

Alternatives to Synthetic Pesticides: A Guide for Schools, Businesses & Residents

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Introduction

The urban pesticides that we discuss here can be divided into i) phytosanitary (or ‘plant protection’) chemicals including insecticides and herbicides that are applied directly to outdoor and indoor plants, and ii) insecticides used to control insects in and around the built environment / estates and facilities contexts, including indoor spaces, and outdoor areas such as outer walls, pavements, patios, rooftops, and entrance points. The following guide offers simple alternatives for how to manage unwanted vegetation and insects in both of these contexts.

1. Alternatives to phytosanitary / ‘plant protection’ chemicals

1.1 Plant-care

Unwanted vegetation in your garden / patio / adjoining pavement / pathways / school grounds etc, can be removed with a hoe or by applying boiling water directly on plants growing in cracks. Manually pull up plants if they are big enough, e.g., dandelions or young tree saplings such as Buddleia. Or if they’re not causing structural damage, leave them be – many so-called ‘weeds’ are simply flowers or wild herbs that have all sorts of benefits and traditional medical uses.

If they do not present a trip hazard or are not poisonous, many such plants can be appreciated as flowers that provide vital nectar for pollinators, food for caterpillars, and habitats for a myriad of invertebrates, birds and mammals.ⁱ Dandelions, which are often treated with herbicides due to their deep roots, and the persistent idea that they are ‘weeds’, produce more nectar daily than any other common garden flower, with the exception of White clover.ⁱⁱ Dandelion flowers and roots, and many other plants that many people see as ‘weeds’ are also important components of western medical herbalism. Garlic mustard which will grow in abundance almost anywhere if left to grow, is highly sought after by Orange-tip butterflies which lay their eggs on them, as it is also their caterpillars’ food plant.

1.2 Tree-care

The area around trees is often treated with herbicides in the mistaken belief that 'protecting' the tree from overgrown grass can reduce mould growth and keep the surrounding area looking 'neat and tidy'. Trees are plants too and herbicides are harmful to them, the wildlife that they support, and the soil that is vital to their ecosystem. Grass can be left to grow around trees. Note that trees can also be harmed by strimming and mowing which can damage the bark, as well as the roots in the topsoil. Think of trees found in natural woodland - they thrive without the surrounding plant-life being sprayed, mown or strimmed.

Ivy is often removed from trees due the false belief that it is a parasitical plant that weakens and kills trees. In fact, ivy plants have separate root systems and so rarely cause damage. Generally, ivy should be left alone as it is a fantastic resource for invertebrates. Brimstones, Red Admirals and Peacock butterflies will overwinter in the shelter provided by an ivy-clad tree. Holly Blues need ivy for their second brood of caterpillars in the summer months (the first brood feeds on Holly). Ivy, if left to climb, will flower, providing nectar late in the year, at a time when many other plants have already died back. This is invaluable for late autumn pollinators still on the wing. Ivy bees only awaken late in the year to capitalise on this bounty!

1.3 Insect-care

Many insects that feed on garden and household plants and that are commonly treated with phytosanitary insecticides, play vital roles for biodiversity, and are harmless to human health. Ladybirds, for instance, are the gardener's friend as their larvae devour aphids. Flying ants are an important food source for insectivorous birds like swifts. Moths and wasps are as vital as plant pollinators as honey bees.

If you are concerned about being stung, outdoor flying wasps can be controlled using simple traps. The best way of dealing with aphids is to avoid them in the first place through encouraging beneficial insects such as ladybirds and hoverflies, and the easiest way of doing that is to avoid garden pesticides altogether. If you do have aphids, pesticide-free solutions can be as simple as plain water.ⁱⁱⁱ Please remember that insect numbers have fallen by 75% in the last 25 years, irrespective of habitation.^{iv} We desperately need insects for our planet's ecosystem to function properly.

Although ant-killing powder or granules are commonly used around buildings (see below) they are often marketed separately for use in gardens. This is unfortunate and inexplicable given that ants are essential components of healthy soil ecology and do no damage in such environments. Crucially, ants are key soil modifiers, improving soil fertility, increasing plant diversity and acting as crucial 'ecological engineers'.^v

2. Insect-control in and around the home and the built environment / estates and facilities

Many of the flying and crawling insects that are commonly treated with insecticides in and around the built environment are also entirely harmless to humans. There is rarely a need to kill off insects such as ladybirds, ants, or spiders, let alone use synthetic pesticides to do so. By understanding insect behaviour and life cycles, many household insects, including flies and wasps, can easily be encouraged to go outside, and children often enjoy helping to gather them up or transport them carefully, either by hand or by using the simple jar-and-cardboard trapping method.^{vi}

2.1 Ant nests

If an ant nest is situated in a location that does not present a problem to a building's stability, for example an external patio, flower-bed, or pathway, it should be left alone. Ants are vital to a properly functioning soil ecosystem and provide food for other invertebrates, birds and mammals. Blackbirds even use them to remove parasites from their feathers!

However, if ants are coming indoors, as they often do when the nest is situated next to or within an outer wall, remedial action may be required. While we don't like killing insects, it's important that we're able to suggest effective alternatives, especially to schools and organisations who need a quick solution, rather than just say 'leave the ants alone', as this is more likely to make people feel that there is no alternative to using poison. That said, less well-established colonies can sometimes be encouraged to leave through non-destructive deterrents, but these require much more trial and error, and understanding of ant behaviour.^{vii}

Since ants can be more of a problem in older buildings, often calling for repeated insecticide use over many years, basic infrastructural design and maintenance are crucial means for stopping such cycles. New-builds present ideal opportunities, therefore, for embedding integrated pest-control measures into overall building design and function over its life cycle.

The simplest way to get rid of ants if they are coming inside through a crack is by applying a 50:50 mixture of bicarbonate of soda and sugar, alongside ensuring that any ant trails are removed with vinegar, and that entrance points are sealed up.

Such measures can be more effective than carbamate or pyrethroid-based insecticide powder applications, and without any of the long-lasting neurotoxic impacts that the latter pose to humans and wildlife.^{viii} Being a mechanical method that allows for the mixture to be transported to the nest itself, the root of the problem is thus treated without the need for repeated retreatment as is often required with synthetic pesticides.

Note however that it can take longer than topical poisons for ants to disappear. People often think it's not working and so resort to either synthetic poisons, or to other mechanical solutions such as boiling water that kill visible ants. This can be counterproductive as all it achieves is the destruction of crawling insects. What is needed is for the solution to be taken back to the nest and this can't happen if the ants are all dead! So please be patient and trust that this method *does* work!

Moreover, insecticidal dusting powders, by their very nature, tend to spread far beyond their site of application by wind and footfall, and this 'drift' action can continue long after application, as the chemicals they contain are highly volatile, environmentally persistent, and have very long half-lives. This means that they can have all sorts of unintended consequences for non-target wildlife and for human health, especially those with hypersensitivities to active ingredients.

2.2 Wasp nests in the built environment

If it is possible to do so, one can simply rope off the area around a wasp nest and encourage children and staff to leave it alone until it is abandoned in the colder months. Wasps are not aggressive unless they are defending the nest or provoked in some way. Sometimes, however, a wasps' nest does present a safeguarding issue and its removal becomes necessary, especially if there are concerns about people with wasp sting allergies. There are effective non-chemical ways for this to be done, either directly by a professional, or with the advice of a wildlife-friendly 'pest-control' agency.^{ix}

2.3 Clothes and 'meal'/pantry moths

Many commercial moth repellents and treatments, even those marketed as containing 'natural' essential oils, have pyrethroid-based active ingredients that are harmful to non-target wildlife and human health. Clothes moths are best prevented by not letting them get into clothes storage areas in the first place, discouraging environments such as unattended dark spaces (e.g., closed wardrobes), where moths can breed unnoticed, and only putting away thoroughly cleaned clothes (moths are attracted to the bacteria on unwashed clothing). Natural deterrents against both clothes and pantry moths include pure essential oils such as lavender, rosemary, peppermint or clove. Another method for controlling moths involves the

use of parasitoid *Trichogramma* wasps. Where infestations have already occurred, affected items should be removed, and storage areas thoroughly cleaned with a water/vinegar solution. Wool items that show signs of moth-damage, can be placed in the freezer to ensure that all the larvae /eggs have been killed off before re-storing in a cleaned environment.

3. Pesticides and health

Research shows that exposure to pesticides is linked to a host of diseases including Cancer, Childhood Leukemia, Parkinsons, and long-term conditions such as autism, and ME/Chronic fatigue syndrome (CFS).^x Additionally, some people with allergies and chronic illnesses are less able to metabolise these chemicals than others and can become acutely ill on exposure to even traces of pesticides. A single application of insecticidal powder outside your home or school can cause serious immediate and long-term risks to these vulnerable groups in ways that are not dissimilar to the long-term consequences that a pile of powdered nuts dumped on a pavement might have for people with extreme nut allergies! For all of these reasons, pesticides are an important consideration in conversations about environmental justice, health equality and disability access rights as well about biodiversity and ecological conservation.

Links

Website: www.pesticidefreecambridge.org

Email: info@pesticidefreecambridge.org

Facebook: <https://www.facebook.com/profile.php?id=100069575551941>

Twitter: <https://twitter.com/PANUKPFC>

References & Further Reading

ⁱ <https://www.rspb.org.uk/birds-and-wildlife/advice/gardening-for-wildlife/animal-deterrents/organic-pest-control/>

ⁱⁱ <https://www.plantlife.org.uk/uk/about-us/news/no-mow-may-how-to-get-ten-times-more-bees-on-your-lockdown-lawn>

ⁱⁱⁱ <https://www.almanac.com/pest/aphids>

^{iv} Hallmann C.A, et al., 2017, "More Than 75 Percent Decline over 27 years in Total Flying Insect Biomass in Protected Areas", *PLoS ONE* 12(10):e0185809. <https://doi.org/10.1371/journal.pone.0185809>

^v Farji-Brener A.G., & V. Werenkraut, 2017. 'The Effects of Ant Nests on Soil Fertility and Plant Performance: A Meta-Analysis', *J Anim Ecology*, 86 (4):866-877. doi: 10.1111/1365-2656.12672.

^{vi} <https://veganfta.com/2022/07/13/the-thing-about-wasps/>

^{vii} <https://www.theguardian.com/lifeandstyle/2021/jul/05/spare-that-flea-how-to-deal-humanely-with-every-common-household-pest>

^{viii} [https://ants.com/baking-soda-the-non-toxic-way-to-get-rid-of-ants/;](https://ants.com/baking-soda-the-non-toxic-way-to-get-rid-of-ants/)

<https://www.pesticidefreecambridge.org/community-awareness-building>

^{ix} <https://humanewildlifesolutions.co.uk>

^x <https://www.pesticidefreecambridge.org/pesticides-and-health>