



RHS science update

IMPATIENS DOWNY MILDEW

A virulent disease, Impatiens downy mildew, devastated busy lizzies in gardens and nurseries resistance to the fungicides used to treat it. Research into the fluid situation of the epidemic

Author: **Liz Beal**, a Plant Pathologist working within Plant Sciences at RHS Garden Wisley

across Britain in 2011, having developed resistance to the fungicides used to treat it. Research into the fluid situation of the epidemic continues. Here is the current state of play

1 Flower power and good ground cover – little surprise perhaps, that busy lizzies are among the most popular of summer bedding.

2 Beds at RHS Garden Wisley stricken with Impatiens downy mildew.

3 Plants lose nearly all their leaves and stop flowering.

4 Impatiens Sunpatiens Series, hybrids of New Guinea impatiens, so far have shown good resistance to the disease.

A busy lizzie infected with Impatiens downy mildew (right).

Busy lizzies (selections of *Impatiens walleriana*) are among the most popular bedding plants in the UK, with total industry sales estimated at up to £40 million (B&Q alone sell some 20 million plants a year). In 2003 the disease called Impatiens downy mildew was first found infecting busy lizzies in the UK, imported (it is thought) on infected cuttings material. It remained at low levels or absent, but reappeared in 2007 and 2008.

Initially, the Food and Environment Research Agency (FERA) took statutory action, requiring outbreaks to be reported to regional Plant Health Seed Inspectors, but this ceased as the disease seemed containable.

A successful chemical spray programme was applied by nurseries producing busy lizzies to control the disease, but in 2011 the pathogen developed fungicide resistance and widespread outbreaks occurred early in the season (see box, opposite).

The disease, caused by *Plasmopara obducens*, is a downy mildew, related to *Phytophthora* (such as *P. infestans*, tomato and potato blight); both are more closely related to algae than fungi. Despite a similar name and symptoms, *P. obducens* is

unrelated to powdery mildews, which are true fungi. Spores present on the underside of infected leaves spread the disease. These are conveyed by splashing rain and also carried long distances on the wind. Spore production and

infection require extended periods of leaf wetness, so severe outbreaks are more likely in wet summers.

The airborne spores remain viable for just a short time; however, work funded by the Horticultural Development Company recently confirmed that the pathogen also produces resilient overwintering oospores. These resting spores are released into the soil as plant material breaks down and may survive for an extended period, perhaps several years. This is a significant problem in gardens, where infections could be carried over from year to year. To date, fortunately, research by FERA has not detected any seed-borne infections.

Recognising symptoms

Affected plants show yellowing leaves, which are rapidly shed from the plant from early summer onwards, depending on the weather.

Ideal conditions for sporulation (spore production) are high humidity, regular rainfall and lower temperatures. A fine white fungal growth may then be visible on the underside of infected leaves. Few or no flowers are produced; commonly, plants are reduced to bare branches with only a small tuft of yellow leaves and flower buds at stem tips. Eventually severely affected plants will die.

Managing the disease

Unfortunately, infected plants cannot be treated by home gardeners as no suitable fungicides are available. Plants showing symptoms of downy mildew should be disposed of (not composted) by burning or burying at least 30cm (12in) deep.

If you do decide to grow busy lizzies this year, the following precautions should reduce the disease's severity:

- ❖ Check plants regularly for the

disease and promptly remove and destroy any that are infected.

- ❖ Improve air circulation by planting in hanging baskets or leaving more space between plants.
- ❖ Avoid overhead irrigation, which wets leaves and helps spores to spread.
- ❖ Apply a general-purpose fertiliser from June onwards to encourage vigorous growth.
- ❖ Avoid planting busy lizzies in beds known to be previously infected with Impatiens downy mildew or you may expose them to resting spores.
- ❖ Grow plants yourself from seed.
- ❖ Avoid plants raised from imported cuttings material (the probable source of the disease). Ask your supplier where the plants originated and if they are seed-raised. ●

www.rhs.org.uk For more information, search 'Impatiens downy mildew' at RHS Online.

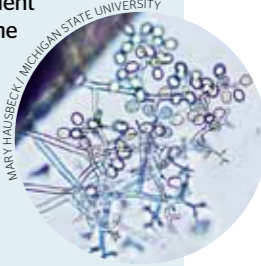
The disease today and future outlook

Until 2011, Impatiens downy mildew (inset, seen under a microscope) was controlled by growers with a fungicide programme using the active ingredient metalaxyl-M. However, in 2011, tests for a project funded by the Horticultural Development Company confirmed that isolates of the pathogen (taken from imported cuttings material) have developed resistance to metalaxyl-M.

This is a major issue, as there is only a limited number of other approved professional fungicides effective against downy mildew on busy lizzies. For this reason, many young-plant suppliers are not selling busy lizzies at all in 2012.

The disease has been confined to *Impatiens walleriana*, but all members of the *Balsaminaceae* family may be at risk. It has yet to be found on New Guinea impatiens (*Impatiens hawkeri* cultivars) or on the few species of *Impatiens* found growing in the wild in the UK, such as *I. glandulifera* (Himalayan balsam).

New hybrids called Sunpatiens Series 4, claimed to be resistant to downy mildew, have been introduced by Japanese plant breeders Sakata. When Sunpatiens Series plants were grown next to infected *I. walleriana* they remained disease-free. There remains the risk that the resistance may collapse with changes in the population of the downy mildew pathogen, and until Sunpatiens Series is more widely grown and exposed to high levels of the disease, it is not possible to tell just how robust its resistance is.



Alternative plants

Following the poor performance of busy lizzies last year, many gardeners will be looking for alternative plants (see RHS Advice, p35). Being such good value for money, and particularly valuable for colour in damp, semi-shaded areas, busy lizzies can be hard to match.

In sunny or lightly shaded areas there are many substitutes, including French and African marigolds (*Tagetes*), petunias, *Sutera cordata* 'Snowflake' (syn. *Bacopa*) and fuchsias. Many begonias (inset, below) are robust and will tolerate shade, as will fuchsias and lobelias.

New Guinea impatiens are not affected by Impatiens downy mildew. But New Guinea impatiens are more expensive than busy lizzies, and will not thrive in the same shady conditions as *I. walleriana* hybrids. They need warmth and shelter to do well and are best suited to baskets or containers in sheltered parts of the garden.

p35
Busy lizzie alternatives

