, beetles, bugs, aphids, whiteflies, scale insects, horn fly, grasshoppers, nematodes, crickets.

## COW URINE

Collect urine during milking in a bucket, then transfer it to a container with a lid and let the cow urine rest for 4 days in a dry, cool place away from the sun.

- **SOIL APPLICATION:** Mix 1 litre of cow urine in 20 litres of water and apply to the soil near the plant. The application should be repeated every three months.

- **FOLIAR APPLICATION:** Mix 200 ml of cow urine in 20 litres of water and apply to the entire plant, especially on the underside of the leaves. Repeat the application at monthly intervals.

- **SEED TREATMENT FOR PLANTING:** Seed inoculation with cow urine.

**Step 1 :** In a clean container, immerse the seeds to be treated in pure cow urine (undiluted). This should last for a period of 30 seconds to 1 minute to avoid harming the seeds.

**Step 2:** Dry the seeds in the shade and plant them immediately afterward.

**Indications:** It primarily serves to combat attacks from flies, aphids, and caterpillars. At the same time, it acts as a fertilizer.

IT IS ADVISABLE TO WAIT 7 DAYS AFTER APPLICATION FOR HARVESTING AND CONSUMPTION.

## CARE IN THE APPLICATION OF PESTICIDES



The recommended pesticides should be used immediately after mixing with water. The application can be done with a garden sprayer or mini sprayer, with a directed spray to the upper and lower surfaces of leaves and to buds and small fruits.

Homemade preparations, commercially available products based on vegetable oils, as well as biological insecticides containing the *B. thuringiensis* bacterium, should be sprayed in light wind and late in the afternoon when temperatures are milder and the sun is weaker.

Do not apply them on rainy days or when there is a possibility of rain after spraying.

When necessary, the treatment should be repeated at seven-day intervals. Avoid applying a mixture of pesticides (biological and botanical pesticides, and these with phytoprotective solutions with fungicidal action). To ensure the food's taste quality, it is recommended to stop using all pesticides 96 hours before consuming vegetables. In the handling and use of pesticides, always use personal protective equipment (mask, goggles, gloves, boots, coveralls, and apron) to prevent allergic reactions and potential skin burns.

