The Royal College of Pathologists
Pathology: the science behind the cure

THE LOW ALLERGY GARDEN

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Chelsea Flower Show 2016

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The Low Allergy Garden has been created by **The Royal College of Pathologists** to showcase plants that are ideal for people who suffer from hay fever.

One in four of the UK population suffer from hay fever, making it the country's most common allergy.

People develop allergies because of a combination of factors: genetics, age, gender, family history, family size, nutrition, childhood infections, pollution and much more.

An allergic reaction can cause symptoms such as a runny nose, sneezing, itchy eyes and mouth or rashes (all examples of localised inflammation). If more severe and widespread throughout the body (systemic inflammation), it is known as **anaphylaxis** or **anaphylactic shock.**

Other examples of allergic reactions are asthma and eczema.

ITCHY EYES, RUNNY NOSE?

Our immune systems are good at ignoring substances that do us no harm. But in people with allergies, the immune system makes an antibody, **Immunoglobulin E** (IgE), to these substances (allergens). Allergens can be anything from grass, tree or weed pollens to medicines, peanuts, dust, mites, venoms, parasites and moulds.

Mast cells found in our skin, nose, eyes, mouth, throat, stomach and gut have tiny granules containing chemicals, including **histamine**. IgE binds to the surface of mast cells, which become **'IgE-sensitised'**. These cells remember the allergens next time they come in contact with them. Within seconds of the next exposure the mast cells release the chemicals into the bloodstream, causing an allergic reaction. This is why one of the over-the-counter medicines for allergies is **antihistamine.**

WINDBORNE POLLEN

Pollen is used for transferring genetic material from the **anther** (male part) of one flower to the **stigma** (female part) of another flower.

Wind-pollinated plants rely on the wind to transport their pollen, which is inefficient. To ensure at least some of this pollen lands on the right stigmas, they produce billions of pollen grains. Once these grains are airborne, **we can breathe them in and they can cause symptons in people with pollen allergies.**

Insect pollination is much more efficient but needs insects to fly into the flowers, collect pollen grains on their legs and bodies, and transfer them directly onto stigmas of other flowers.

By avoiding wind-pollinated plants, and using insect-pollinated ones it is possible to make a garden low allergy AND insect-friendly.

Comparing wind-pollinated and insect-pollinated flowers:

Wind-pollination	Insect-pollination
Small petals, often brown or dull green with no scent (no need to attract insects)	Large, brightly coloured petals, sweetly scented (need to attract insects)
High or moderate amounts of pollen	Low or moderate amounts of pollen
Pollen usually light and smooth so it is easily blown away in the wind	Pollen usually sticky or spiky to stick to insects

ALLERGY INVESTIGATION

If you have severe symptoms, or the symptoms are affecting your general health, it is important to see a doctor. They will take a detailed history asking your age, family history and about the possible allergens, your symptoms, what time of the year and where they occur. You may be referred to a specialist allergy clinic for testing and further advice.

Pathologists, biomedical and clinical scientists and allergists (specialist allergy clinic staff) have two main tests to diagnose an allergy.

ALLERGY BLOOD TESTING

Scientists can measure the amount of the IgE protein that recognises the allergen in the patient's blood. Those patients with allergic reactions will have a raised total IgE concentration.

How much IgE binds to specific allergens, e.g. birch pollen, can also be measured.

SKIN PRICK TESTING

A small drop of pre-prepared allergen solution is added to the patient's skin on the inner forearm and the skin is pricked through the drop using a special blunt lancet. This should not hurt or bleed.

About 20 minutes later, the skin is checked for any reaction – such as a small, local allergic response of a **wheal** (bump) and **flare** (redness). The size of the wheal and flare is measured and compared to the reaction to a control sample. (A positive control causes a reaction in everyone, a negative control shows no reaction in anyone.)

Skin Prick Test

THE CHOICE IS YOURS

The plants in this garden have been carefully chosen as they have low amounts of pollen or are insect-pollinated. Here are some plants that are suitable for creating your own low allergy garden:

- Abelia
- Ajuga
- Alchemilla
- Aloysia
- Antirrhinum
- Aquilegia
- Arbutus
- Astrantia
- Begonia
- Camellia sinensis
- Choisya ternata
- Clematis
- Citrus x limon
- Coleonema
- Cotoneaster
- Delphinium
- Digitalis
- Dicentra
- Eryngium
- Gaultheria
- Geum
- Genista
- Geranium
- Hebe
- Hedera
- Hemerocallis
- Heuchera
- Hosta
- Impatiens
- Iris
- Lamium
- Leptospermum
- Lobelia
- Nigella
- Papaver
- Parthenocissus
- Penstemon
- Plumbago
- Prunus
- Punica
- Pyrus salicifolia
- Rosemarinus
- Salvia
- Scabiosa
- Thalictrum
- Thymus
- Trachelospermum jasminoides
- Viburnum
- Vinca
- Viola
- Vitexagnus castus
- Vitis

WE HOPE YOU ENJOYED THE EXHIBIT.
PLEASE TELL US WHAT YOU THOUGHT.
@RCPath #RCPathCFS

CHECK THE CALENDAR

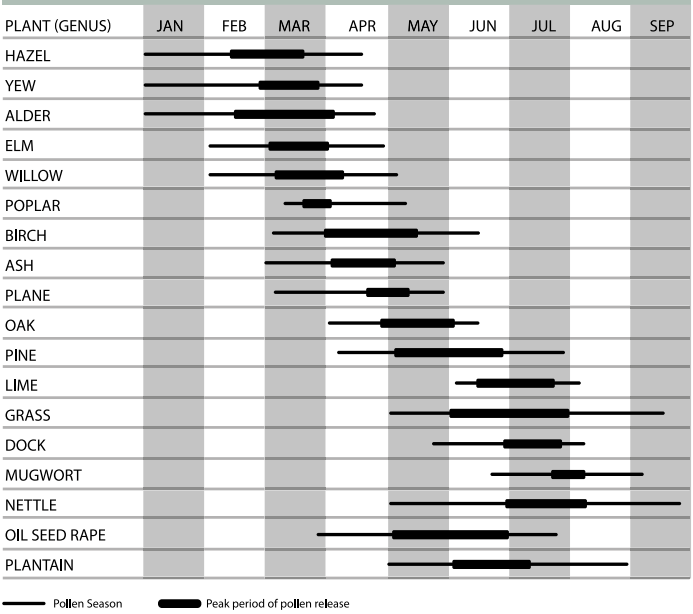
Each plant has a predictable flowering season. Trees are the first to flower in January, finishing in late April. Grasses flower in late spring, and finally the weeds in the summer. Within these groups, there are differences e.g. hazel trees flower before birch trees.

If you find that you sneeze, cough, have an itchy, runny nose and eyes at certain times of the year, you may have seasonal allergies to a specific species.

Have a look at the pollen calendar to find out what might be causing your hay fever.

A day-to-day pollen forecast can be found at the metoffice.gov.uk website.

THE POLLEN CALENDAR



STRATEGIES TO AVOID YOUR ALLERGEN TRIGGERS AND ALLERGY SYMPTOMS

- Monitor pollen and mould counts. Weather reports in newspapers and on radio and television often include this information during allergy seasons. The Met Office website has up-to-date information on pollen counts.
- Keep windows closed when indoors. This is most important in the early mornings, when pollen is being released, and in the evening when the air cools and pollens that have been carried up into the air begin to fall to ground level again.
- The pollen count is highest between 5 am and 10 am and again at dusk, so plan your outdoor activities when the pollen count is lower.
- Stay inside on dry, windy days – the best time to go out is after rain which helps clear pollen from the air.
- Take a shower, wash your hair and change your clothes after you've been outdoors.
- Try to avoid mowing the lawn or keep lawns regularly mown to stop them flowering and producing pollen.
- If you do need to mow the lawn or do other gardening activities, wear a NIOSH-rated 95 filter mask.
- Don't hang laundry outside - pollen can stick to sheets and towels.
- If high pollen counts are forecast, start taking allergy medications before your symptoms start.
- Apply an effective allergen barrier around the edge of each nostril to trap or block pollens and other allergens and help prevent a reaction. Allergen barriers are available as balms and some people have found petroleum jelly can help.
- Wear wraparound sunglasses when outdoors to keep pollen allergens out of your eyes.
- A hat with a peak or large brim can help keep pollens from your eyes and face.
- Pollen counts tend to be high along roads with grass verges (dual-carriageways, motorways). Keep car windows closed and the air intake on 're-circulate' when driving. Choose a car that is fitted with an effective pollen filter, or get an in-car air filter.

THE ROYAL COLLEGE OF PATHOLOGISTS

The Royal College of Pathologists is a professional membership organisation committed to setting and maintaining professional standards and to promoting excellence in the teaching and practice of pathology. It is a registered charity and has over 11,000 members working in hospital laboratories, universities and industry worldwide.

Today pathology consists of a range of different specialties, including cellular pathology, haematology, clinical biochemistry and medical microbiology. It is the science at the heart of modern medicine and pathologists are vital to the diagnosis and clinical management of disease. Pathologists work for the benefit of the living, explaining why and how people fall ill and helping to determine the best treatment for each individual patient. For example, immunologists are the pathologists who run the specialist laboratories that provide testing for people with allergies.

To raise awareness of the vital role of pathology in healthcare and to encourage students to consider a career in pathology, the College runs a public engagement programme which includes National Pathology Week which will be held this year from 7-13 November.

www.rcpath.org
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