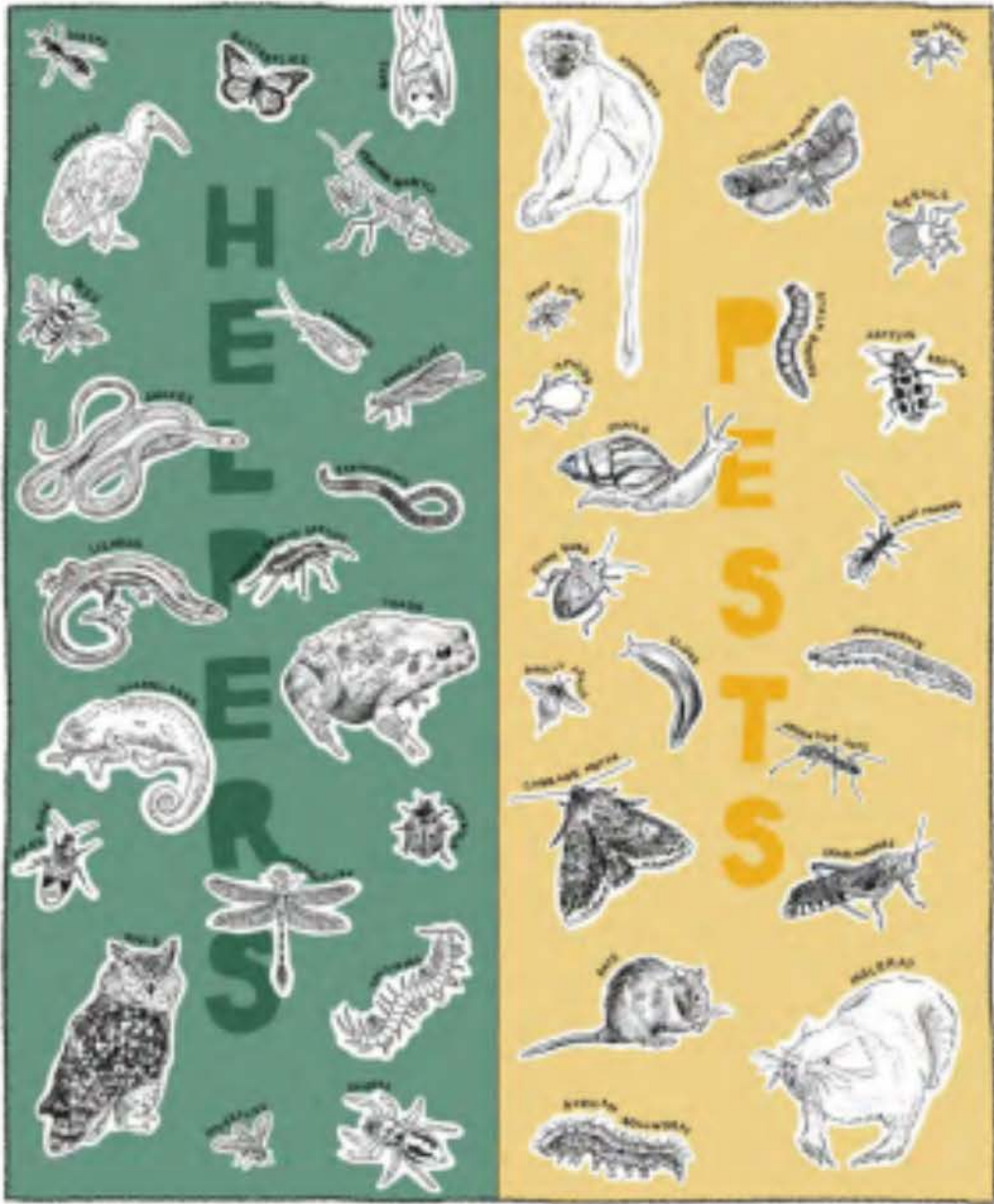


# Food Security Training

# PESTS



# Creating balance & harmony



## NATURAL PEST & DISEASE REMEDIES

The important first step is figuring out what is causing the problem in your garden. You need to know if your plants have been attacked by a pest or disease, or some other problem such as these below.

Problem	Possible cause	Response
Yellowing and wilting of leaves	Over-watering	Check what the water requirements of the particular crop is, and use the finger-in-soil test to see when more watering is needed.
Browning of leaves, wilting and leaf fall	A lack of water or drought	If you have severe water shortages, consider setting up a greywater filter system and mulching.
Spindly, tall plants	Too much shade	Consider replanting to a sunnier spot.
Holes in leaves and damage to flowers and fruit	Heavy rain and/or hailstorms	Consider using moveable frames with covers of shade cloth, thatch, reeds or other materials to protect your crops in storms
Burn-type marks on leaves, flowers & fruits	Freezing from frost	During frost times, make sure to water your plants only in the morning as this gives enough time for the water to dry before the cold night. Also consider protective frames as above.

Problem	Possible cause	Response
Shredded leaves and broken branches	Excessively strong winds	Create moveable windbreaks. If the strong winds come often from the same direction, consider planting a permanent windbreak.
Plant's growth is stunted or the leaves are pale green and small	Nutrient deficiency, making it more likely to be attacked by diseases or pests.	There's an array of various methods to help get more nutrients to your plant in the Composting section and the Fertiliser section.

## INSECT VERSUS DISEASE

If the problem in your garden is not caused by any of the reasons in the table above, then you need to try to determine if the trouble is being created by a disease or insect/pest. Insects generally either chew a plant or suck/bore juices from it. A chewing insect (for example, a locust) would make marks on the edges of leaves like small bite marks. Another chewing insect is a caterpillar, which creates holes all over the leaves that vary in size and the hole edges are rough. You may find tiny dark faecal droppings around. Other chewing insects include beetles which make small, rough holes on leaf edges at first, and then between the veins of leaves or consume the entire leaf.

A sucking insect (for example, a snail) would leave holes with smoother edges more on the central areas of leaves, and possibly a tell-tale trail of slime! Another sucking insect is the aphid, which leaves tiny small holes over the surface of the leaf that then become discoloured.





# Creating balance & harmony

## Natural remedies for pests

Method	Pests Treated	Process
Aloe	Grasshoppers, aphids, caterpillars, termites, ants, pests in stored grains	1) Crush the leaves of any aloe into very small pieces, and mix in water (1 part aloe to 5 parts water). Let soak for a day or two, then filter through fabric, and use as a spray or sprinkle with a brush.  2) Dry the aloe leaves and then grind them into a powder. This can be dusted onto seeds and plants.
Amadumbe	Mole rats	Amadumbe is toxic if eaten raw, so mole rats avoid them. The amadumbe can be planted as a protective repellent to mole rats.
Artemisia/Mhlonyane	Ants aphids, flea beetles, flies, cabbage white butterflies, slugs, red spider mites	Take a handful of artemisia/mhlonyane (all parts of plant) and pour 1 litre of boiling water over. Allow to cool, filter out the plant debris, then use as spray or sprinkle with a brush 2 or 3 times over a 1-week period.  Do NOT put the plant debris in your compost pile - it is so potent that it could stop the microorganisms doing their important decomposition work in your pile.
Ash	Snails, slugs, cutworms	Spread wood ash in a circle around the base of your plants, and water it into the soil a bit.

Method	Pests Treated	Process
Beer	Snails	Put a shallow container of beer in your garden. Snails will climb in and never come out.
Blackjack/uqadolo	Aphids, ants, beetles, caterpillars, cutworms, mites, termites, whitefly and other insects	All parts of blackjack/uqadolo can be used, especially the seeds. Chop up the plant parts and put in a pot. Add enough water to cover and bring to the boil for 10 minutes. Let it sit overnight. Filter the solution through fabric to remove the plant debris. Add ¼ cup of soap shavings and mix until this has dissolved. Use as a spray or sprinkle with a brush.
Bug tea	Snails, beetles, caterpillars, etc.	This approach makes a tea out of a particular bug, and then is used to repel the same bugs (as no creature likes the smell of its own dead). Collect ½ cup of the particular insect you are having a problem with, and place in a container with a lid. Add 1 litre of boiling water, cover and let sit for 5 days. Filter the liquid, add ½ teaspoon of liquid soap and mix until this has dissolved. Use as a spray or sprinkle with a brush.
Chilli	Caterpillars, aphids and ants	Chop up one cup of hot red chillies and add to two litres of water. Let this stand for 3 days. Filter the solution through fabric to remove the chilli pieces. Add ½ cup of soap shavings and mix until this has dissolved. Apply once a week during dry weather.
Coffee	Tiny insects, snails and slugs	Coffee can be fatal to tiny insects. Make a weak solution of 1 teaspoon coffee to 1 litre hot water. Let it cool then use as a spray or sprinkle with a brush.  Leftover coffee grounds can be sprinkled around plants or along edges of garden beds to repel snails and slugs.

Method	Pests Treated	Process
Diatomite	Soft-bodied insects	Buy powdered diatomite, also known as diatomaceous earth, from agricultural or gardening stores (it should be inexpensive, but do not buy the diatomite meant for swimming pool filters as this powder has added chemicals in it). Diatomite powder acts like a million tiny razor blades on soft-bodied pests like the cabbage white butterfly caterpillar. Put the diatomite powder in a duster bottle and dust around the base of the plants in the late afternoon / early evening. Also dust the stem and the top and underside of the leaves. You will need to dust again after rain.  <b>Warning:</b> be careful to not inhale the powder.
Eggshells	Snails, slugs, cutworms	Crushed eggshells scattered around plants or along the edges of your garden beds help to repel snails, slugs and cutworms.
Flour	Red spider mites, caterpillars and aphids	Mix 1 big spoon of flour into 1 litre of water. Stir well. Brush this on the undersides of leaves where the mites and aphids are. Apply in the morning on a sunny day.
Flour, ash & salt	Cabbage caterpillars	Mix two handfuls of flour and two handfuls of wood ash together, and add ½ cup of salt. Use this as a dust on the plants to kill the caterpillars.
Mint	Aphids, and general flying insect repellent	Add 100 grams of chopped mint leaves to 1 litre of cold water and bring to the boil. Remove immediately from the heat, allow to cool, and filter out the plant debris (which can be composted). Use undiluted as a spray or sprinkle with a brush.

Method	Pests Treated	Process
Plastic bottle Fruit Fly trap	Fruit flies	Take an old 2 litre cold drink bottle with the lid on. Heat a thin nail over a flame and pierce small holes in the neck of the bottle and in the lid. These holes should be big enough to let fruit flies in, but too small for beneficial insects like bees. Then cut off the neck of the bottle. Add some rotten fruit into the base of the bottle. Invert the bottle neck into the base and make two holes on either side. Use string or metal to tie this trap close to where the fruit flies are.
Tobacco	ONLY TO BE USED IN SEVERE CASES: Cutworms, caterpillars, aphids, flies & weevils	If infestation is really bad and the other natural methods are not working fast enough, then use this remedy but with caution. Tobacco is very poisonous to ALL insects (the good ones too, like bees) and to people. Thus be very careful with these preparations.  Take 2 handfuls of dried leaves or a cup of cigarettes. Tear leaves into small pieces or break up cigarettes (and throw away the cigarette filters). Add to a big pot with 5 litres of water and boil for 30 minutes. When cool, filter the solution through fabric to remove the plant materials. (Throw these materials away - do NOT add to your compost.) Add ½ cup of soap shavings to the filtered liquid and mix until this has dissolved. Use as a spray or sprinkle with a brush once a week.  Do not use this remedy regularly as it is so poisonous. This is only to be used in very severe cases of insect infestations.





# Creating balance & harmony

## Natural remedies for diseases

Method	Diseases Treated	Process
Bicarbonate of Soda	General fungicide and powdery mildew	Add 2 tablespoons of bicarbonate with 5 litres of water, 1 teaspoon of liquid soap and 1 tablespoon of paraffin oil. Mix well together. Use twice a week as a spray or sprinkle with a brush.
Chamomile	Fungal disease	Add ½ cup of chamomile flowers to 2 litres of water and bring to boil. Remove immediately from the heat, allow it to cool, and filter out the plant debris (which can be composted). Use as a spray or sprinkle with a brush. This keeps for about a week before going off.
Epsom salts	Plants with yellowing leaves after aphid or similar attack	After plants have been attacked by sucking insects, their leaves often yellow as the plants become deficient in magnesium. Dissolve 50 grams of Epsom salts (which is full of magnesium) in 4 litres of water and use as a foliage and root feed.
Yarrow	Fungal diseases such as powdery mildew	Add 50 grams of yarrow flowers to 5 litres of cold water and bring to the boil. Remove immediately from the heat, allow it to cool, and filter out the plant debris (which can be composted). Dilute 1 part yarrow "tea" to 10 parts water, and use as a spray or sprinkle with a brush.

## Natural remedies for pests & diseases

Method	Pests & Diseases Treated	Process
Ash & Sour Milk	<u>Pests:</u> most insects. <u>Diseases:</u> mildew and mould.	Mix 1 heaped big spoon of wood ash in 1 litre of water, and let it sit overnight. Add ½ cup of soap shavings and mix until this has dissolved. Add 1 cup of sour milk and 3 more litres of water. Use immediately as a spray or sprinkle with a brush.
Garlic	<u>Pests:</u> aphids, mites, wireworms, termites, ants, slugs, snails & other insects. <u>Diseases:</u> fungal infections such as damping off, leaf-spot and blight, (e.g. bean rust & tomato blight)	Cut 10 big bulbs of garlic into very small pieces and add to 1 litre of boiling water. Once it is cool, filter out the pieces of garlic. Add ½ cup of soap shavings and mix until this has dissolved. Use as a spray or sprinkle with a brush.
Khakibos / umansangwana	<u>Pests:</u> ants, aphids, beetles, stalk borer & other insects. <u>Diseases:</u> leaf-spot, early and late blight, and other diseases.	Take 2 - 4 plants and cut up the leaves, stems, roots and flowers. Put into a container and add 1 litre boiling water. Let sit for 1 - 2 days. Filter out the plant materials, and then add 1 litre of cold water and ½ cup of soap shavings and mix until this has dissolved. Use as a spray or sprinkle with a brush. The remaining plant materials can be used as a mulch around your plants.

Method	Pests & Diseases Treated	Process
Garlic, onion & chilli	Antibiotic, antiseptic and broad spectrum fungicide, insecticide and pest repellent.  <u>Pests:</u> aphids, cabbage butterfly, mites, scale, thrips, tomato flies, green flies, white flies, caterpillars, cutworms, red spider mites, all kinds of beetles, all kinds of moths, ants, termites, snails and slugs, mole rats.  <u>Diseases:</u> Fungal, bacterial and blight attacks.	<p>This is a powerful mix, so use carefully. Roughly chop a handful of garlic and 4 onions, including skins and leaves if possible. Add a big heaped spoon of crushed, dried or fresh chilli. Pour over 3 litres of boiling water, close the container and let sit for 24 hours. Filter out the plant debris. Add 2 tablespoons of cooking oil and 2 tablespoons of liquid soap (or heaped spoons of grated soap). Mix well.</p> <p>Dilute 1 cup of this with 4 cups of warm water. To check if it is too strong, use on two leaves of a plant and wait for 3 hours. Dilute further if necessary. Spray or sprinkle with a brush.</p> <p>This is a powerful spray that can kill beneficial insects too, so use it with great care only when absolutely necessary. Also use only in late afternoon or early evening. Do not spray too much as it can burn tender plants. Do not use it on legume plants (beans, peas, etc).</p> <p>For mole rats, use this liquid to drench the soil between your garden and the mole rat's newest mound of soil that they've pushed to the surface. This will repel them away, and you can use this method over a week to chase the mole rats out of your property by continuing to drench the soil over their tunnels.</p>

Method	Pests & Diseases Treated	Process
Milk	<u>Pests:</u> red spider mites, caterpillars, tomato worms. <u>Diseases:</u> blight on tomatoes, mildew on pumpkins, mosaic virus on peppers	Mix 1 litre of milk and 10 litres of water. Use twice weekly as a spray or sprinkle with a brush.
Nettles	<u>Pests:</u> snails <u>Diseases:</u> downy mildew	Pack whole stinging nettle plants into a bucket and cover with water. Let sit for 2 weeks. Filter out the plant materials (which can be added to your compost or used as a mulch). Dilute 1 part liquid to 4 parts water and spray/sprinkle as needed.
Onion	General fungicide, insecticide and insect repellent	Chop one big onion into small pieces (with skin and leaves if you have them). Add to 1 litre of water in a container with a lid. Let sit for a week. Strain the mixture and spray or sprinkle onto affected plants.

