

3. Pest and disease management



Above is a picture showing some of the useful insects, predators and animals in your garden. All these creatures are our friends and help to control pests

Diversity is good

- ❖ Work with nature and copy the natural ways in which plants grow. Insects and "weeds" are a part of nature. We can learn to encourage those insects and plants that help us in the garden. Ladybirds, praying mantis, lacewings, wasps, frogs, lizards and birds all eat the insect pests that harm our gardens. They are called predators. If you leave them in your garden, they will help you!
- ❖ We have talked of planting different vegetables together (companion planting) and of rotation (See the *Planting Crops* leaflet in this series) It is also possible to mix vegetables with other plants- strong smelling plants that deter pests and attract predators

In the picture above, nasturtiums and peppermint are planted with the vegetables.

Below are some strong smelling plants that you can grow with your vegetables

Pyrethrum and Feverfew

These plants belong to the *Chrysanthemum* family. They have small white flowers, which are also very decorative in the garden and contain a poison for insects. They can be planted as borders along your beds, or dotted throughout your garden.



You can buy seeds for these plants. Write to the following address:

Mahlathini Organics, PO Box 807, Richmond, 3780, KZN, South Africa.



Marigolds (*Tagetes spp*)

Can be used in the same way. They have the added advantage of deterring nematodes (tiny worms that attack the roots of plants) in the soil.



Different kinds of nematodes

Fennel

Fennel is a great plant for attracting wasps. Wasps lay their eggs in caterpillars and can kill many of them in one day!



Wasp

Wormwood (*Artemisia affra*) or Lengana

These plants grow as large bushes and should be placed at the edges of your beds, or given their own space to grow. A tea made from the leaves is also a good medicine for fevers and colds.



Khakibos/senkhanes and blackjacks

These weeds are useful to deter pests. Keep a few in the garden!

An inter-crop of cauliflowers, lettuce, fennel and onion can give complete control of aphids (hoaba) and diamondback moth. This means you will have no attacks!!!



Diamond back moth and its larvae

GROW STRONG, HEALTHY PLANTS

Pests and diseases do not attack healthy plants.

- ❖ Fertile soil, fed each year with compost and manure will produce healthy plants. Make sure that your plants are not short of water.
- ❖ Select the best plants at harvest time from which to collect seeds.
- ❖ Use strong, healthy seeds and seedlings. If your plants do not have a good start, they will not get better later! Rather start again.
- ❖ Plant the vegetables in the correct season. (See the *Planting Crops* leaflet in this series). Early planting of some crops can protect them from the worst attacks. Examples are stalk borer in maize and blight in potatoes.

- ❖ Mulch! (See the *Mulching* leaflet in this series)
- ❖ When you are weeding, do not let the rubbish lie around your garden. The smell attracts pests. The best liquid manures are made from weeds (See the *Improving Your Soil* leaflet in this series). Otherwise, place the weeds on your compost pile.

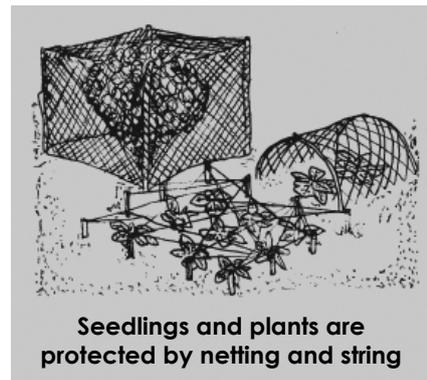
If prevention does not totally succeed in a pest and disease free crop, then there are a number of ways in which to control these problems.

PHYSICAL CONTROLS

Birds:

Birds can be kept away from your crops in the following ways:

- ❖ Use 4 sticks and some netting to make a cage
- ❖ Cover seedlings with netting or wire stretched across a hoop
- ❖ Or make a mesh of string wound around wooden pegs.
- ❖ Scare crows still work well, as long as you move them quite often. The birds will get used to them after a while



Cutworms:

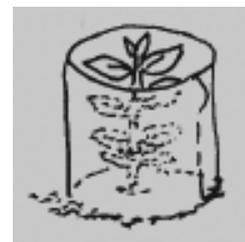
These are fat brown or grey worms that live just under the surface of the soil and cut the stems of small plants as they are feeding.

- ❖ Cutworms can be collected in the early morning by digging with your finger in the soil, around the small plants that have been cut. The worm can be removed and fed to your chickens or destroyed.



Cutworm and moth

- ❖ Collars can be made for the seedlings. These are placed around the seedlings when they are planted. Be sure to press the collar quite deep into the soil (at least 3 cm, which is the width of 2 fingers), otherwise the worms will burrow underneath the collar. Collars can be made from stiff paper, cardboard or rings of plastic cut from bottles.

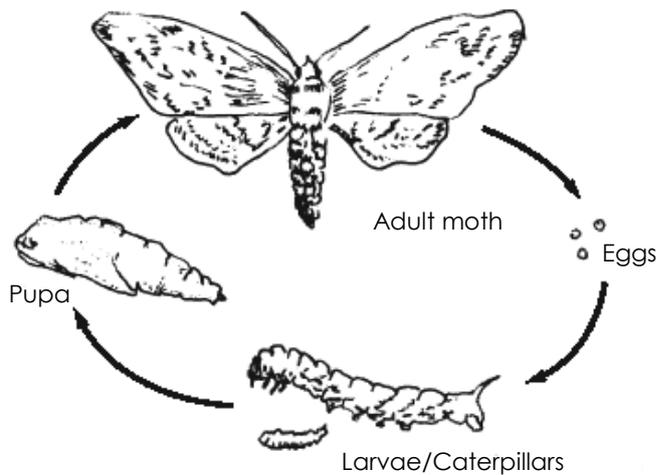


Cutworm collar around seedlings

From: Production without Destruction, 1995

Many worms/caterpillars have the following life cycle:

A moth lays eggs, which hatch into larvae/worms/ caterpillars. They feed on the plants. They then turn into pupae, which do not feed. The pupae turn into moths, which do not feed, but lay eggs. And so on.



Life cycle of some insects

From: Production without Destruction, 1995



Light trap for moths and other insects

It is possible to attract many different kinds of moths with light traps. These are put out at night. Using a light trap will reduce the egg laying of many different moths.

Snails and slugs:

From: The Complete Book of Self Sufficiency



Dish set in the ground with fermented liquid, to attract slugs and snails

- ❖ They can be picked off by hand and placed in a bucket of water, or feed them to your chickens. They will love to eat them.

- ❖ A saucer or shallow dish with beer or any fermenting liquid can be placed so that the rim is level with the ground. Slugs and snails will be attracted to this liquid. Here they will either fall in, or they can be collected and fed to your chickens, or destroyed.



Snail

HERB AND PLANT TEAS

Many different plant mixtures can be used to control insects and diseases. These remedies should only be used if all the other methods fail. The main advantage of natural remedies is that they are cheap. They can be prepared at home.

Controlling pests and diseases



General points for making plant sprays

- ❖ Soap (green bar soap only!) can be added to the mixture to make the spray stick to the plants and insects. Do not use liquid soap or soap powder.
- ❖ The mixtures can be filtered through thin cloth to remove the bits of plant material. They can be applied using a homemade brush from grass or twigs.
- ❖ These sprays act as contact poisons. So make sure you cover the insects or disease symptoms well.
- ❖ Some sprays can burn the plants if they are too strong. First test your spray on a few plants.
- ❖ The best time to spray against insects is in the late afternoon.
- ❖ The sprays are washed off in rain and have to be re-applied.

IMPORTANT:

These sprays are still poisons. Make sure that children cannot reach your preparations. If you boil up your mixtures, use an old pot, no longer used for cooking. Wear gloves if you can!



Below is a listing of some of the plants, how the remedy is prepared and what it is used for:

Aloe

Any kind of aloe can be used.

- ❖ Crush the leaves in water (1:5). This means use 5 times as much water as you use leaf material. Filter through a fine cloth and use as a spray.
- ❖ OR Dry the leaves and grind them into a powder. This can be dusted onto seeds and plants.

CONTROL:

- ❖ Insects in general; grasshoppers, aphids, caterpillars;
- ❖ Pests in stored grains such as maize, wheat and sorghum;
- ❖ Termites and ants.



Aphids



Ants



Termite



Grasshopper

Amaranthus



Extract the juice from 1kg of leaves (1 kg is about one plastic shopping bag full of leaves). This can be done by cutting the leaves and then pounding them with a stone. Then mix this juice with 3 litres of soapy water and spray.

CONTROL:

Various spotty diseases caused by fungi such as leaf spot and blight.

Wormwood (Lengana/ Umhlonyane)

Cut up the leaves into water (1:4) and stand for 2-7 days before using. Add some soap to the mixture.

CONTROL:

Insects in general and snails.

Snail

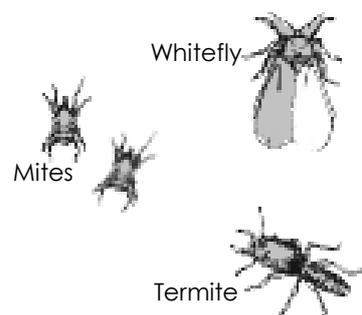


Blackjack

Cover a cupful of seeds with water and boil for 10 minutes, or let it stand overnight. Add 1 litre of soapy water and spray.

CONTROL:

Insects in general; aphids, ants, beetles, caterpillars, cutworms, mites, termites and whitefly.



Mites

Whitefly

Termite

Chilli

- ❖ Chop up one cupful of hot red chillies.
(Be really careful not to rub your eyes!)
- ❖ Add 2 litres of water.
- ❖ Either leave this to stand in the water for 2-3 days or boil for 15 minutes.
- ❖ Add half a cup of soap shavings and mix until this has dissolved.
- ❖ Filter the solution to remove the pieces of chilli.
- ❖ During dry weather, apply once a week.

Caterpillar



Aphid



Ants



This mixture can burn the leaves of plants if it is too strong!

CONTROL:

Caterpillars, aphids and ants.

Garlic and onion



Crush 3 big bulbs of garlic (or 1-2 onions) and soak them in 2 spoons of cooking oil or paraffin for 2 days. Filter and mix with 1 litre of soapy water. Dilute this mixture 1:10 with water and use as a spray.

CONTROL:

Insects in general: aphids, mites, wireworms, termites and ants. Diseases such as leafspot, blight and damping off. Examples are bean rust and tomato blight.

Aphids



Mites



Ants



Termite



Marigolds

Use the whole plant. Take 2-4 plants and crush the leaves, roots and flowers. Pour on 1 litre of boiling water and soak for one day. Then add 1 litre of cold soapy water and spray this on your plants. The coarse plant materials remaining behind can be used as mulch around your plants.

CONTROL:

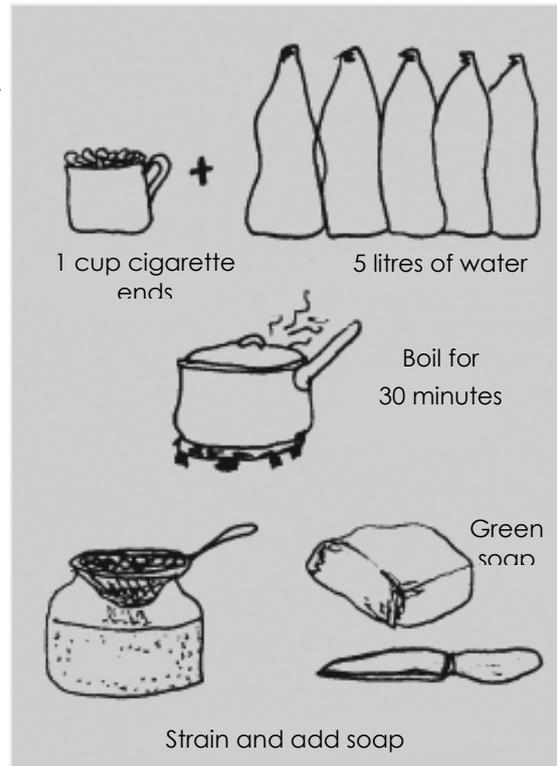
Insects in general: ants, aphids, beetles, stalk borer. Disease in general: leafspot and blight (early blight and late blight).

Tobacco



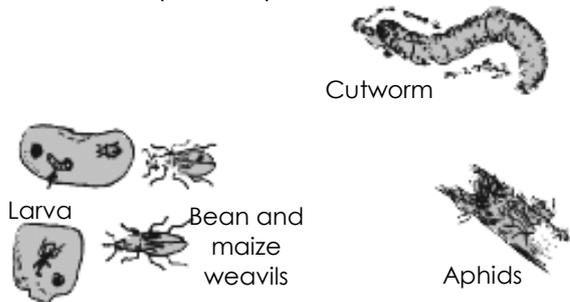
WARNING: Tobacco is very poisonous to all insects and to people. Be very careful with these preparations.

- ❖ Take 2 handfuls of dry leaves or cigarette ends. This is the same as one cup full.
- ❖ Add 5 litres of water and boil for 30 minutes. Filter. Then add soap, mix and let your remedy cool. Apply once a week.



CONTROL:

Cutworms, caterpillars, aphids, flies and weevils.

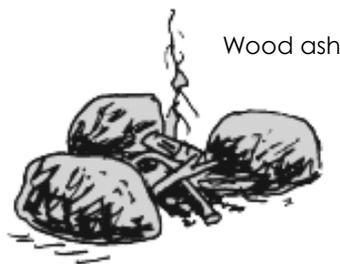


Organic remedies

These remedies are made from organic materials, not from plants. Some examples are given below:

Wood ash

- ❖ Mix one heaped spoon of wood ash in 1 litre of soapy water. Leave it overnight. Spray against insects in general
- ❖ Mix one heaped spoon of wood ash in 1 litre of soapy water. Mix in one cup of sour milk and add 3 litres of water.



CONTROL: Mildew on plants and most insects.

- ❖ Spread the wood ash in a circle around the base of your plants and water it into the soil a bit.

CONTROL: Snails, slugs and cutworms



Flour

Mix one big spoon of flour into 1 litre of water. Brush this on the underside of leaves where mites and aphids are. Apply in the morning of a sunny day.



CONTROL:

Spider mites, caterpillars and aphids.



Caterpillar

Milk

Spray a mixture of 1 litre of milk and 10 litres of water to control spider mites and diseases such as mildew on pumpkins, blight on tomatoes and potatoes and mosaic virus on peppers. Do this every 10 days.

Liquid manures/compost teas

See the Improving Your Soil handout. This explains how to make liquid manures.

- ❖ Mix one spade full of compost or manure in 10 litres of water.
- ❖ Let this mixture stand for 10-14 days.
- ❖ Dilute animal manures 1:4. Use compost tea as is.
- ❖ Spray these onto your plants every 7-10 days.

CONTROL:

Generally protects against insect and disease attacks. Can repel aphids, caterpillars, grasshoppers, beetles, mites and cutworms.



Aphids



Caterpillar



Cutworm



Mites



Grasshopper