Japanese knotweed

Scientific name: *Reynoutria japonica* var. *japonica* (previously *Fallopia japonica*)

Other Schedule 9 Species: Dwarf knotweed, Giant knotweed, Bohemian (hybrid) knotweed

What is Japanese knotweed?

Japanese knotweed is the most common of four invasive knotweed taxa present in the UK (Japanese and Dwarf knotweeds being varieties of the same species):

1a Japanese knotweed (*Reynoutria japonica* var. *japonica*)

1b Dwarf knotweed (*R. japonica* var. *compacta*)

2 Giant knotweed (*R. sachalinensis*)

3 Bohemian (hybrid) knotweed (*R. × bohemica*)

Where do invasive knotweeds grow?

Japanese knotweed is able to grow in most (if not all) soil conditions found in the UK, though these species show a strong preference for man-made habitats. Common habitats where invasive knotweeds are found include roadsides, waste ground, railway embankments and cuttings, mine spoil-tips and along rivers and streams.

How do invasive knotweeds spread?

Invasive knotweeds are long-lived (rhizome-forming perennial), competitive dominant plants that spread by direct rhizome (root) growth and from leaf, stem and rhizome fragments of the parent plant. Pieces of rhizome smaller than 1cm in length can grow into a new plant.

Legislation

Because of negative impacts on the UK environment and economy, all invasive knotweeds are listed under Schedule 9 of The Wildlife and Countryside Act 1981 which means it is an offence to plant or cause these plants to grow in the wild. Also, knotweed plant material is a ‘controlled waste’ under the Environmental Protection Act 1990 which means it can only be transported by a registered waste carrier to suitably permitted or exempt sites. Transfer notes shall be kept for each load for a minimum of 2 years.

Identification - Japanese knotweed

What does it look like?

Images A-H below show what Japanese knotweed looks like below and above ground throughout the year.

Where: A = dense rhizome (root) growth at 1-2m depth; B = detail of rhizome growth; C = cross section through living rhizome (note orange colour); D = dormant stem buds in early spring; E = developing stem buds in spring; F = late spring stem growth; G = full growth in mid summer; H = dead stems during winter dormancy.
Identification - distinguishing between invasive knotweeds

Key identification features

Invasive knotweeds look quite similar, though there are clear differences in the leaves and stems in particular. All invasive knotweed stems have distinctive nodes (stem segments); one leaf is held at each node, attached alternatively upwards along the stem (i.e., the leaves are not paired opposite one another at each node).

<table>
<thead>
<tr>
<th>Common name</th>
<th>Japanese knotweed</th>
<th>Dwarf knotweed</th>
<th>Giant knotweed</th>
<th>Bohemian (hybrid) knotweed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>2-3m in height</td>
<td>Up to 1m in height</td>
<td>Up to 4m in height</td>
<td>2.5-4 m in height</td>
</tr>
<tr>
<td>Lower leaf shape &amp; size</td>
<td>10cm</td>
<td>10-15cm long</td>
<td>Up to 10cm long</td>
<td>Up to 40cm long</td>
</tr>
<tr>
<td>Lower leaf description</td>
<td>Broadly oval, flattened at the base – feels quite tough to the touch with a smooth lower side</td>
<td>Broadly oval, flattened at the base – feels quite tough to the touch with a smooth lower side</td>
<td>Broadly oblong, heart-shaped at the base – feels quite delicate with a furry lower side</td>
<td>Intermediate leaf features – lower surface of the leaf often feels quite coarse</td>
</tr>
<tr>
<td>Stems</td>
<td>Red flecking</td>
<td>Red flecking</td>
<td>No red flecking</td>
<td>Some red flecking</td>
</tr>
<tr>
<td>Flower colour &amp; growth</td>
<td>Creamy white, branched</td>
<td>Creamy white, unbranched</td>
<td>Greenish white, branched</td>
<td>Creamy white, branched</td>
</tr>
<tr>
<td>Flowering period</td>
<td>August-October</td>
<td>August-October</td>
<td>August-September</td>
<td>August-September</td>
</tr>
</tbody>
</table>
Invasive knotweed lifecycle - control and management

Research
In 2018 Jones et al. published the first set of results from the world’s largest ongoing field-trial on Japanese knotweed control.

The research tested a number of methods of chemical and physical (mechanical) control. Results were unable to show that physical methods were effective and that, of the plant protection products currently available, use of the herbicide glyphosate at the time when the plant is most vulnerable to its effects, is the most effective means of controlling invasive knotweeds. Note that the growth stages in the diagram below are approximate and dependent upon invasive knotweed species, weather conditions and altitude.

Importance of the knotweed lifecycle
Timings of invasive knotweed growth stages are shown below along with recommended timings for treatment. Results of the Jones et al. (2018) research found that glyphosate-based herbicides are highly effective only if they are applied from mid-summer into late autumn (depending on the weather). This is when resources start to be drawn down from above ground growth into the rhizome; if these herbicides are applied sooner in the year, herbicide is not transported down into the rhizome and there is little to no impact on above ground growth in subsequent years.

Timing of invasive knotweed growth stages and treatment application

<table>
<thead>
<tr>
<th>Growth stages: approximate - species, weather and altitude dependent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bud development</td>
</tr>
<tr>
<td>Stem growth</td>
</tr>
<tr>
<td>Green leaves</td>
</tr>
<tr>
<td>Flowering</td>
</tr>
<tr>
<td>Die back</td>
</tr>
<tr>
<td>Dormancy</td>
</tr>
<tr>
<td>Treatment application - glyphosate-based herbicide</td>
</tr>
<tr>
<td>Biannual foliar spray</td>
</tr>
<tr>
<td>Stem injection</td>
</tr>
<tr>
<td>Annual foliar spray</td>
</tr>
</tbody>
</table>

Don’ts and Do’s of knotweed treatment

Note
This list of Don’ts and Do’s for knotweed treatment is based on research by Jones et al. (2018).

Don’ts

• Don’t consider undertaking knotweed treatment yourself unless you have the appropriate skills and experience. There are anecdotal reports of mortgages being declined as a result of inadequate/poorly undertaken treatment.

• Don’t think there is a quick fix – invasive knotweeds are resilient weeds that cannot be controlled by herbicide in a single year – any treatment strategy should be long-term and target both the above ground and extensive below ground parts of the plant.

• Don’t undertake treatment methods which are ineffective and risk spreading invasive knotweeds further. Physical control methods were shown by Jones et al. (2018) to be the least effective of the treatments tested and were also the most likely to result in further spread. Physical control methods include: cutting using hand tools, strimmer, mower, flail, thrasher; pulling; surface covering with geomembrane/geotextile; composting and burning.

• Don’t try digging out the knotweed yourself, it is easy to miss parts of the rhizome and spread it and you cannot dispose of this plant material along with your garden waste – in fact, it is illegal to do this.

• Don’t use unsuitable herbicides – results of the Jones et al. (2018) research showed that of the herbicide products currently available, glyphosate applied at the time when invasive knotweeds are most vulnerable to its effects is the most effective control treatment. Anyone using professional herbicides must hold a recognised professional training certificate.

• Don’t use animals to control knotweed by grazing – previous research has shown that this does not control invasive knotweeds.

• Don’t try untested methods of control – these do not work, but are likely to make the problem worse.

Contractor accreditations
When looking for a contractor, the following accreditations and registrations are recommended:

• Amenity Forum Membership
• BASIS Professional Register
• BASIS Amenity Training Register
• BASIS Nominated Storekeeper (NSK) Professional Register

Membership of one of the following trade associations is recommended:

• Property Care Association (PCA)
• Invasive Non-Native Specialists Association (INNSA)
**Don’ts and Do’s of knotweed treatment**

**Do’s**
- Ignore the hysteria — Jones et al. (2018) showed that knotweed can be controlled using glyphosate at the right time of year, though this can usually take three to five years.
- For control and management of invasive knotweeds, based on the research by Jones et al (2018), it is recommended to use one of the following control methods:
  1. **Biannual foliar spray** – half of maximum permitted application rate (see product label) applied twice per year.
  2. **Stem injection** – maximum permitted stump treatment application rate (see product label) applied once in the first year of treatment; however, it used significantly (15 times) more herbicide than either foliar spray treatment.
  3. **Annual foliar spray** – maximum permitted application rate (see product label) applied once per year; performed almost as well as biannual foliar spray and stem injection, but significantly less labour intensive and more sustainable in the long term.

**What does knotweed treated with herbicide look like?**
Images I-K below show what deformed Japanese knotweed regrowth looks like following treatment with glyphosate-based herbicides.

---

**Copyright statement**
Images contained in this document are copyright of Advanced Invasives Ltd - © Advanced Invasives Ltd | 2020. All rights reserved. Any redistribution or reproduction of images contained in this document in any form is prohibited other than the following:
- you may print or download images to a local hard disk for your personal and non-commercial use only
- you may copy the content to individual third parties for their personal use, but only if you acknowledge this document as the source of the material

You may not, except with our express written permission, distribute or commercially exploit the images. Nor may you transmit or store the images in any other website or other form of electronic retrieval system.

**This information leaflet has been produced for the Welsh Government by Advanced Invasives Ltd**

**Cite as:**

**Sources cited**