

Update on *D. micans* and the *R. grandis* breeding programme

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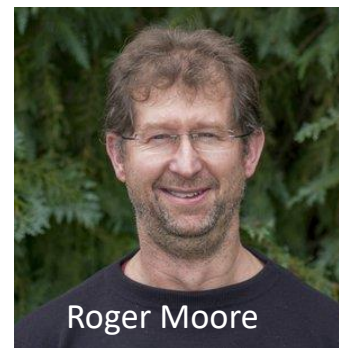
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Great spruce bark beetle

Dendroctonus micans

(Coleoptera: Curculionidae: Scolytinae)



- Breeds under bark of living trees, heart wood undamaged, but large populations can kill trees
- Eggs laid in tree cambium, groups of 50-80, c.300 per female
- Gregarious larval feeding (side-by-side)



- Larval feeding compromises tree phloem
- Tree weakened - more susceptible to further attacks / mortality



- Life-cycle: 12–18 months in UK
- Continuous: possible to find any stage at any time of year
- Immobile pupae; aggregations of adults on emergence

- 6–8 mm long, 2.5–3 mm wide.
- Large size (for a bark beetle!) enables females to withstand resin flow, single female can colonise tree unlike other ‘mass attack’ bark beetle strategies
- Not very mobile in (normal) UK climate: mostly crawl within and between trees ($>12^{\circ}\text{C}$), occasionally fly ($>20^{\circ}\text{C}$)
- Sibling mating (far fewer males than females)



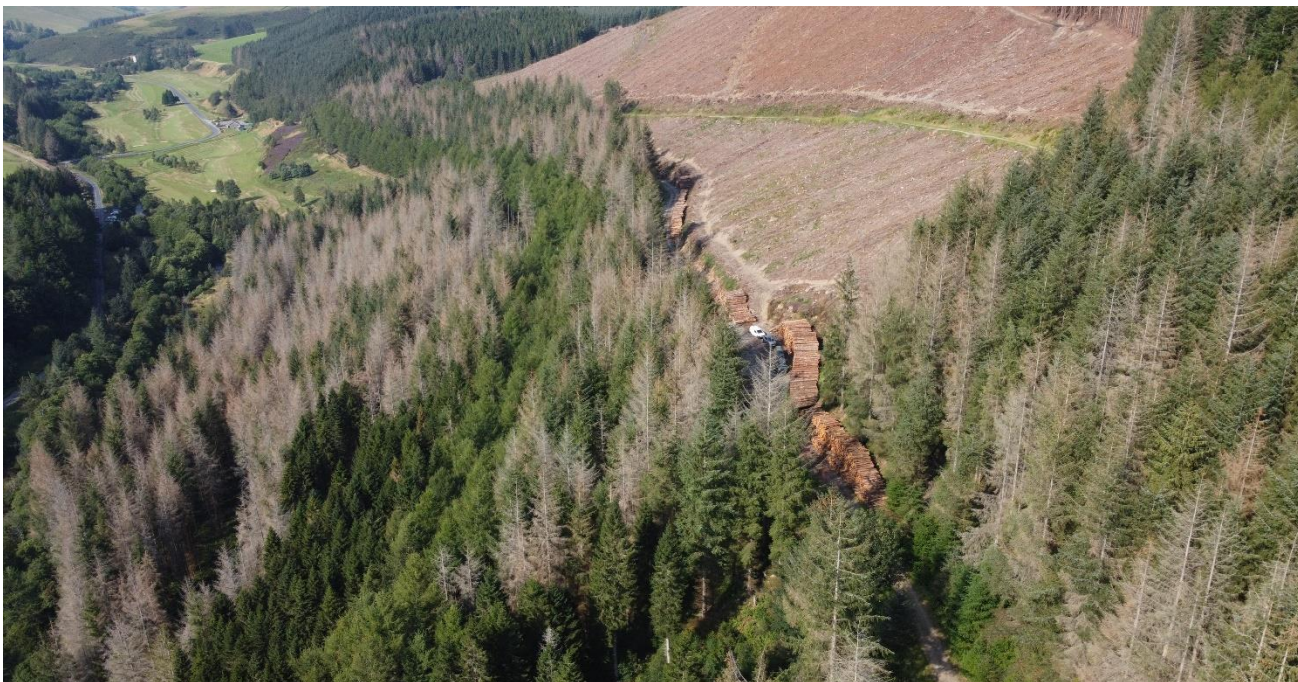
- Small groups of dead/ dying trees
- Dead or brown crown/ branches
- Resin tubes/ bleeds on tree trunk
- Quilted/ packed frass under bark
- *D. micans* and / or *R. grandis* present

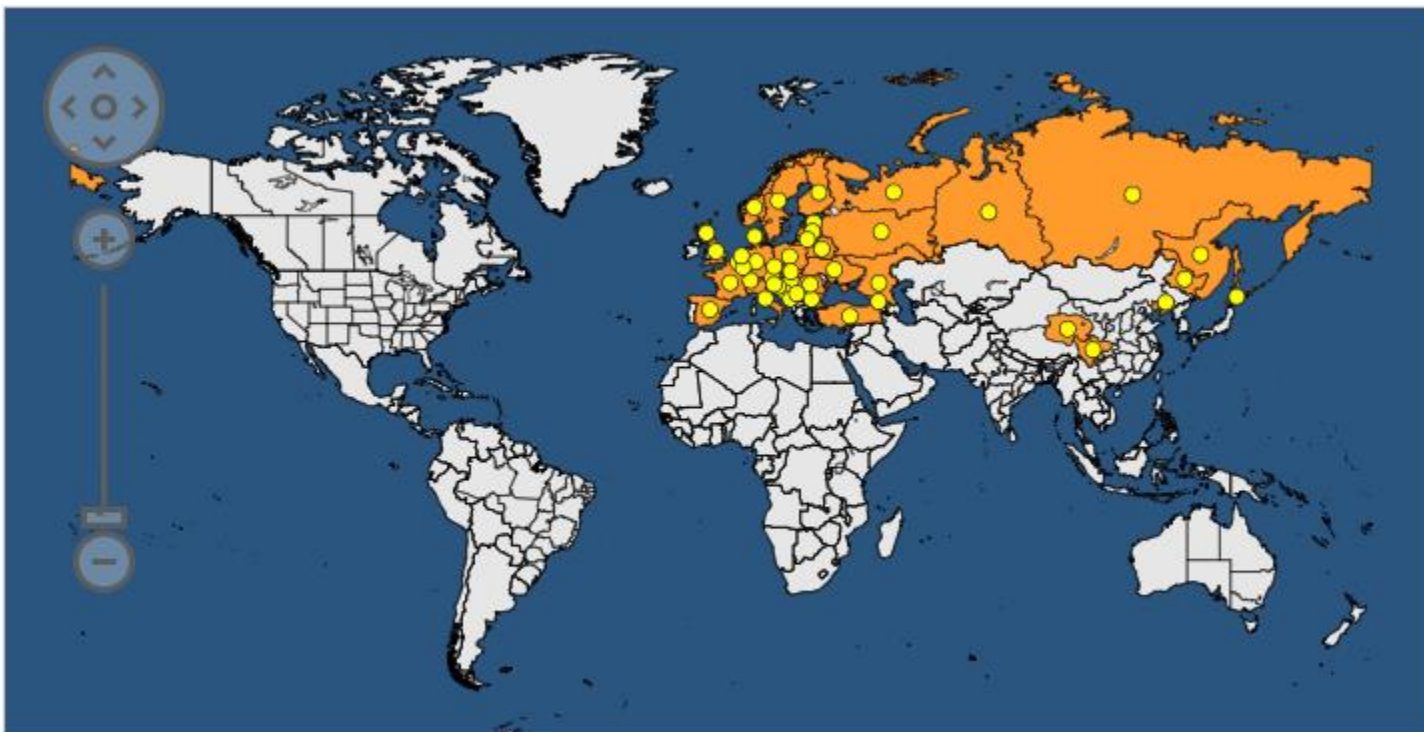


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- Attacks all spruce species including two principle UK forestry species (Sitka and Norway spruce (*Picea sitchensis*, *P. abies*)).
- Biocontrol programme keeps tree mortality low in healthy stands
- BUT – evidence of high mortality in stands stressed by other factors (e.g. drought)





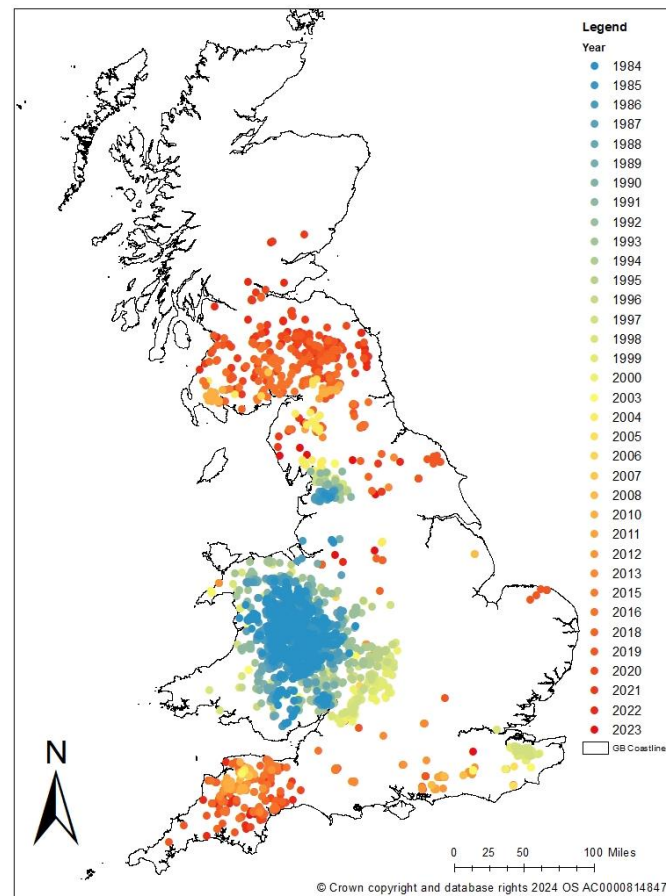
Source: EPPO, 2025

Native to the coniferous forests of Europe and Asia, spread west over last 100yrs

D. micans timeline:

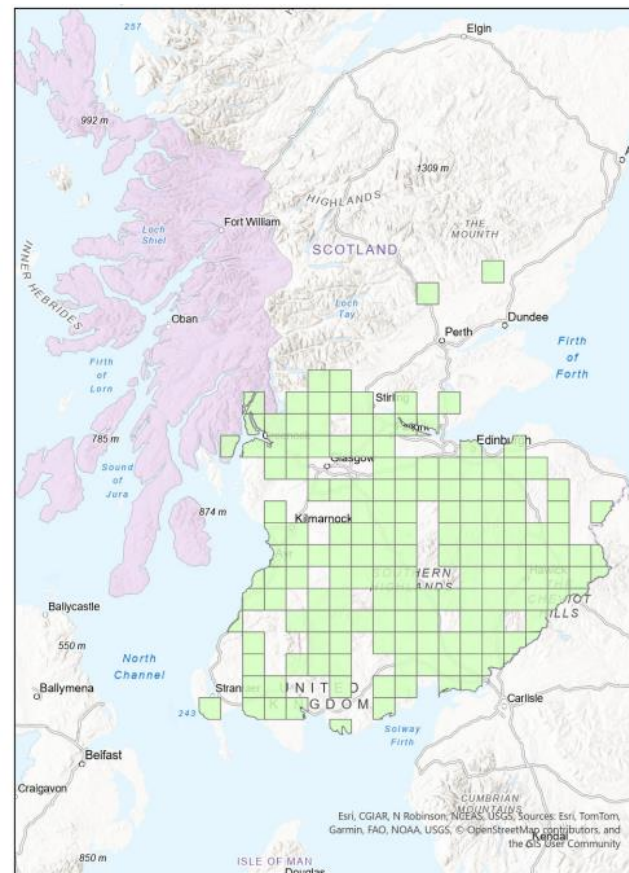
- 1982: detected
- 1973: estimated arrival (backdated)
- 1990's: expanded beyond Welsh border
- 2003: first found in Lake District and southwest Scotland
- 2025: First confirmed finding within designated Scottish pest free area (PFA)

R. grandis releases 1984 – 2023.
Source: FR, 2025



- *D. micans* has spread east and north since 2003
- 2005 – 2025 pest-free area designated in West Scotland (enables the export of conifer roundwood to the island of Ireland)
- 2025: first finding within PFA (export of timber to island of Ireland ceased)

Map of 10km grid squares (green) where *R. grandis* has been released in Scotland (based on positive *D. micans* findings). PFA in purple. Source: FR, 2025



Reduce risk:

Match tree species to site conditions

Minimise physical damage

Monitoring and surveillance – early detection and action is key

Manage pest:

Identify susceptible trees

Report suspected sites:

- TreeAlert reporting tool <https://treealert.forestresearch.gov.uk/>
- Email (nrs_entomology@forestresearch.gov.uk)

Encourage natural enemies (e.g. Great spotted woodpecker)

Remove infested trees – thinning / sanitation felling

Biological control



Rhizophagus grandis (Coleoptera: Monotomidae)

- Species-specific predatory beetle
- Larvae feed on *D. micans* larvae
- Found across *D. micans* range



- *R. grandis* first released in UK in 1984
- License granted quickly as species-specific
- FR breed and release beetles (at NRS since 2017)
- Breeding method developed/ refined over 30+ years
- Ongoing strategy of 'classical' biological control
- Aims:
 - Reduce *D. micans* populations
 - Slow the spread (not eradication)
 - Reduce tree mortality



Start with *D. micans* larvae and *R. grandis* adults



- Plus sawdust, bark and maggots
- Produce 2,000-3,000 adults/ year
- Breeding process takes 75-100 days



- Release x25 adults per site at base of infested *D. micans* tree
- Release at public and private sites
- Approx. 2,500 *R. grandis* released annually (c.100 sites, GB-wide)
- Priority area (central Scotland above) - all confirmed sites
- South Scotland (D&G, Borders) and England / Wales:
 - Sites further than 5km from recent (last 3 years) release
 - Specialist sites (e.g. botanic gardens / seed orchards)



Breeding programme and R. grandis releases: c.£45K / year

Funded by:

- Scottish Forestry
- Forestry and Land Scotland
- Forestry England
- Private sector (via Confor)



Does not include:

- Surveys (Scottish Forestry and Forestry Commission) c. £200k / year
- Research (Various projects)

Confor fund: If you or your organisation would like to contribute to the programme you can contact Richard Hunter (richard.hunter@confor.org.uk) to donate.

Sonja Steinke, Molly Davidson, Nick Fielding, FR Entomology team; FR Field Data Services (formerly TSU); Scottish Forestry, Forestry and Land Scotland, Forestry Commission, Forestry England, Natural Resources Wales, Confor.

