

Scientists lead the way in tackling Japanese knotweed

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Following extensive trials, a team of bioscientists at Swansea University have developed an effective way to tackle Japanese knotweed, listed by the World Conservation Union as one of the world's worst invasive species, and an issue of huge concern to householders in the UK.

In 2016, Professor Dan Eastwood and Dr Dan Jones completed the first phase of the world's largest Japanese knotweed field trial. After five years of intensive research they have defined a patent on one aspect of potential Japanese knotweed control treatment known as 'The 4-Stage Model'.

Professor Eastwood said: "Basically, we're discovering how best to tackle invasive plants in real-world conditions, informed by the evidence of what actually works.

We began focusing on knotweed at a time when there was a great deal of hysteria surrounding it. At the time, most information for people affected by the plant was largely based on anecdote. This led to the prospect of unscrupulous companies offering expensive and ineffective treatment solutions. It was incredible to us that there was no long-term, large-scale field trial analysis of the treatment methods used to control Japanese knotweed.

Over five years, we tested all 19 of the main physical, chemical and integrated methods of controlling Japanese knotweed in the UK, working with the biology of the plant to inform our treatment approaches. Our

research tested more methods of control than any other invasive species trial ever conducted, allowing us to replace out-dated guidance based on short-term experiments and anecdotal information."

Building upon this research, Dr Dan Jones, who undertook his PhD on Japanese Knotweed s.l. 'Taxa and Introduced Petasites Species: Biosystematics, Ecology and Control', sponsored by Complete Weed Control, has now founded Advanced Invasives - a south Wales-based consultancy that solves complex [invasive plant species](#) problems, with a specialist focus on Japanese knotweed. ai:LAB, Advanced Invasives continuous research and development centre, operates in partnership with Swansea University's Department of Biosciences, and continues to deliver unique applied research into the control and management of invasive plant species.

Professor Eastwood said: "The Advanced Invasives approach has huge potential to deliver impact through outreach activities, including working with Network Rail Cymru Wales and The South Wales Trunk Road Agency (SWTRA)."

Dr Jones said: "Unlike most other companies, we are evidence-led, and consider invasive plant problems from the ground up across the whole treatment lifecycle. We want to set a new standard of invasive species management; scientific and applied, to bridge the gap between scientific research and public understanding of invasive species management.

Claims made by companies, stating that they could eradicate Japanese knotweed using herbicides in short spaces of time have now been proven to be false, based on our experiments. Furthermore, we have shown that applying the wrong herbicides at the wrong time of the year, leads to greater herbicide use and environmental impacts. The 4-Stage Model that we have developed links herbicide selection and application with the seasonal surface-rhizome flows in the knotweed plant. This seasonal

targeting of knotweed delivers better results and uses lower doses of herbicide across the whole treatment lifecycle. For the public and land managers, this means more affordable treatment that is also more environmentally friendly than traditional, blanket herbicide application."

Dr Jones said: "The 4-Stage Model is the starting point for developing more effective and efficient knotweed control; there is no 'one size fits all' solution for managing knotweed. Our experimental benchmarking of all practical knotweed control methods does, however, ensure that methods that don't work can be discontinued in the future. Further, our on-going research provides us with an exclusive resource that allows us to continually update and refine our management approaches that we share with regulators, researchers, land managers, businesses and members of the public. In addition to on-going testing of the control methods that we started in 2011, we have now expanded our testing to include other invasive [plants](#), further herbicides and habitat restoration approaches, so that land affected by knotweed can be used to its highest potential."

The team has some advice for homeowners who are worried about the spread of knotweed:

- Ignore the hysteria - your house will not fall down. Knotweed can be controlled using glyphosate at the right time of year, though this can usually take three to five years. However, we don't recommend you do this yourself - we have seen mortgages declined because of botched treatment undertaken by homeowners.
- Knotweed is a resilient weed that cannot be controlled by one herbicide treatment in a single year, a claim frequently made by unscrupulous companies. Any treatment strategy should be long-term and target both the above-ground and extensive below-ground parts of the plant.

- Effective [treatment](#) centres on working with the biology of the plant and targeting the correct herbicide when the plant is vulnerable to its effects, from summer into late autumn (depending on the weather).
- Calling out a weed control company to control knotweed is not the same as calling out a plumber. We would expect the plumber to get the work done soon, if not immediately. If you call out a company in spring to control knotweed, quite rightly, you will need to wait until later in the year to get the best results - this will save you time, money and hassle in the long-term.
- Once knotweed has been effectively controlled using herbicide don't disturb this land by digging, for example, as it is likely to come back; even if the above-ground parts of the plant are dead, the below-ground rhizome system probably isn't. Again however, don't panic, if it comes back, call the contractors to regain control.
- Don't try digging out the knotweed yourself, it is easy to miss parts of the root and spread it and you cannot dispose of this plant material along with your garden waste - in fact, it is illegal to do this.

For most people, Japanese knotweed represents a nightmare, particularly if they are trying to sell their home. However, from an ecological perspective, Professor Eastwood, still can't help but be impressed by it: "Japanese knotweed is an extraordinary plant. In Japan, it often grows in the gravel around volcanoes and can be buried during eruptions and landslides, killing the above-ground parts of the plant. However, it is not dead, but rather dormant, awaiting more favourable conditions. Although many see Japanese knotweed as a scourge, as a biologist, you have to admire its resilience and the adaptations that has made it the pernicious weed it is."

More information: Advanced Invasives:

www.advancedinvasives.com/

Provided by Swansea University

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