

A Guide to Pest Best Management Practices

Choose a pest and learn about the best management practices and avoid the use of toxic pesticides.

Revision Date: September 13, 2019

Pest	Pest Type	Biological Controls	Non-Chemical and Mechanical Controls	Least Toxic Chemical Option as Last Resort
Annual Bluegrass	Plant	Goats	1) Create a barrier, 2) Flame treatment, 3) Boiling water, 4) Mow law above 3 inches, 5) Aerate soils, 6) Proper watering not excessive, 7) Dethatching, 8) Handpick to root and destroy, for example, enclosing in a trashbag.	1) Horticultural vinegar (Caustic > 11%, Read directions) or try canning white vinegar which is not as harsh, 2) Herbicidal soap. Note: Homemade herbicidal soap consists of: 1/2 gallon of vinegar, 1/2 cup of salt, 2 tablespoon of bio-degradable dish soap.
Ants	Insect	None	1) Seal cracks and crevices, 2) Repair holes, 3) Create barriers, 4) Sticky traps, 5) Remove trash from property, 6) Remove clutter, 7) Vacuum, 8) Boiling water, 9) Remove debris and habitat.	1) Botanical sprays such as cinnamon oil, mint oil, cedar oil, orange oil. Garlic spray can be used as a repellent. 2) Desiccating dust such as diatomaceous earth, 3) Corn meal.
Aphids	Insect	Lady beetles	1) Create a barrier, 2) Sticky traps, 3) Unusually a strong spray of water, 4) Handpick to root and destroy, for example, enclosing in a trashbag..	1) Usually a strong spray of water or soapy water can be a solution. Soapy water spray consist of: 1 heavy tablespoon of bio-degradeable dish soap to 1 quart (1 liter) of water, 2) Insecticidal soaps such as horticultural oils such as neem oil can be toxic to good insects. Note: Homemade insecticidal soap is 1 heavy tablespoon of bio-degradable dish soap to 1 quart (1 liter) of water.
Apple and Pear Scabs	Fungi	None	1) Proper watering, 2) Remove debris and habitat.	1) Several fungicides are available: Fixed copper, Bordeaux mixture, copper soaps, sulfur, mineral or neem oil.
Bagworms	Insect	1) Bacillus Thuringiensis, least toxic bacterium, 2) Nematodes (Steinernema carpocapse).	1) Remove debris and habitat, 2) Handpick to root and destroy, for example, enclosing in a trashbag..	1) Neem oil and insecticidal soaps are effective against young bagworm larvae however, can have adverse affects on other beneficial insects. Note: Homemade insecticidal soap is 1 heavy tablespoon of bio-degradable dish soap to 1 quart (1 liter) of water.
Barberry	Plant	Goats	Handpick to root and destroy, for example, enclosing in a trashbag..	1) Horticultural vinegar (Caustic > 11%, Read directions) or try canning white vinegar which is not as harsh, 2) Herbicidal soap. Note: Homemade herbicidal soap consists of: 1/2 gallon of vinegar, 1/2 cup of salt, 2 tablespoon of bio-degradable dish soap.
Bittersweet-Asiatic	Plant	1) Plants can be eaten by goats, 2) Fruit and seeds can be eaten by rabbits, squirrels, and birds.	Young bittersweet plants can be hand removed for successful control. Cutting stems before seed is formed will prevent seed production, set the plants back, and possibly save desirable vegetation from being killed, but will not kill the bittersweet plants. If proper mulching and planting is done after cutting small bittersweet stems, many of them will not regenerate. Mulching also helps prevent seeds from germinating.	For established stand of bittersweet, painting fresh-cut stems of bittersweet at the correct time with an appropriate organic approved herbicide such as Horticultural vinegar (Caustic > 11%, Read directions) at the correct dosage usually kills plants with one application.
Black Swallowwort	Plant	None. Poisonous to goats.	1) Mow it to the ground after it has begun to develop seed to stop seed dispersal, 2) Handpick to root and destroy, for example, enclosing in a trashbag..	A chemical-resistant gauntlet glove is worn and a short absorbent (cotton) glove is worn over the gauntlet glove, then dipped in a non-synthetic herbicide and wiped on the leaves. This must be repeated several times in a season to be effective because it does not kill roots. The plant "starves" due to repeated leaf loss. In a meadow or dense vegetative cover, the treated plants can then be covered with adjacent vegetation to omit sunlight, aiding in control. In such conditions plants can be repeatedly cut at ground level and covered.
Browntail Moth	Insect	None	1) Clipping the overwintering webs and destroying these webs by either soaking in soapy water or burning them. This control should be undertaken in the winter and very early spring - September to mid-April. 2) Cocoons or caterpillars crawling on buildings can be removed with water from a high pressure hose.	Webs and larvae are generally high up in trees and are difficult for a home owner to effectively control. Seek professional help from an arborist who is a licensed organic pesticide applicator if considering pesticide control. Pesticides should be applied when caterpillars are small and feeding; usually before the end of May. Timing of pesticide treatment is critical, treatment before the end of May will prevent the development of the toxic hairs, treatment after the end of May will result in dead caterpillars and toxic hairs. Undertake control measures as early as possible to reduce the exposure to the irritating caterpillar hairs. Contact a licensed pesticide applicator well before May to plan a control strategy. Note: A licensed pesticide
Chickweed	Plant	Goats	1) Mow lawn above 3 inches, 2) Proper watering, 3) Remove debris and habitat, 4) Handpick to root and destroy, for example, enclosing in a trashbag.	1) Horticultural vinegar (Caustic > 11%, Read directions) or try canning white vinegar which is not as harsh, 2) Herbicidal soap. Note: Homemade herbicidal soap consists of: 1/2 gallon of vinegar, 1/2 cup of salt, 2 tablespoon of bio-degradable dish soap.
Chiggers	Insect	None. Poisonous to goats.	1) Remove water source: check drains, faucets, and pipes, 2) Remove trash from property, 3) Remove clutter, 4) Remove debris and habitat, 5) After being exposed, shower with warm soapy water. 6) Wash clothing in 125F or hotter.	Direct, chemical control of chiggers is not practical.
Chinch bugs	Insect	Bigeyed bugs (Geocoris, sp.)	1) Aerate soil, 2) Proper watering, 3) Dethatching, 4) Proper fertilizing of lawn, 5) Add agricultural limestone when soil PH is below 6.5, 6) Spray soapy water.	1) Insecticidal soap, Note: Homemade insecticidal soap is 1 heavy tablespoon of bio-degradable dish soap to 1 quart (1 liter) of water., 2) Diatomaceous earth. (Be sure to purchase food grade).
Clover	Plant	Goats	Clover is a beneficial perennial even if perceived as a weed. Clover benefits are: 1) It is an alternative to fertilizer. It adds nitrogen into the soil 2) Earthworm abundance increases. 3) It is good source of nectar for bees. However, if clover is still wanting to be removed: 1) Remove debris and habitat, 2) Handpick to root and destroy, for example, enclosing in a trashbag..	Clover is a beneficial perennial if perceived as a weed. Clover benefits are: 1) It is an alternative to fertilizer. It adds nitrogen into the soil 2) Earthworm abundance increases. 3) It is bee food. However, if clover is still wanting to be removed: Horticultural vinegar (Caustic > 11%, Read directions) or try canning white vinegar which is not as harsh.
Crabgrass	Plant	Goats	1) Flame treatment, 2) Mow above 3 inches, 3) Proper watering, 4) Handpick to root and destroy, for example, enclosing in a trashbag..	1) Horticultural vinegar (Caustic > 11%, Read directions) or try canning white vinegar which is not as harsh, 2) Herbicidal soap. Note: Homemade herbicidal soap consists of: 1/2 gallon of vinegar, 1/2 cup of salt, 2 tablespoon of bio-degradable dish soap.

A Guide to Pest Best Management Practices

Choose a pest and learn about the best management practices and avoid the use of toxic pesticides.

Revision Date: September 13, 2019

Pest	Pest Type	Biological Controls	Non-Chemical and Mechanical Controls	Least Toxic Chemical Option as Last Resort
Dandelions	Plant	Goats	Dandelion is a beneficial perennial even if perceived as a weed. Dandelion benefits are: 1) It is edible (if ensured it has no pesticides on it), 2) It is important source of nectar for bees in Spring. However, if dandelions are still wanting to be removed: 1) Create a barrier, 2) flame treatment, 3) boiling water, 4) Mow law above 3 inches, 5) Aerate soils, 6) Proper watering not excessive, 7) Dethatching, 8) Handpick to root and destroy, for example, enclosing in a trashbag..	Dandelion is a beneficial perennial even if perceived as a weed. Dandelion benefits are: 1) It is edible (if ensured it has no pesticides on it), 2) It is important source of nectar for bees in Spring. However, if dandelions are still wanting to be removed: 1) Horticultural vinegar or try canning white vinegar which is not as harsh, 2) Herbicidal soap. Note: Homemade herbicidal soap consists of: 1/2 gallon of vinegar, 1/2 cup of salt, 2 tablespoon of bio-degradeable dish soap.
Deer	Animal	None	1) Repair holes, 2) Create a barrier, 3) Fencing, 4) Mesh screens.	Caution: Most deer chemical repellants should not be allowed on food crops. 1) Deer repellents based on ammonium salts of fatty acids 2) Capsaicin- based animal repellent, 3) Dried blood or animal renderings used as a repellent. Caution: these materials must come only from American cattle to avoid risk of infectious disease.
Emerald Ash Borer	Insect	Encourage biodiversity such as woodpeckers.	1) Remove debris and habitat, 2) Handpick to root and destroy, for example, enclosing in a trashbag..	Azadirachtin- derived from neem oil but can still harm bees.
Fire Ants	Insect	None	1) Flame treatment, 2) Boiling water, 3) Aerate soil, 4) Remove debris and habitat.	Boric acid bathing system
Fleas	Insect	Nematods	1) Seal Cracks and crevices, 2) Repair Holes, 3) Remove water source: Check drains, faucets, and pipes, 4) Remove standing water, 5) Vacuum, 6) Steam treatment, 7) Sanitation- use soap and water to clean surfaces, 8) Restrict pets to as single bed, 9) Groom pet daily with flea comb, 10) Give pet Vitamin B1.	1) Diatomaceous earth, 2) Boric acid, 3) D-limonene and linalool (citrus acids).
Gophers	Animal	Predators such as owls, snakes, cats, dogs, coyotes eat pocket gophers.	1) Create a barrier, 2) Remove burrow and habitat. 3) Trapping.	None
Ground Ivy	Plant	Rust fungus (<i>Puccinia glechomatis</i>)	1) Mow lawn above 3 inches, 2) 1) Aerate soil, 3) Proper watering, 4) Dethatching, 5) Handpick to root and destroy, for example, enclosing in a trashbag..	1) Horticultural vinegar (Caustic > 11%, Read directions) or try canning white vinegar which is not as harsh, 2) Herbicidal soap. Note: Homemade herbicidal soap consists of: 1/2 gallon of vinegar, 1/2 cup of salt, 2 tablespoon of bio-degradeable dish soap.
Grubs	Insect	1) Milky Spore, 2) Nematods, 3) <i>Bacillus Thuringiensis</i>	1) Mow lawn above 3 inches, 2) Aerate soil, 3) Proper watering, 4) Dethatching, 5) Setting mechanical traps..	None
Gypsy Moths	Insect	1) Natural predators such as: birds, spiders, beetles, flies, and wasps, 2) <i>Bacillus Thuringiensis</i>	1) Sticky traps, 2) Handpick to root and destroy, for example, enclosing in a trashbag..	1) Spray egg masses with dormant oils or vegetable based Horticultural oils, or homemade which is vegetable oil, liquid soap and water.
Hemlock Woolly Adelgid	Insect	Proper timing is key to control HWA. 1) <i>Pseudocymnus Tsugae</i> (black lady beetle) 2) <i>Laricobius Nigimus</i> (beetle), 3) Fungi (<i>V. lecanii</i>)	1) Proper watering, 2) Remove debris and habitat.	Horticultural oils and insecticidal soaps.
Honeysuckle	Plant	Goats	Cutting to the ground with a chainsaw, then repeated mowing for several years has been effective. It is relatively shallow-rooted and in some cases can be extricated to provide excellent control. Planting thickly with native clonal shrubs like <i>Cornus racemosa</i> , <i>Physocarpus opulifolius</i> , and <i>Cephalanthus occidentalis</i> , to name a few.	1) Horticultural vinegar (Caustic > 11%, Read directions) or try canning white vinegar which is not as harsh, 2) Herbicidal soap. Note: Homemade herbicidal soap consists of: 1/2 gallon of vinegar, 1/2 cup of salt, 2 tablespoon of bio-degradeable dish soap.
Japanese Knotweed/Knot weed	Plant	Used as animal fodder for cattle, sheep, horses, donkeys, and goats. It is also a good nectar source for the honey bee in the Fall.	1) Remove debris and habitat, 2) Handpick to root and destroy, for example, enclosing in a trashbag., 3) Knotweed prefers moist soils. Thereby, restricting water (from lawn irrigation) and improving drainage can help contain the plants.	1) Horticultural vinegar (Caustic > 11%, Read directions) or try canning white vinegar which is not as harsh, 2) Herbicidal soap. Note: Homemade herbicidal soap consists of: 1/2 gallon of vinegar, 1/2 cup of salt, 2 tablespoon of bio-degradeable dish soap.
Mosquitoes	Insect	1) Natural predators are: bats, birds, dragonflies, beetles, frogs, snails, 2) Stock ornamental ponds with mosquito biting fish such as minnows or bluegills.	1) Seal cracks and crevices, 2) Repair Holes, 3) Create a barrier, 4) Mesh screens, 5) Remove water source: check drains, faucets, and pipes, 6) Remove standing water, 7) Use least toxic repellants such as lemon eucalyptus, rosemary oil, or other essential oils, 8) Sit near a fan when outdoors, 9) Screen yourself in, 10) Burn citronella candle, 11) Mosquito trap.	1) Before hatching, use a least toxic organic larvicides like <i>Bacillus thuringiensis israelensis</i> , 2) Horticultural oils (vegetable based) but can kill some mosquito predators that breath from surface.
Plantains	Plant	Goats	1) Create a barrier, 2) Mow lawn above 3 inches, 3) Aerate soils, 4) Proper watering, 5) Dethatching, 6) Remove debris and habitat, 7) Handpick to root and destroy, for example, enclosing in a trashbag..	1) Horticultural vinegar (Caustic > 11%, Read directions) or try canning white vinegar which is not as harsh, 2) Herbicidal soap. Note: Homemade herbicidal soap consists of: 1/2 gallon of vinegar, 1/2 cup of salt, 2 tablespoon of bio-degradable dish soap
Poison Ivy	Plant	Goats	1) Remove debris and habitat, 2) With protection, Handpick to root and destroy, for example, enclosing in a trashbag..	1) Horticultural vinegar (Caustic > 11%, Read directions) or try canning white vinegar which is not as harsh, 2) Herbicidal soap. Note: Homemade herbicidal soap consists of: 1/2 gallon of vinegar, 1/2 cup of salt, 2 tablespoon of bio-degradable dish soap.
Snails/Slugs	Animal	1) Natural predators such as Ground beetles, snakes, toads, turtles, birds, 2) Domesticated fowl such as ducks, geese, chickens.	1) Create a barrier, 2) Remove debris and habitat, 3) Handpick to root and destroy, for example, enclosing in a trashbag..	1) Table salt, 2) Caffeine concentrations of 1-2%, 3) 1 part household ammonia with 10 parts water sprayed on plant to prevent slug damage, 4) Beer.
Squirrels-Tree	Animal	None	1) Repair holes, 2) Create a barrier, 3) Fencing, 4) Mesh screens like hardware cloth, 5) Remove trash from property, 6) Remove clutter, 7) Remove debris and habitat.	1) Capsaicin- based animal repellent , 2) Cayenne pepper.
Thrips	Insect	Predatory thrips, green lacewings, minute pirate bugs, mites, certain parasitic wasps.	1) Stick traps, 2) Mesh screens, 3) Sanitation - use soap and water to clean surfaces, 4) Remove debris such as pruning and row covers and habitat.	Does not warrant the use of insecticides because by the time it is noticed, the thrips are gone.

A Guide to Pest Best Management Practices

Choose a pest and learn about the best management practices and avoid the use of toxic pesticides.

Revision Date: September 13, 2019

Pest	Pest Type	Biological Controls	Non-Chemical and Mechanical Controls	Least Toxic Chemical Option as Last Resort
Ticks	Insect	Natural predators are opossums and domestic fowl.	1) Place trash in sealed container, 2) Remove clutter, 3) Do not let pet go in tick infested area, 4) Discourage mice, 5) Remove piles of leaves, 6) Clean around bushes and trees, 7) Store wood piles away from house, 8) Keep metal trash containers with lids, 9) Wear light colored clothing, 10) Tuck your pants into your sock, 11) Wear a hat, 12) Use unscented deodorant, soaps and shampoos, 13) Use an herbal repellent.	Lemongrass and cedarwood essential oils.
Tree Boring Caterpillars	Insect	The use of nematodes, tiny parasitic, insect-eating worms, is a non-chemical method proven effective. Use 20-30,000 nematodes per hole. Create a mixture of nematodes and water and place directly in the hole.	Remove debris and habitat.	If the opening of the tree is unobstructed, blow boric acid, diatomaceous earth, or silica aerogal into it.
Wasps & Yellowjackets	Insect	Skunks, raccoons, and badgers prey upon the nest for honey.	1) Seal cracks and crevices, 2) Repair holes, 3) Create a barrier, 4) Mesh screens such as hardware cloth, 5) Remove trash from property, 6) Vacuum.	1) If in ground, first try pouring soapy water solution into entrance. 2) For aerial nests, use an enzyme solution to help loosen nest. Peppermint oil or dishwasher soap spray solution works also. Note: Homemade insecticidal soap is 1 heavy tablespoon of bio-degradable dish soap to 1 quart (1 liter) of water.
Whiteflies	Insect	1) General predators include lacewings, bigeyed bugs, and minute pirate bugs. Several small lady beetles including <i>Clitostethus arcuatus</i> (on ash whitefly) and scale predators, such as <i>Scymnus</i> or <i>Chilocorus</i> species, and the Asian multicolored lady beetle, <i>Harmonia axyridis</i> , feed on whiteflies.	Remove debris and habitat.	1) Whiteflies can be difficult to control with insecticides. Most less-toxic products such as insecticidal soaps or neem oil control only those whiteflies that are directly sprayed. Therefore, plants must be thoroughly covered with the spray solution, and repeat applications may be necessary. Be sure to cover undersides of all infested leaves; 2) Avoid using other pesticides (other than soaps and oils) to control whiteflies; not only do most of them kill natural enemies, whiteflies quickly build up resistance to them, and most are not very effective in garden situations.

Distributed by the Portland Sustainability Office - Pesticide Management Advisory Council

Sources: <https://beyondpesticides.org/resources/managesafe/choose-a-pest?pestlocation=outdoor#headerphoto>
https://www.maine.gov/dacf/mfs/forest_health/insect_disease_fact_sheets.html

"NOFA Standards for Organic Land Care: Practices for the Design and Maintenance of Ecological Landscapes," 6th edition, 2017 (there isn't an au