

## **Glasshouse hygiene – Winter cleaning**

As Winter approaches and the new growing year draws nearer, it's time to start thinking about cleaning the greenhouse in preparation for the new crop. Greenhouse cleanliness is of paramount importance to prevent any disease and infection spreading through your plants, and also to help maintain the general condition of the greenhouse.

Any old compost and fertilizer bags can harbour a range of insects and diseases and should ideally be kept somewhere else such as the garden shed. Also, try to avoid leaving any dead vegetation in the greenhouse, put it on the compost as soon as you can. Pots, seed trays, tools and staging should be washed with warm water and a little household (or horticultural) disinfectant. Clay pots can be soaked in a bucket of warm water to remove caked-on dirt and soil.

Give the inside of the greenhouse a good wash down with warm water and disinfectant. If you have a pressure washer, you can use it to gently remove dirt from the corners and crevices. A pressure washer is also useful for removing the strips of algae that form wherever the panes of glass overlap. Give the interior a spray with disinfectant after pressure washing and rinse again.

When you finished cleaning, check the hinges and sliding mechanisms on the doors and ventilators. Apply some light oil or WD40 where needed and replace any missing glazing clips. If you have automatic openers, refer to the manufacturer's instructions regarding maintenance.

Try and treat the greenhouse environment as you would any other room in your house; a decent level of cleanliness will result in happier, healthier plants and crops.

# Instructions: American Gardening Club

1

Keep conditions in your greenhouse as hygienic as possible. Don't bring diseased plants into the greenhouse if it is avoidable. If you must bring in contaminated plants, isolate them. Remove any decomposing plant or fruit matter.

2

Removing algae from the greenhouse glass. First wet the algae thoroughly to loosen the deposits, then scrub them off with warm, soapy water and a scrubbing brush. A plastic plant label is useful for cleaning between panes of glass where algae have accumulated.

3

Have a thorough cleanup every autumn. Clear out the plants while you scrub down the glass and frame, both inside and out. Throughout the year, sweep the floor and staging as needed to remove fallen leaves and plant debris, since these often carry fungal spores and provide a perfect site for fungi or pests to overwinter.

4

Renovate wooden greenhouses. With a wooden greenhouse, you need to keep the frame in good condition. Clean the wood each year and treat it with preservative every 1 to 3 years. Avoid using a substance that is harmful to plants, such as creosote. Repair small rotting areas with wood filler.

5

Pinch out dead and dying foliage, flowers and stems promptly, since they may cause dieback. Remove weeds from pots and gravel to keep air circulating well and prevent competition for moisture and nutrients.

6

Wash out all pots and trays after they have been used. As you finish with pots and trays, scrub them out so that they are clean and ready to use again. Keep your water source clean so that it does not harbor diseases

7

Keep a regular check on the state of the greenhouse framework, along with any ventilation, watering or heating systems. Any damaged areas or operational problems should be dealt with before they have a chance to become serious. Regular checking need not take long, but combined with prompt action, it can save a lot of damage in the long run.

## **Hygiene and maintenance (RHS)**

Once you're using your glasshouse you need to keep on top of the maintenance, both to keep it an effective and hygienic place to grow plants and to lengthen its life.

Autumn is a good time to carry out most maintenance tasks as you generally have fewer plants inside the greenhouse and it's still warm enough to move any residents outside while cleaning. If you tend to use the greenhouse less at other times of year then you may wish to carry out the maintenance then instead.

Before cleaning remove all the plants, staging and other equipment. Ensure you have protective equipment for yourself, such as gloves and goggles. Having disinfectant dripping into your eye from a greenhouse ceiling isn't much fun!

The glazing should be cleaned at least once a year, both inside and out. A proprietary window cleaner or similar detergent can be used outside. Inside a disinfectant must be used. The aim of the cleaning is to remove any grime which has been reducing light transmission and any trace of diseases (such as fungal spores or pest eggs). Use a plastic plant label to scrape out grime from between the glazing panes.

The framework and floor should also be cleaned (again using disinfectant inside). The opportunity should be taken to carry out any repairs to the glazing and framework. Wooden and steel frames will require re-painting every few years.

Check all the gutters and any downpipes to ensure they aren't blocked or cracked. Doors and vents should be oiled if necessary to ensure smooth opening.

Scrub the staging with disinfectant and clean any other equipment which you don't clean regularly. Pots and other containers should also be washed with disinfectant.

Check all equipment, such as heaters, fans and watering systems, is working correctly. If possible, run watering systems through with disinfectant (rinsing them thoroughly afterwards).

Greenhouses can be fumigated (eg with a sulphur candle) to rid them of any remaining pests and fungal spores. Ensure you follow the instructions carefully, particularly in relation to whether you and/or your plants can remain in the greenhouse while it is being fumigated.

On a more frequent basis you should remove weeds from greenhouse borders, clean obvious dirt from the glazing and wash equipment/pots/containers with disinfectant between uses. Any shading applied in the summer should be removed in the autumn as the days shorten, shading paint is best removed by rubbing with a cloth.

# Greenhouse Pests – fighting the Summer Onslaught

## **Greenhouse Pests – fighting the Summer Onslaught Biologically**

Summer is a great time for the garden – plants are growing fast, flowers are blooming and crops are ripening fast. But it's also a great time for pests, especially in the greenhouse. You will never eliminate them completely but there are some simple steps you can take to keep them at bay.

The first, and most obvious, is to keep your plants healthy. A strong and vigorous plant has a much better chance of fighting off pests and diseases than one which is struggling with fluctuating temperature and humidity, poor soil conditions and lack of nutrients.

Next, remember the old adage – cleanliness is next to bug-lessness. If you didn't give your greenhouse a spring clean a few months ago, those dark corners of festering compost, old leaves, flowers and other detritus will be a wonderful breeding ground for grey mould and other fungi and also may harbour mealybug eggs.

Make sure that you have a healthy circulation of air. To get at least one air change an hour, you need a combination of good roof ventilation and side vents, or an open door. If your roof ventilation is less than 20% of your total floor space, you may need to install some forced ventilation such as blower fans.

Finally, be alert! Examine the leaves, stalks, flowers and fruit of your plants every day. Hang up those yellow sticky cards – not only will they help to trap flying bugs, but they're also a great indicator of impending trouble. Of course, if you find your plants dying mysteriously, remove them and their soil immediately.

So what are the most common summer threats to your little garden of Eden? The list is not actually that extensive and there is specific action you can take to rid yourself of most of them

The main culprits are glasshouse red spider mite and whitefly, leafhoppers, scale insects, vine weevils, mildew and grey mould (botrytis).

## **Glasshouse Red Spider Mite**

This is a tiny (0.5mm) mite that spends most of its summer in disguise with a greenish colour and two dark spots on their back. They shed their disguise in the winter, turning the familiar red.

The Red spider Mite sucks the sap of plants, causing the top surface of leaves to have a mottled appearance with bronze speckling, while the mites themselves and their eggs can be seen on the underside of the leaf. In severe infestations, the leaves may be covered in a fine web and the plant itself may die.

These mites love hot, dry conditions, so regular damping down in the greenhouse and spraying with a mister will make a big difference. Insecticides don't always work well here as some strains of the mite have become resistant. The most effective control is an organic one.

So long as the temperature is 21°C or higher, you can introduce the predatory mite, - *phytoseiulus perimilis* -, which feeds on the eggs and active stages of the red spider mite. Below this temperature, the good mite won't breed faster than its quarry. Don't forget, if you are using organic solutions like this, avoid using chemical controls as well or you will kill your little friends.

## **Mealybug**

Another sap-sucker, this little chap can be harder to spot as he tends to congregate with his buddies in enclosed parts of a plant such as under bark, or in leaf sheathes. The first indication of a mealybug problem is white waxy substance that appears around the areas where they feed.

As they suck the sap of the plant, they excrete sticky honeydew which, in turn, attracts sooty moulds, so making parts of the plant appear black.

Again, cleanliness and good ventilation are important to keep mealybugs at bay but if you need to remove an infestation, there are plenty of contact and systemic chemicals available. Alternatively, just release a few ladybirds into your greenhouse. Both the adults and their larvae will find and eat mealybugs and their eggs.

## **Glasshouse Whitefly**

A relative of the familiar whitefly that infest brassicas, this is also a sap-sucker that produces sticky honeydew which in turn attracts sooty moulds. Thankfully these little fellows are easy to spot – just brush past an infected plant and you'll see a cloud of tiny white flies take off.

As well as the gift of flight, whiteflies are blessed with an astonishingly rapid reproductive rate, and don't respond well to chemical controls. There are things you can do to keep them under control though.

Firstly, hang up some of those sticky yellow cards to trap the flying adults. Try planting strong-smelling plants like basil and tagetes among your tomatoes and spray the underside of leaves with a weak soapy spray every few days. This will kill off emerging adults.

The ultimate weapon is the tiny parasitic wasp, - ***encarsia Formosa*** -, which thrives on whitefly nymphs, though you have to be careful to avoid using chemicals or even soapy sprays if you go for this solution. This will kill off emerging adults.

### **Leafhopper**

Yet another sap-feeding insect, the leafhopper is about 3mm long, pale yellow, and the adults will jump and fly for a short distance when disturbed. You will often find the cast-off skins of the nymphs attached to the underside of leaves. An infected plant will have a mottled appearance on the leaves.

Chemicals can be used to rid your greenhouse of this pest or you can introduce the Might Atom – ***anagrus atomus*** – a tiny parasitic wasp which lays its eggs inside the eggs of the leafhopper.

### **Scale Insects**

More sap-suckers – this time a whole sub-species of them who suck the sap of plants, weakening their growth. Scale insects live up to their name by appearing like small scales or lumps on the stems or underneath the leaves of plants. They vary in colour from yell to brown. Chemical control is made more difficult by the impervious shell which gives them their name, but shell-less nymphs are susceptible.

Another parasitic wasp, ***Metaphycus helvolus***, can be introduced but this will only control two species, the hemispherical scale insect and the soft brown scale insect.

### **Vine Weevil**

This is one of the most voracious greenhouse (and indeed garden and houseplant) pests. The black, beetle-like adult (about 9mm long) will cause damage to leaves, leaving a characteristic, unsightly but relative harmless, serrated edge to leaves. The real problem is the weevil's breeding habits. All vine weevil adults are female and are capable of laying up to 1,000 eggs through the summer. Their unruly children – the larvae – look like miniature Jabba the Huts and can cause mayhem in your greenhouse. These white, maggot-like grubs, live in the soil and feed on the roots of plants, damaging not just roots, but tubers and succulents too.

The adults are best controlled by manual removal (ideally at night by torchlight) or by using sticky barriers. The larvae can be controlled

using chemicals applied as a drench to the compost but these cannot be used on edible plants. The most effective control is the introduction of predatory nematodes in August or September, when the soil is warm enough to support them and before the larvae are big enough to cause real damage. Just keep a watchful eye though. Vine weevils breed fast and can return quickly if they are not stamped out straight away.

### **Mildew**

Powdery mildew is the most common type of mildew found in greenhouses. It looks like a white powder that starts by covering the upper side of leaves, spreading to the underside and then to shoot tips and flowers. It will eventually cause plants to distort and will weaken them. At the first sign of mildew, remove and burn the infect parts.

This mildew thrives in dry soil and stagnant air. The secret is to keep your greenhouse well-ventilated, don't place your plants too close to each other and water them regularly. There are chemical fungicides available but these cannot be used on edible plants – instead, use a solution of bicarbonate of soda at 5g per litre of water.

### **Grey Mould (Botrytis)**

Grey mould appears as a grey, fuzzy mould on all upper parts of a plant and can quickly cause buds and flowers to shrivel and die. It will infect the green part of plants through wounds or other damage, but in dank, humid conditions, it will spread fast, infecting fruit and flowers directly, causing extensive damage.

Currently there are no approved chemical controls for grey mould, the spores of which are always present in the air. But careful attention to cleanliness, good ventilation and controlled humidity in the greenhouse will give the best protection.