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For Citizens

# Pesticide-Free Methods Practical Guidebook for Citizens

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Zehirsiz  
Kentler



# Pesticide-Free Towns Practical Guidebook for Citizens



**Buğday Association for Supporting Ecological Living** aims to create ecological living conscience and awareness in the society both on the individual basis and as a whole; to offer solutions to the problems arising due to the irreversible destruction of the ecological systems; and to support living in harmony with nature. Buğday Association creates and supports best practices and shares knowledge and experience on ecological living.



**PAN Europe** brings together 38 members across Europe and aims to minimise pesticide use and promote ecologically sound alternatives to chemical pest control. In order to achieve this vision, PAN Europe carries out advocacy, policy analysis, networking and campaigning activities on pesticides.



**No Pesticides on My Plate Platform** is established in 2021 and aims to ensure that a perspective that will favour public welfare and the right to life for all living beings and future generations; that will protect the ecosystem; that is long-term and needs-focused considering climate change; that prioritizes locality and self-sufficiency; that doesn't ignore ancient knowledge and practices; prevails in all activities for making the food on our table and non-food agricultural products safe, healthy, available and accessible.



**Civil Society Dialogue Programme** is a programme bringing together civil society organisations from Turkey and the EU around common topics, to exchange knowledge and experience, and to build a sustained conversation between the organisations. The Programme launched in 2008 is financed by the European Union and The Directorate for EU Affairs is the responsible institution for the technical implementation of the programme, while the Central Finance and Contracts Unit is the contracting authority.

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#### Apologies

*We are sorry about the energy, paper, chemicals used in paper making, ink, computers and money which is an artificial tool for exchange used and spent during the production, design and printing of this publication. We hope to be more beneficial to natural life than what we use with our efforts and prayers.*

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# We Can Be Free from Poisons Around Us

We are slowly being poisoned while relaxing in our garden, enjoying the playground with our children and using the tap water in our homes. Pesticides reach our tables via our food as they are extensively used in agriculture but they are also extensively used in parks, schools, roads, sidewalks, cemeteries, garbage dumps, gardens and university campuses, threatening our health and our natural resources.

Analysis of 96 grass samples taken from 4 schoolyards and 1 farmers market in South Italy's Tirol Region showed 32 different pesticide active ingredients, of which 76% are endocrine system disruptors, are present in the environment.

A study in the USA found out that 28 out of 40 pesticides commonly used in school grounds were possible or probable carcinogenic, 26 were reproductive system disruptors, 26 were causing neurological disorders and 13 were causing birth defects.

According to a report on water quality in Turkey presented during the Climate Change and Water Management Symposium, 33 out of 49 micro-pollutants detected in our waters were pesticides.

Scientific communities are increasingly drawing attention to the harmful effects of these poisons and new research is being published on their use in cities.

## Steps Towards Pesticide-Free Towns

Although pesticides are primarily associated with agriculture, these chemical substances are used more and more in our habitats due to increasing urbanization. Biocidal products licensed by the Turkish Ministry of Health and consisting of the same active ingredients with pesticides, are becoming widespread; thus, concerns about the harmful effects of these chemicals on human health, water resources and biological diversity are also becoming mainstream issues.

Many local authorities in Europe and in the world, have taken important steps towards going pesticide-free for their citizens. Among them are those which have successfully become completely pesticide-free. The European Commission, within the scope of the Biodiversity Strategy and influenced by the pioneering pesticide-free towns, is aiming to ban all pesticide applications in sensitive urban green areas by 2030. These achievements towards the right to live in a healthy environment, especially regarding the exposure of children to harmful pesticides, is mainly a result of combined lobbying, campaigning and advocacy efforts of concerned citizens and non-governmental organizations such as No Pesticides on My Plate Platform.

## What should we do?

Just like agricultural pesticides which poison our air, water and earth, biocidal products with same active substances harm our endocrine systems, reproductive systems, cause various types of cancer, chromosomal abnormalities, developmental disorders in children, as well as triggering biodiversity loss by harming bees and other animals, and damaging ecosystems. As citizens, we should demand from our municipalities a transition from biocidal product use to non-poisonous alternatives, meaning a determined step 'Towards Pesticide-Free Towns', urge decision-makers and

## Definitions

**Pests** include all living beings that cause unwanted or harmful effects on humans, human activities, products used or produced by humans, animals and the environment. Pests causing public health concerns include insects such as mosquitoes, house flies, cockroaches and fleas; other arthropods such as mites, scorpions, centipedes and ticks as well as animals such as mice and snakes; weeds; microorganisms such as bacteria and fungi causing diseases in humans and pets or damaging buildings and properties by molding and degradation. (Turkish General Directorate of Public Health, 2017)

**Vektors** can be grouped as organisms causing public health threats by biting or stinging in order to suck blood, by causing allergies and itching, by injecting venom, unwantedly sharing or contaminating our food, and causing nuisance just by their sight or sounds.

Organisms such as mosquitoes, house flies, midges, fleas, cockroaches, ticks and mice that transfer disease causing microorganisms (pathogens) such as bacteria, fungi and viruses to humans and other animals (hosts) which cause diseases like malaria, typhus and cholera are called **vectors**, and are the primary public health concerns. (TR Public Health Organization, 2017)

**Biocide** is a substance that kills a biological organism, but biocidal products are described as "substances, through their active ingredient or ingredients that cause a chemical or biological effect on microorganisms such as bacteria, virus and

fungi, insects such as cockroaches, ticks, flies and mosquitoes, rodents such as mice and rats, which are considered pests.” These chemicals are expected to control pests by affecting only the target organism (selective), to decompose into ecologically acceptable by-products in an appropriate period of time, to persist in the application area and to have a non-accumulative potential in the environment. Unfortunately, however, there are currently no biocidal products in the market that have all these properties. (Geyikci, 1999)

As of September 2021, the list of registered biocidal products published by the Turkish Ministry of Health – Public Health General Directorate consist of 2.739 products, including disinfectants.

**Pesticides** are chemical substances and microorganisms used against insects, weeds, fungi and similar pests to prevent damage in industrially produced crops. Pesticides are deadly poisons: the suffix ‘-icide’ means ‘anything that kills something or someone or the act of killing’. For example, insecticides are chemicals that are used to kill insects. But these poisons do not kill only target organisms; more than 98% of sprayed pesticides and 95% of herbicides contaminate non-target organisms by drifting in air and into water and soil even where they are not directly applied.

ministries to take necessary action, support the civil movement and follow campaigns.

Transition towards pesticide-free towns is not limited to municipal spaces, so we should carry out informative activities, organize meetings and forums aimed at all stakeholders including the buildings or the compounds that we live in, in businesses, schools, university campuses, sports clubs and all other private areas that we frequently use.

Transition is only possible through participation as well as creation and dissemination of successful examples. So, how can we be pioneering citizens? What can we do in our homes and gardens? With this guidebook, we aim to help you to become pesticide-free.

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## Rodents

Physical control is based on removing rodent feeding and breeding areas. Eliminating their living spaces and especially preventing their access to buildings in the first place is an important part of control. It is critical to seal cracks and holes where rodents can access a building or a facility (such as installing wire mesh on storm drains and sewage manholes, filling cracks and crevices with polyurethane foam) or else they can nest again in places where control measures are taken.

### Eliminate Access to Structures

The most important preventive measure is making it difficult for rodents to get into your home. Seal any cracks, crevices or voids that are large enough to stick a pencil through. Mice can squeeze through a hole that small, and both rats and mice can gnaw on a small hole to make it larger.

- Seal large holes with sheet metal flashing, 0.6 mm hardware cloth, plaster, or mortar.
- Seal smaller holes with caulk, spackle, or cement.
- Use knitted copper mesh (scouring pads) to stuff into large gaps. (Steel wool will rust and eventually allow rodents access again.)
- Seal gaps around pipes and wires where they enter the structure or where they pierce an interior wall.
- Make sure that windows and doors fit properly. Use weather stripping and door sweeps if necessary, or repair thresholds and windowsills.
- Keep outside doors (or screen doors) closed.
- Keep tree and shrub branches 1 to 2 m away from buildings to prevent roof rats from using them as a walkway to the upper parts of the structure.

### Store Food Properly

- Keep food in the refrigerator or pest-resistant containers made of glass, metal, or heavy plastic with tight-fitting lids. Do not leave food out overnight.
- Store dry pet food, birdseed, and grass seed in pest-resistant containers.
- Remove and clean pet dishes after pets have eaten. Do not leave pet food out overnight, especially outdoors.

## Keep Things Clean

- Sweep or wipe up food spills promptly.
- Clean food preparation and eating areas daily.
- Promptly wash dishes and utensils, or store them in the dishwasher with the door closed.
- Empty garbage regularly. Store it outside in rodent-proof garbage containers with the lids closed tightly.
- Rinse recyclables before storing.
- Pick up pet droppings outside with a plastic bag and place in trash.
- Pick up fallen fruit and nuts, and be sure to harvest all fruit and nuts as they ripen.
- Fallen seed from bird feeders is a prime source of food for rodents. Clean seed up daily at the end of the day or remove bird feeders.

## Reduce Access to Water

- Fix leaking faucets and pipes, including those in your irrigation system.
- Improve drainage in areas where standing water collects.
- Remove tires stored outdoors or drill holes in them so water can drain.
- Keep food preparation areas and sinks dry when not in use, especially overnight.

## Reduce Hiding and Nesting Spaces

- Reduce clutter as it provides great hiding space and runways.
- Store potential nesting materials, such as shredded paper, cotton or polyester batting, foam rubber, insulation, rags, string, etc. in pest-resistant containers.
- Store firewood and lumber at least 45 cm above the ground and 45 cm away from all structures.
- Keep hedges, vines, grass, ground covering plants, and weeds at least 45 cm away from structures to decrease cover for rodent runways and prevent hidden access to buildings, both at ground level and at the roof.
- Keep weeds and grass mowed to the height of a few inches.
- Eliminate ivy; not only is it an invasive weed, it also provides excellent shelter and food for rats. If you cannot remove it, shear the ivy close to the ground.
- Thin dense bushes and hedges and remove heavy vine growth.
- Remove excessive mulch as it can hide burrows and runways.
- Compost in rodent-proof compost bins and never put meat in the compost.
- Remove woodpiles, rock piles, and construction or other debris piles.

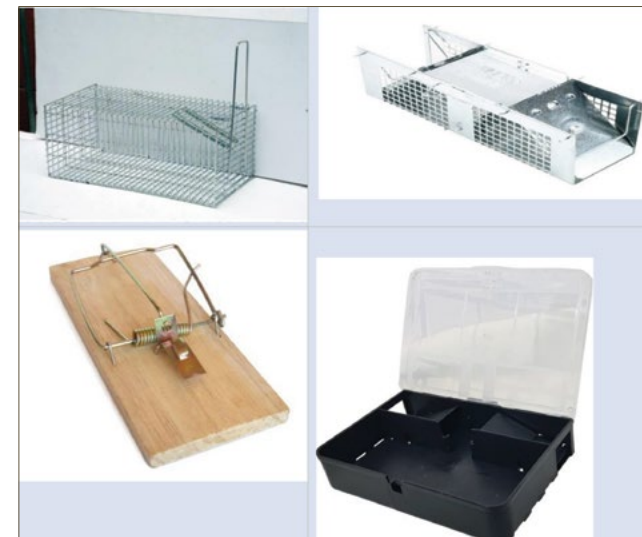
## Traps

After the above mentioned measures are taken, various traps can be used for mechanical control.

- Traps are placed where signs for rodents (such as gnawing and excrements) are noticed. Baits can be cheese or bread with peanut butter. There are two different types of traps; ones that catch the rodent alive and the others that kill them. Bodies of killed or dead animals should not be randomly disposed of; they should be buried in holes at least 0.5 m. deep. It is advisable to place traps in wooden or metal stations in order to prevent contact with children and pets.
- Sticky plates are also used in rodent control; they contain polybutene. The sticky plate, sometimes with food bait in the middle, is placed where the rodents go about and they are eliminated when stuck on it.

There are new devices with sensors on traps and sticky plates, which send notifications when the rodent is caught, or devices with specially designed motion sensors for rodent control, which send notifications when rodent motion is detected.

Some examples of rodent traps (Ankara University, 2021)



1- The wooden variety of the cage-type trap used in mechanical control is also suitable for catching rats.

2- The Sherman type trap used for catching alive rodents is suitable for house mice and field mice.

3- Snap traps are used for killing any type of rodents. Traps made out of tin are common in Turkey.

4- Plastic trap for catching rodents alive.

- Sonic devices: Sonic devices with 32-62 kHz frequency range (32.000 – 62.000 Hz) are used for repelling rodents from indoor areas. Human ear can hear frequencies between 20 – 20.000 Hz, so sonic traps are not audible for humans. This method is limited, can be used indoors only and has blind spots. They can disturb other domestic animals in the building and rodents may get accustomed to the sounds generated by the device. Long-term efficiency is still debated in the literature.

- Electric shock: These relatively recent devices are similar to bait trap boxes, but installed with a device that electrocutes and kills the rodent when caught. These are effective against house mice and may cause some safety issues. (Ankara University, 2021)

## Rodent Control

### Bicarb Mixture

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#### Ingredients:

125 ml Flour  
125 ml Sugar  
125 ml Bicarbonate of soda

#### Equipment:

Cup  
Jar lids  
Mixing stick  
Plastic bag

#### Purpose:

This mixture is to help kill rats and mice. The sugar will attract the rats and the bicarbonate of soda will kill them.

You can make your own mixture to control rodents by following these steps:



#### STEP 1

Mix 125 ml flour with 125 ml sugar and 125 ml bicarbonate of soda.



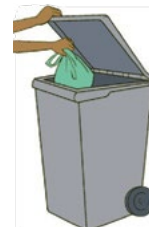
#### STEP 2

Half fill some jars or plastic lids with the mixture.



#### STEP 3

Place the lids with the mixture wherever you have seen droppings or behind cupboards. The rodents often return to these spots. Make sure children and animals cannot reach or eat the mixture.



#### STEP 4

Collect the dead rodents, put them in plastic bags and place the bags in a rubbish bin with a lid.

## Ticks

Ticks are not insects. They are actually arthropods that are more closely related to mites and spiders. Ticks require host animals in order to survive and reproduce.

### Avoid Tick-infested Areas

One simple way to avoid tick problems is to avoid areas where they are common. Ticks are most common in woody or overgrown areas where the ground is covered with brush, thick weeds, or high grass. Ticks need to be protected from the harsh drying effects of the sun and wind, and these areas not only provide that protection, but they are also areas in which ticks' hosts, such as mice, live.

One way that you can tell if an area is infested with ticks is by flagging. Flagging is done by dragging a white cloth over dense, low-level vegetation. Ticks that are looking for passing hosts will grab onto the cloth thinking that it is a host.

### Modify Your Landscape

You can create tick-free spaces by modifying your landscape. If there is a tick problem in the area, you should consider making these changes to your garden:

- Keeping the lawn mowed to a height of 7.5 cm or less. This lowers the humidity at ground level, making it difficult for ticks to survive.
- Getting rid of brush, weeds, leaf litter and other debris which can attract ticks and their hosts.
- If a garden is bordered by a wooded area, raking up leaf litter and cutting down underbrush for one-two meters into the woods.
- Eliminating densely planted beds near the house, living spaces or frequently visited areas.
- Keeping picnic tables, lawn furniture and children's play areas as far away as possible from woods, shrubs and undergrowth.
- Using woodchips or gravel to create a barrier between wooded areas where ticks are common and the lawn.
- Putting up warning signs in known areas with tick populations and ensuring citizens to visit these areas with proper clothing. (McClanahan, 2005)

### Dress Appropriately – Personal Protection

Besides landscape management measures, it is also important to dress appropriately when entering areas that are infested with ticks. Wearing light colors to help easily spot ticks on clothes.



- Wear clothes that fit tightly around your wrists and ankles.
- Tuck your shirt into pants and the hems of your pants into your socks.
- Use a rubber band or tape the area to seal where your socks and pants meet. Wear a hat and long-sleeved shirts.
- As ticks often wait on tall grass and vegetation along trails, try to stay in the middle of trails in order to avoid brushing up against the vegetation.

### Checking for Ticks

Ticks can be hard to notice, so you should perform tick checks on yourself, your kids, and your pets after you have been in tick habitat. You should examine your entire body, especially in areas in which ticks are most commonly found: under your arms, in and behind your ears, inside your belly button, on the back of your knees, in and around your hair, between your legs, and around your waist. It's always a good idea to take a shower as well. Drying your clothes in a hot dryer kills ticks.

If you find a tick, it needs to be removed right away. Follow proper tick removal guidelines or visit a professional health care facility.

### Animal-proof Your House and Yard

If you don't encourage animals to come close to your house, you will be less likely to get a tick bite. Move woodpiles, bird feeders, and birdbaths as far from your home as possible. Mice and chipmunks are hosts for ticks. They hide and nest in woodpiles, and eat spilled food from birdfeeders.

### Pets and Ticks

Pets that go outside are likely to return home with ticks. If you have pets in an area where ticks are common, you should groom them when they come in from outside.

### Repellents

Pesticides are often recommended to repel ticks. A commonly recommended repellent, DEET, causes a number of adverse effects to the nervous system.

Repellents for pets: Ticks hate vinegar smell and taste. You can make a tick repellent by mixing 250 ml water with 500 ml vinegar in a spray bottle. Alternatives such as eucalyptus leaves and neem oil are also useful for repelling ticks.

## Cockroaches

### Restricting food and water sources: Sanitation

Sanitation and hygiene are fundamental elements of cockroach management. Keeping food in cupboards and in tightly closed containers, collecting waste in closed containers without keeping it outside for long, keeping basements and ground floors of buildings dry, drainage, closing outlets of sewage pipes and drinking water pipes, restricting accessible food and water sources are important steps for non-chemical control. (Cochrah, 1999)

Cockroaches like dark, crowded spaces, so control efforts should include wall spaces, spaces in cabinets and drawer spaces, and under the sinks.

Cockroaches do not like peppermint. Mix peppermint leaves or oil with white vinegar and then use regularly to wipe counters and cupboards clean.

### Eliminating Hiding Places

Cockroaches hide next to water heaters, cracks in cupboards, in wood stoves, low spaces beneath furniture, exterior vegetation and many other dark places during the day. At night, they come out to find food. Part of an efficient management strategy is to limit their access to hiding spots and living spaces.

### Non-Pesticide Traps

These traps attract cockroaches to a specific spot and then catch or kill them there. Various food materials, pheromones and chemicals are used as bait. The actual trap can be a mechanism or a sticky substance.

Sticky traps can be used to catch any cockroach species and are usually effective for 4-6 weeks.

It is best to use cardboard traps in order not to cause pollution. Insect poisons are banned in some countries due to the risks so non-pesticide traps are used in places such as hospitals, newborn care facilities, zoos, schools, etc. (Bajomi, Tomcsik & Nagy, 1996)

Ready-to-use traps are safe for children and pets. These traps should be placed in spots where cockroaches go about. They are more efficient if left in places where some food and food waste is present. The traps should be checked and renewed frequently if the infestation is big. (Cochrah, 1999)

### Cockroach Control Alternatives *(Keep away from children and pets)*

#### Sugar and Bicarb Mix

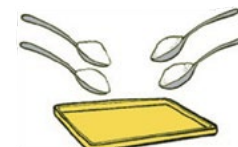
##### Ingredients:

2 teaspoons of icing sugar  
2 teaspoons Bicarbonate of soda

##### Equipment:

Teaspoon  
Plastic lid  
Plastic bag

You can make your own mixture to control cockroaches by following these steps:



#### STEP 1

Mix 2 teaspoons of icing sugar with 2 teaspoons of bicarbonate of soda on a flat plastic lid.



#### STEP 2

Place the plastic lid with the mixture behind appliances, cupboards or anywhere cockroaches live. Make sure children and animals cannot reach or eat it.



#### STEP 3

Leave until mixture is hard and then replace. Put the hard mixture, dead cockroaches, and plastic lid into a plastic bag and throw it away in a rubbish bin with a lid.

## Peanut Butter Trap

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### Ingredients:

Peanut Butter

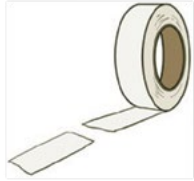
### Equipment:

Sellotape or sticky tape

Matchbox

Plastic bag

You can make this trap to control cockroaches by following these steps:



### STEP 1

Cut small strips of Sellotape or any other very sticky tape.



### STEP 2

Place the tape, with one teaspoon of peanut butter on the sticky side, onto a plastic lid. Place anywhere cockroaches have been seen. Replace when the tape is full of cockroaches.



### STEP 3

Put the tape with the dead cockroaches into a plastic bag and throw it away in a rubbish bin with a lid.

## Gel Baits

Gel baits are applied with a bait gun or a syringe in places such as cracks, where cockroaches tend to wander. They can be used both outdoors and indoors. For products which contain relatively more natural substances such as boric acid, licensed safety-tested products should be preferred. (Sutherland, Choe & Rust, 2019)

## Repellents

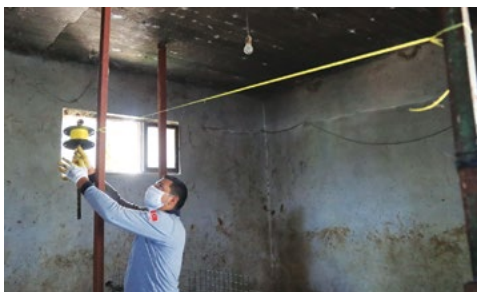
Repellents are increasingly used for cockroach control indoors and manage to keep these insects away from food sources. Essential oils such as peppermint and eucalyptus are also known to be effective as cockroach repellents, but synthetic products that are easier to standardize are usually preferred. There are many plants and plant derivatives with repellent properties; however, just a few compounds have been commercialized. In some cases, it is expensive or inefficient to extract the pure bioactive compound, preventing them from having a share in the market. This is why most commercial arthropod repellent active substances are isolated from a plant or another natural source and then reproduced synthetically. (Dinler & Yavuz, 2010)

## House flies

Flies inside a building almost always enter from the outside. Therefore, barriers preventing flies' access to the building are the first line of defense. Cracks around windows and doors where flies may enter should be sealed. Well-fitted screens will also limit their access to buildings. Outdoors, regular removal (at least once a week) and disposal of organic waste, including dog feces, rotting fruit, and kitchen waste will reduce the attractiveness of the area to adult flies and limit their breeding sites. Garbage should not be allowed to accumulate and should be placed in plastic bags and held in containers with tight-fitting lids where feasible. Garbage should also be placed as far from a building entrance as possible. The general causes of house fly problems are the inadequacy of hygiene conditions and measures to prevent the entry of flies.

Although sticky flypaper or ribbons are effective at eliminating a small number of flies in relatively confined areas, they are not effective enough to manage heavy infestations or to provide control in an outdoor setting. Inverted cone traps containing fly food attractants, which are available for purchase, are effective when there is no nearby garbage or animal waste. The bait used in these inverted cone traps are quite foul smelling, so the traps should be placed at some distance from the living area.

Ultraviolet light fly traps can be effective when used indoors where they are not competing with daytime sunlight. Old school fly swatter is an appropriate tool to manage small numbers of flies. Do not use fly swatters near food preparation areas because they may result in contaminating food with insect body parts. Similarly, never use a "bug zapper" to kill flies near food preparation areas, as the insect body often explodes upon touching the wires and insect body parts can be propelled over several feet from the device.



*Pamukkale Municipality controls black flies at barns by using non-chemical sticky threads.*

### Physical Management – Sanitation

Identifying risk areas in urban contexts such as slaughter houses, cattle barns, manure houses, open toilets, septic tanks and garbage storage facilities of restaurants, factories and business centers, landfills, as well as eliminating potential breeding spots, organizing training and awareness raising activities for businesses, financing, identifying and improving risk areas within municipality boundaries are all parts of sanitation activities.

Accumulated manure on barn floors, humid edges and corners of walls and manure ducts should be removed regularly and washed frequently or dried by sprinkling lime powder.

Also, it is a good idea to kill fly larvae by hot composting manure heaps, because compost is not a favorable environment for larvae. Manure kept in pits should be covered with plastic tarps, hay, soil, etc. This prevents flies from physically contacting the manure and the fermentation process causes the heap to heat up to 50oC, killing larvae.

Manure should be collected on a concrete floor with surrounding water ditches to prevent larvae from escaping or dried by spreading. If the manure is kept as slurry in liquid tanks, it is critical to prevent holms from forming by accumulation of solid manure particles, which are very favorable habitats for larvae to breed. (Kaya & Uzmay, 1995)

### Garbage collection practices in city centers

Another good breeding place for house flies are garbage collection areas. Using plastic garbage bin liners, taking out and collecting garbage bags during night time regularly, using containers with tight fitting lids in suitable spots, etc. will reduce breeding and spreading of flies. Burying, covering and transporting municipal waste quickly and appropriately are also included in house fly control measures.

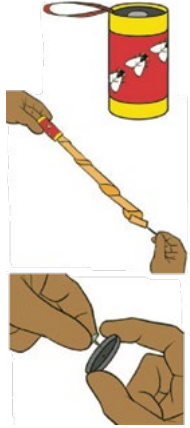
## House Fly Management

### Sticky Traps

You can make your own traps to control flies by following these steps:

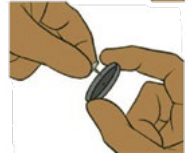
#### Equipment:

Fly tape bought at a shop  
Plastic bag



#### STEP 1

Open the package and take the tape out.



#### STEP 2

Grasp the cord and pull slowly turning the tube in a counter-clockwise (twirling) motion. The cap will pop out.



#### STEP 3

Remove the thumbtack (pin) from the top of cap and use it to hang up the tape trap. Throw the cap away.



#### STEP 4

Remove the tape completely from the tube or let the tube dangle from the tape. Hang the tape with the thumbtack (pin) or cord in a high place in the home to attract flies.

#### STEP 5

When the tape is full of flies, remove it and place it in a plastic bag. Throw away the plastic bag in a rubbish bin with a lid. Be careful because the tape is sticky. Wash your hands well after handling the tape.

### Vinegar Mixture

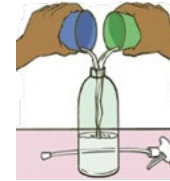
This vinegar-water mixture helps keep flies away. It works best if used alongside repellents such as citrus peels (skins of citrus fruits hanging on doors and windows), essential oils or planting citronella, malvarosa, marigold, mint or lemongrass around the house.

#### Ingredients:

250 ml Vinegar (any type)  
250 ml Su

#### Equipment:

Spray bottle  
Damp paper towel  
Plastic bag



#### STEP 1

Mix one (1) cup of vinegar with one (1) cup of water and place in a spray bottle.



#### STEP 2

Shake the bottle well before use. Spray the mixture around windowsills and other surfaces where you see flies resting.



#### STEP 3

Wipe up the dead flies using a damp paper towel, place the flies and cloth in a plastic bag and put it in a rubbish bin with a lid.

## Bottle Trap

This trap will help catch flies which will starve and die. You can make your own trap to control flies by following these steps:

### Ingredients:

Left-over food like rotting potatoes or meat

### Equipment:

Empty 2 L plastic bottle

Knife

Duct tape

String

Plastic bag



#### STEP 1

Cut an empty, plastic, 2 L drink-bottle in two, with a knife. Make the bottom half larger than the top half.



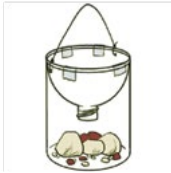
#### STEP 2

Place a few pieces of rotting food - such as potatoes or old meat - in the bottom half of the bottle.



#### STEP 3

Remove the cap from the top of the bottle. Turn the top upside down and place the open end of the bottle inside the bottom half of the bottle.



#### STEP 4

Tape the two halves of the bottle together so they stay secure. Make two holes on either side of the bottle and hang the trap outside with a piece of string.



#### STEP 5

Tuzak dolduğunda veya dayanılamayacak kadar kötü koktuğunda bir naylon torbaya koyun ve kapaklı bir çöp kovasına atın.

**Caution:** This trap could attract more flies. You should only use this trap when you have a lot of flies.



## Mosquitoes

The primary focus of backyard mosquito management should be the elimination of standing water on your property. Seek out and drain standing water at least once per week in order to interrupt the breeding cycle. Mosquitoes can breed in drops of water the size of a dime. Be sure to check out-of-reach and obscure areas such as gutters, tires, tarps and drains. Eliminate standing water in containers around home, including water in cans, plastic containers, potted plant saucers, buckets, garbage cans, barrels, wheelbarrows, and any other container that holds water for more than a few days. Empty the water and then either: invert, cover, punch drainage holes in, or dispose of these containers. Don't dump yard waste into street gutters, storm drains, or creeks. It can impede the flow of water, allowing mosquitoes to breed. The decaying organic matter then provides food for dense numbers of growing mosquito larvae. Fill holes or depressions in trees with sand, or drain after rainfall. Cutting and trimming overgrown vegetation takes away significant mosquito breeding grounds.

### Monitoring and record-keeping

Check ponds and other sources of water for signs of mosquito larvae. Eggs can be laid either one at a time or in rafts and float on the surface of the water. Larvae live in the water and come to the surface to breathe.

### Non-chemical and mechanical controls

- Seal cracks and crevices
- Repair holes
- Create barriers
- Use mesh screens
- Remove water sources: check drains, faucets and pipes
- Remove standing water
- Use least-toxic repellents: picaridin\* oil, lemon eucalyptus oil or other essential oils. Reapply often. Geranium essential oils are extracted from geranium or pelargonium plants.

\* Potential concerns about picaridin include its novelty. Not enough trial time has passed to accurately assess its long-term health impacts (if any).

- Sit near a fan when outdoors. Mosquitoes can only fly about 1.5 to 2.5 km per hour - so they sure don't like flying to 15 km wind! Use an oscillating fan for the best results.
- Screen yourself in. Screened in porches or outdoor pop-ups are a good way to keep mosquitoes out while you enjoy the nice summer weather.
- Burn citronella candles. While not the most effective means to repel mosquitoes, outdoor citronella candles can play a role in keeping mosquitoes out of your immediate vicinity when there is no wind.
- The Mosquito Magnet is a machine much like a gas grill which burns propane gas that sends out a plume of carbon dioxide. The carbon dioxide attracts mosquitoes, which are then sucked in and killed. One magnet can control adult mosquitoes over an acre of land, though different levels of success have been reported.
- Wristbands treated with insect repellent have been shown to be ineffective since repellents protect only a few centimeters from the site of application. Ultrasonic devices are also ineffective.
- Don't use electric bug zappers because they kill far more beneficial and neutral insects than mosquitoes.

### Biological controls

Stock closed, ornamental ponds with mosquito eating fish. Nurture natural mosquito predators such as birds and dragonflies, beetles, frogs and snails. Do not forget that pesticide use adversely impacts these beneficial species.

Keep mosquito repellent plants in your garden, yard or pots in your house. These include lemon thyme, plants with citrus scent (e.g. lemon grass, citronella), lavender, mint, marigold and rosemary. Rub these plants regularly to release their scent.

### Use least toxic chemical options as a last resort

Control mosquitoes before they hatch by using least-toxic larvicides like *Bacillus thuringiensis israelensis* (Bti). These products are biological larvicides that are safe for birdbaths, rain barrels, ponds, ditches, tree holes, roof gutters, unused swimming pools or wherever water collects.

Horticultural oils (vegetable based) are effective in killing larvae in water and sinking egg rafts on the surface. However, they also can kill non-target organisms including some mosquito predators that breathe from the surface.

## Mosquito Management

### Yeast Trap

This trap helps to kill mosquitoes. You can make your own trap to control mosquitoes by following these steps:

#### Ingredients:

- 125 ml Brown sugar
- 125 ml Boiling water
- 1 teaspoon Dry Yeast

#### Equipment:

- Plastic 1 L or 2 L bottle
- Duct tape
- Scissors



#### STEP 1

Cut a plastic one (1) or two (2) liter bottle in half, a little more than halfway from the bottom.



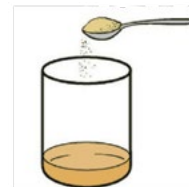
#### STEP 2

Dissolve 15 ml of brown sugar in 125 ml of boiling water to create a syrup mixture. Let the syrup cool.



#### STEP 3

Pour the cooled syrup into the bottom of the plastic bottle.



#### STEP 4

Sprinkle one teaspoon of dry yeast on the top of the syrup so that the yeast floats on top. DO NOT STIR.



#### STEP 5

Remove the cap from the top of the bottle. Turn the top upside down and place the open end of the bottle inside the bottom half of the bottle. Hold the two pieces together with tape. Ensure the top of the bottle is above the water and not in it. Make two holes in the bottle and hang up trap outside with a string.



#### STEP 6

Hang the trap where mosquitoes have been a problem. Empty and refill the syrup mixture every two weeks or when bubbles are no longer forming. Hang up and place out of reach of children and pets.

## Neem and Water Repellent

This mixture is used to keep mosquitoes away. Place out of reach of children and pets. You can make your own mosquito repellent by following these steps:

### Ingredients:

1 teaspoon Neem oil  
1 teaspoon Water

### Equipment:

Spray bottle



#### STEP 1

Mix one teaspoon of neem oil with one teaspoon of water.

#### STEP 2

Place the solution into a spray bottle and label the bottle with "Neem Mixture: DO NOT INGEST!"



#### STEP 3

Spray the solution on furniture, floors, and anywhere where there are mosquitoes.



#### STEP 4

Wipe up the dead mosquitoes with a damp cloth and throw them away in a rubbish bin with a lid.

**Caution:** *Neem oil can cause irritation to the skin and eyes. Neem oil should not be ingested and should be kept out of reach of children and pets. Do not use neem oil when pregnant.*

## Fleas

### Monitoring and record-keeping

Detection can be as simple as seeing fleas or noticing bites around the ankles of people in the building. Flea dirt, the adult flea feces that dries and falls off the host to serve as food for larvae, may also be visible.

Monitor in and around the cages of pets, the pets themselves for signs of fleas, and places where animals may find shelter, such as basements, crawl spaces, attics, eaves, roof top structures, and secluded shrubbery near buildings.

Traps can also be used to detect flea populations. Flea socks are knee-high, white flannel booties that fit over the shoes and lower pant legs and can be considered as a fashion statement. When walking through flea-infested areas, fleas will jump onto the flannel and become tangled in the nap. You can easily see and count them to determine the degree of infestation.

Long, white athletic socks worn over shoes and pant legs also work, so does wide strips of sticky-backed paper wrapped sticky-side-out around the lower legs.

Light Traps are compact traps composed of a small electric light and a sheet of sticky paper. Adult cat fleas may be attracted to the warmth and light of the trap, hop over, and get stuck on the paper. Fleas are more sensitive to green light, and are more attracted to light traps if the light is turned off for 10 seconds every 5 or 10 minutes. The light trap should be checked once a week.

If no fleas are caught by the second week, move the trap to another location or remove it. If only a few fleas are caught, the infestation is very small and can probably be controlled by the traps alone, and the traps should be left in place until no additional fleas have been caught for a week. If 20 or more fleas are caught in a week, there is probably a more serious infestation, and it is time to find the source.

## Non-chemical and mechanical controls

- Seal cracks and crevices
- Repair holes
- Remove water source: check drains, faucets and pipes
- Remove standing water
- Vacuum
- Steam treatment
- Heat
- Sanitation — use soap and water to clean surfaces
- Restrict pets to a single bed, and wash this frequently. Also try sprinkling the bed with pine needles, rosemary, fennel or rye.
- Groom pets with a flea comb daily. After each stroke, check for fleas caught in the comb, picking off and dumping any in soapy water. Pick off any fleas from the comb and dump into soapy water.
- Give pets vitamin B1, shown to reduce flea bite frequency. A small dose of brewer's yeast should do. A better option might be to visit the veterinarian for a B-complex vitamin supplement.
- The same light traps mentioned above are effective for flea control, using either sticky paper or a small tub of soapy water to catch attracted fleas.

## Use least toxic chemical options as a last resort

Boric acid worked into the nap of carpet can be used to control fleas. It works as a “digestive poison” for fleas and will remain viable for up to a year. Exercise caution when using products containing boric acid, and do not use it in areas where children or pets will come in direct contact with the chemical.

D-limonene and linalool are citrus extracts that have proven effective for flea control. Products containing d-limonene kill larval and adult fleas, while those containing both ingredients kill eggs as well. There are EPA-registered shampoos containing these ingredients, but read the label carefully, as some are too strong for cats or young animals. Limonene is listed as a volatile organic compound (VOC) by the EPA, which can be associated with irritation, odors and other health and comfort concerns. Those with existing sensitivities should be extremely careful when using a product containing limonene, or consider using another alternative.

## Flea Control

### Eucalyptus/Lemon Repellent

These mixtures help keep fleas away. You can make your own mixture to control fleas by following these steps:

#### Ingredients:

- 2 lemons or 20 Eucalyptus leaves
- 1 L Water

#### Equipment:

- Pot
- Stove to boil water
- Spray bottle or sponge



#### STEP 1

Peel two large lemons.



#### STEP 2

Place the lemon peels or 20 fresh eucalyptus leaves in a pot with one liter of water. Boil the leaves in the water for 10 minutes and let it cool down.



#### STEP 3

Remove the peels/leaves from the water and put the mixture in a spray bottle or in a wide-open container with a sponge.



#### STEP 4

Spray the cool mixture onto pets and places where they sleep. The cool mixture can also be applied with a sponge.

## Salt Repellent

This salt mixture will help you keep fleas away. You can make your own mixture to control fleas by following these steps:

### Ingredients:

Fine salt  
Water

### Equipment:

Brush and  
dustpan



#### STEP 1

Place a thick layer of salt where fleas are found in the home such as under tables, on the couch cushions, carpets, rugs or outside.



#### STEP 2

Leave the salt overnight, or at least for 8 hours.



#### STEP 3

Sweep up the salt and throw it away in the rubbish.

### For pets:

Make a mixture of one-part salt to 10 parts water and put in a container to wash your pet in. [For large animals, pour over them.] Soak the pet in the salty water but do not let any salt water get into their eyes or ears. Rinse the pet off with clean, warm water, and then cool water.



### For pets with lots of fleas...

Gently rub dry salt into the pet's fur and leave it for two (2) hours. Brush the pet well to remove all the salt and then rinse their fur well with warm water. If the fleas come back again, repeat the salt rub and rinsing after 10 days.



## Ants

The best way to control ants is through prevention! There are several ways to stop ants from becoming a problem.

- See if it is possible to plug the places where ants are entering the house (e.g. fix the holes, use steel wool)
- Use lemon juice to wipe counters, inside cupboards and potential holes that ants are entering through.
- Sprinkle window sills or floor edges with cinnamon, cayenne pepper or chili powder.
- Leave mint leaves or cloves in areas where ants are often found. These will need to be replaced when you can no longer smell them.
- Take a saucer or small plate and pour some water into it. Place a sugar bowl on the saucer (in the water) so ants become trapped on the saucer when they try to get to the sugar.
- Place the legs of beds in cans of water to prevent ants from climbing onto the beds while people are sleeping.
- Ants leave a 'scent trail' so be sure to clean this trail.

## Ant Control

### Vinegar Mixture

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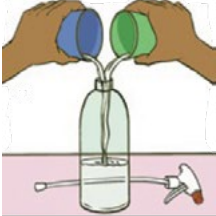
This vinegar mixture is for killing ants and removing their scent trail. You can make your own mixture to control ants by following these steps:

#### Ingredients:

250 ml Vinegar (any type)  
250 ml Water  
Chili powder (peppermint or cinnamon)

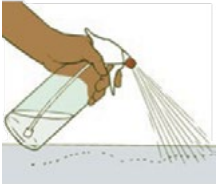
#### Equipment:

Cup (any type)  
Spray bottle  
Damp paper towel



#### STEP 1

Mix 250 ml water with 250 ml vinegar. Chili powder, peppermint or cinnamon can also be added to the mixture for extra strength.



#### STEP 2

Spray the mixture directly on the ants.



#### STEP 3

Wipe up the dead ants using a damp paper towel. Throw the dead ants and the cloth into a rubbish bin with a lid.



#### STEP 4

Also spray the mixture on counters and windows to remove the ant 'scent trail'.

### Bicarb Bait

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This bait is for killing ants. Place out of reach of children and pets. You can make your own mixture to control ants by following these steps:

#### Ingredients:

10 teaspoons Jam or Syrup  
1 teaspoon Bicarbonate of soda

#### Equipment:

Teaspoon  
Damp paper towel  
Plastic lid



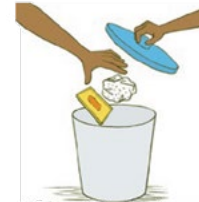
#### STEP 1

Mix ten teaspoons of jam or syrup with one teaspoon of bicarbonate of soda. Mix well.



#### STEP 2

Place a few spoonfuls of the mixture onto a plastic lid and place the lid near where you see ants. Replace the bait often as ants prefer fresh bait.



#### STEP 3

Wipe up the dead ants using a damp paper towel. Throw the dead ants and the cloth into a rubbish bin with a lid.

## Weeds

Herbicides are agricultural poisons used for killing weeds (wild herbaceous plants).

The term 'weed' and its use is actually an indicator of humanity's 'alienation' from nature and what is natural. Except for the invasive species which arrive via trade activities, climate or senseless choices, what we are trying to control are only the native species of a region. And they are only fighting against the conditions that humans are trying to create because of their alienation to nature and the natural. They protect the soil from erosion, enrich the soil with organic matter, as well as fight humanity for biodiversity. We have been living together with these plants for thousands of years; we eat them, use them for curing illnesses, obtain dye from them and feed animals with them, but they also enrich us with their flowers in spring time, feed bees and other beneficial insects, which are now looked down on because they grow in sidewalks or among grass turf. Municipalities, residential compounds and campus managers and gardeners are trying to eliminate these plants by mechanical, thermal and poisonous means which grow in empty plots, sidewalks, walking paths, parks, residential gardens, campuses, etc.

This is why we should ask ourselves first: Should we not live together with these weeds unless they cause life threatening risks (such as railway accidents or allergies)?

### Alternative Methods That Help Us Eliminate Herbicides

#### Planting regimes

An aesthetically pleasing approach can be a useful step for pesticide-free towns. Aesthetic solutions are about using vegetation traditionally labelled as 'weeds' as display plants. Many of these so called 'weeds' are native species, ideally suited to local conditions, and bring benefits for bees and other pollinators. In addition, these plants will often produce beautiful displays of flower and foliage that are able to compete aesthetically with more traditionally accepted ornamental plant varieties.

Many land managers spend significant budgets each year on annual bedding plants. By using perennials and ornamental grasses that do not need replacing every year an equally vibrant display can be achieved, thereby eliminating the costs of replacing bedding plants

annually. This task is becoming easier due to growing public support for native plants and wildflower meadows, both in terms of their biodiversity benefits but also their aesthetics.

#### Mechanical Methods

##### *Hand Weeding*

Perhaps the most old-fashioned way is simple hand-weeding, actually going in and physically removing weeds by hand. Whilst this is not a technique that can be applied easily to road and highway maintenance it can be effectively employed in parks and green spaces or other smaller areas. It doesn't necessarily have to be done by hand - the use of hoes, rakes and weeding hooks can all be employed to make the task easier. This is particularly effective for weeding cracks between paving and along the edges where pavements meet walls.

One area that could really profit from hand weeding is in schools. Children are particularly vulnerable to the effects of pesticides and so there is an urgent need to end the use of herbicides in schools. Combining hand weeding with lessons on biology, botany or food growing could be a great way to get the job done and bring children closer to nature.

##### *Mowing, Hoeing, Plowing*

More mechanized methods are also acceptable alternatives to herbicides. Mowing regularly where required will keep weeds at bay, although it is important to monitor growth and undertake regular work. Such areas are already likely to be mowed as part of general site maintenance so this approach should not incur any extra costs.

A common practice is plowing, but it is important to monitor when the seeds set and plow before this time.

There is a variety of equipment available in Turkey, from tractor mounted models to smaller ones suitable for personal use, aimed at different soil and land conditions; such as weed cutters, rototillers and other similar tools.

## Mulching

Mulching is a widely-known and accepted method for keeping weeds at bay. It reduces weed growth by keeping light from reaching the soil surface and involves using natural materials such as tree bark and wood chips or mulch mats that are available from various retailers. It is also possible to use other materials such as sand. Sand can also be used beneath newly laid paving to deter weeds.



## Thermal Control

### Hot Water or Foam

Plants do not like excess heat; it kills them. With that basic principle in mind, a range of technologies have been developed which use heat to replace herbicides. There is a number of different approaches – steam, hot water and hot water with foam added. All of them work on the principle that temperatures near to boiling degree will kill the cells in the parts of the plant that are above ground surface. The plant itself dies by ‘boiling’. However, the root is not immediately killed as it would be with herbicide application, but with repeated treatments the plant will eventually weaken and die down to its roots.

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