

Appendix 1C
Progressive Control Pest Plant Information Sheets

Asiatic Knotweed

Botanical Name

Reynoutria japonica

Family

Polygonaceae

Where is it originally from?

Asia

What does it look like?

Many-stemmed, thicket-forming perennial shrub (<1-2 m high) with roots with rhizomes and numerous, zigzagging, hairless, bluish to reddish stems (<15 mm diameter) that are woody at the base. Ovalish, pointed leaves (8-23 x 5-17 cm) with less than 14 pairs of lateral veins are bluish below and on dark crimson stalks. White flowers (<2.5 mm long) in densely-hairy, branched hanging clusters (<6 cm long) appear from December to April and are followed by glossy brown nuts (3 mm).



Are there any similar species?

Reynoutria sachalinensis

Why is it a pest?

Grows rapidly and extensively from rhizomes and multiple stems. Produces relatively long-lived and well dispersed seed and tolerates wet to moderately dry conditions, warm to cold temperatures, but is intolerant of shade.

How does it spread?

Seed and rhizomes are spread by soil and water movement.

What damage does it do?

Forms dense, long-lived thickets, excludes other species and prevents native seedlings establishing.

Which habitats is it likely to invade?

Shrubland and areas around waterways.

What can I do to get rid of it?

1. Dig out small patches (all year round). Dispose of at refuse transfer station or burn.
2. Weed mat: leave for 6 months minimum. Dig or spray surviving shoots.
3. Stump swab (all year round): glyphosate (250ml/L) or metsulfuron-methyl 600g/kg (5g/L) or triclopyr 600 EC (200ml/L).
4. Stem injection (all year round): metsulfuron-methyl 600g/kg (50g/L, 5ml per stem).

5. Spray (spring-autumn): glyphosate (200ml/10L) or metsulfuron-methyl 600g/kg (5g/L) or Tordon Brushkiller (6ml/L) or triclopyr 600 EC (6ml/L). Add penetrant

What can I do to stop it coming back?

Stem fragments and rhizomes resprout. Seeds germinate in bared areas. Difficult to control. Follow up 3-monthly for at least two years until eliminated.



Banana Passionfruit

Botanical Name

Passiflora 'Tacsonia' subgroup

Family

Passifloraceae (passionfruit) family

Also known as

Banana passion flower, wild blue-crown, wild passion vine. Both spp virtually identical in appearance and characteristics.

Where is it originally from?

Latin America

What does it look like?

Vigorous, evergreen, high-climbing vines (<10 m) with long, densely hairy stems which are angular when young, and which have many spiralling tendrils. Leaves are 3-lobed (each lobe 5-14 cm long) with middle lobe the longest, edges serrated, and undersides covered in down. From Jan-Dec pink hanging flowers (7 cm diameter) with central tube (60-95 mm long) appear, followed by hanging, thin-skinned fruit (7- 12 x 2-4 cm) ripening from green to yellow or orange, with sweet edible orange pulp and dark red seeds (4-6 mm long).



Are there any similar species?

P. pinnata stipula, *P. antioquiensis*, *P. caerulea* (qv), *P. edulis* (qv).

Why is it a pest?

Grows to medium-high canopy, where it forms large masses. Grows rapidly in most soil types, and produces highly viable seed in 2 years. Partly tolerant to shade, damage and drought, and stems root where they touch the ground.

How does it spread?

Birds, feral pigs and possums carry seeds some distance. Also humans (via eating or discarded fruit). Hedges, orchards, exotic plantations, waste land, gardens, roadsides.

What damage does it do?

Smothers canopy, prevents recruitment. Allows faster-growing or tougher vines to succeed it in dominating canopy. Appears in light wells away from parent plant.

Which habitats is it likely to invade?

Disturbed and open forest, light wells and margins of intact bush, streamsides, coastline, cliffs, consolidated sand dunes, inshore islands.

What can I do to get rid of it?

1. Pull roots up (all year round). Cut off above ground or tie stems in air to prevent layering.
2. Cut trunk and paint stump (all year round): cut trunk near to the ground, and swab freshly cut stump with metsulfuron-methyl 600g/kg (1g/L); or Tordon BK (100ml/L); or triclopyr 600g/L (100ml/L); or Banvine (200ml/L).

Roots normally easy to pull out. Use herbicide only when roots cannot be pulled.

What can I do to stop it coming back?

Roots normally easy to pull out. Use herbicide only when roots cannot be pulled.



Blue Morning Glory

Botanical Name

Ipomoea indica

Family

Convolvulaceae family

Also known as

Blue dawn flower, blue bindweed, blue convolvulus, morning glory, *I learii*, *Ipomoea congesta*

Where is it originally from?

Throughout tropical areas



What does it look like?

High climbing vine with tough, hairy, twining, running stems with tough fibrous roots without rhizomes. Leaves (5-18 x 5-16 cm) are usually 3-lobed and silky-hairy underneath. From late spring to early winter, groups of 3-12 deep blue-purple flowers that are pink at the base and wither in the midday sun are produced. Little or no seed is produced in New Zealand.

Are there any similar species?

Exotic species: Purple morning glory (*I. purpurea*) has violet-purple flowers (5-6 cm diameter), sets viable seed but is uncommon (only found in Napier, Christchurch and one site in the Bay of Plenty to date). Great bindweed (*Calystegia silvatica*) has long, extensive rhizomes, arrow-shaped leaves, large white flowers and is common, especially in Canterbury. Also similar is field bindweed (*Convolvulus arvensis*). Native species include: railway creeper (*I. cairica*, *I. palmate*) which has leaves divided into 5-7 finger-like lobes, mauve flowers 5-8 cm diameter, grows in coastal areas and is uncommon, pink bindweed or convolvulus (*Calystegia sepium*) which has extensive rhizomes, arrow-shaped leaves, flowers pink with white stripes, and is very common, shore bindweed (*Calystegia soldanella*) which is usually prostrate, has smaller, thick, semi-succulent leaves, 3-5 cm pink flowers, and is coastal, and *Calystegia tuguriorum* which has slender, much branched, climbing stems, roundish or kidney-shaped leaves, flowers white or pink, 4-6 cm diameter, and grows in lowland forest margins all over New Zealand.

Why is it a pest?

Very fast growth rate, longevity, dense smothering habit and ability to climb to top of high canopy makes this the dominant vine wherever it occurs. Tolerates hot to cool temperatures, and damp to dry conditions.

How does it spread?

Creeping stems spread this plant locally, and stem fragments are moved in dumped vegetation. Sources are gardens and wasteland.

What damage does it do?

Climbs over all other species, ultimately killing them. Can replace forest with low weedy blanket, and is the last species in many cases when a bush area totally succumbs to weeds.

Which habitats is it likely to invade?

Most warmer habitats except swamps and coastline.

What can I do to get rid of it

1. Hand pull, dig out roots (all year round). Dispose of roots and stems at a refuse transfer station or bury deeply.
2. Cut down and paint stump (all year round): glyphosate (100ml/L) or metsulfuron-methyl 600g/kg (1g/L).
3. Cut vines at waist height (summer-autumn) and spray foliage below: glyphosate (10ml/L + penetrant) or metsulfuron-methyl 600g/kg (2g/10L + penetrant (knapsack) or 20g/100L + penetrant (spraygun)). Follow up to check that slashed stems have not resprouted.

What can I do to stop it coming back?

Slashed stems resprout. Cut plant material can reprot. Eliminate from bush edges and dumps. Limited follow-up required.



Chocolate Vine

Botanical Name

Akebia quinata

Family

Lardizabalaceae

Also known as

Rajania quinata

Where is it originally from?

Central China to Korea and Japan



What does it look like?

Deciduous, twining climber and vigorous groundcover that can be evergreen in mild climates. Slender, round stems are green when young and brown when mature. Leaves made up of five or less oval leaflets (3-6 x 2-4 cm) creating a hand shape are on long stalks (up to 12 cm) and have a purplish tinge that becomes blue-green at maturity. Flowers (25 mm across) are chocolate-purple coloured with the scent of vanilla, and hang in clusters (5-10 cm long) of 6-8 flowers from August to October. Fruits are purple-violet, flattened sausage-like pods (8-9 cm long). The inside of the pod has a whitish, pulpy core with many tiny black seeds. Its weedy ways mean that it has recently been banned from sale, propagation and distribution within New Zealand.

Are there any similar species?

Alternatives: Try the native jasmine, akakiore (*Parsonsia heterophylla*) or kohia (*Passiflora tetrandra*). For non-native alternatives, try the attractive purple coral pea (*Hardenbergia violacea*) or Chilean jasmine (*Mandevilla laxa*).

Why is it a pest?

Chocolate vine grows very rapidly, producing so many stems that it forms a thick, tangled mat that covers other plants. It will form a thick groundcover if it doesn't have anything to grow up, smothering seedlings and stopping other plants establishing. It spreads by stem fragments, and birds also spread the seed. Tolerates a wide range of conditions from full sun to shade, drought and frost, sandy to clay soils, and acid or alkaline soils.

How does it spread?

Predominantly vegetative spread, growing up to 6-14m in a single growing season, plus bird-dispersed seed.

What damage does it do?

Quickly smothers, outcompetes and kills herbs and seedlings, shrubs and young trees. Once established, its dense growth prevents seed germination and establishment of seedlings of native plants.

Which habitats is it likely to invade?

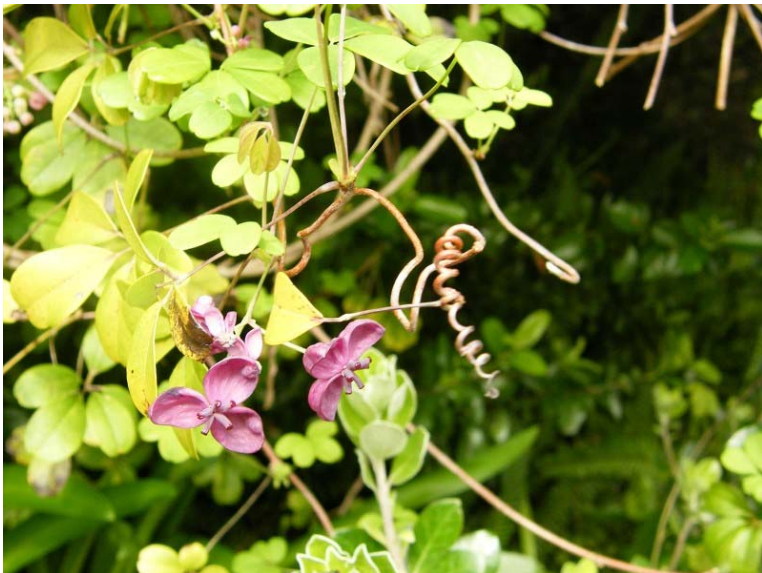
Prefers partial shade and well-drained yet moist soil, such as in riparian zones, forest edges, wetlands and urban areas.

What can I do to get rid of it?

1. Dig out individual vines and hand pull seedlings (all year round): remove root system, dispose of material at refuse transfer station.
2. Cut stems (spring-summer): cut at ground level, then repeat throughout growing season.
3. Overall spray large infestations (spring-summer): knapsack spray with glyphosate (300ml/15L + penetrant) or triclopyr 600 EC (60ml/10L+ penetrant).

What can I do to stop it coming back?

Monitor the site and treat regrowth from roots and seedlings. Search out and remove the source of the infestation. Where appropriate replant the site with local native species.



Darwin's Barberry

Botanical Name

Berberis darwinii

Family

Berberidaceae (Barberry)

Where is it originally from?

Chile and Argentina

What does it look like?

Evergreen, spiny, yellow-wooded shrub (< 4+ m tall) with tough, woody and densely hairy stems with tough, 5-pronged, needle-sharp spines. Hairless, glossy, dark green leaves (10-30 x 5-15 mm) are usually spiny-serrated along edges. Hanging clusters (7 cm long) of deep orange-yellow flowers (5-7 mm diameter) appear from July to February followed by oval purplish-black berries (5-7 mm diameter) with a bluish-white surface.



Are there any similar species?

European barberry (*B. vulgaris*) is deciduous and has red berries. *B. souliena*, *B. wilsonae* are both cultivated. Barberry (*B. glaucocarpa*) has paler yellow flowers and less glossy leaves.

Why is it a pest?

Long-lived plant, with well-dispersed seeds. Tolerates moderate to cold temperatures, damp to dry conditions, high wind, salt, shade, damage, grazing (not browsed), and a range of soils.

How does it spread?

Birds and possibly possums eat the berries containing the seeds. Occasionally spread by soil and water movement.

What damage does it do?

Scattered plants (occasionally dense stands) replace shrubland and regenerating forest, sometimes permanently in open habitats.

Which habitats is it likely to invade?

Disturbed forest and shrubland, short tussockland, herbfield, and bare land.

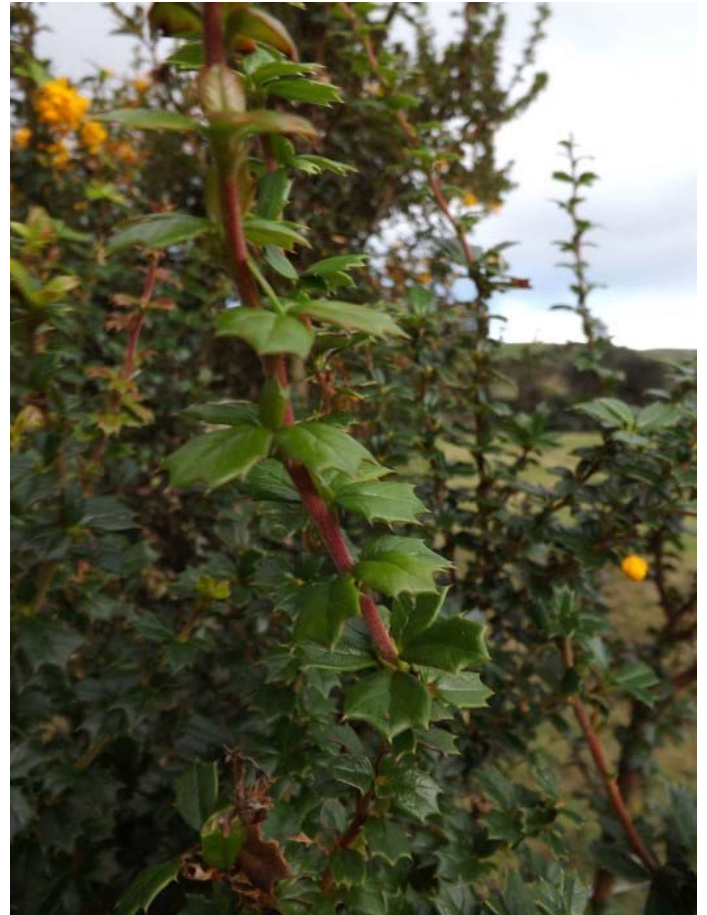
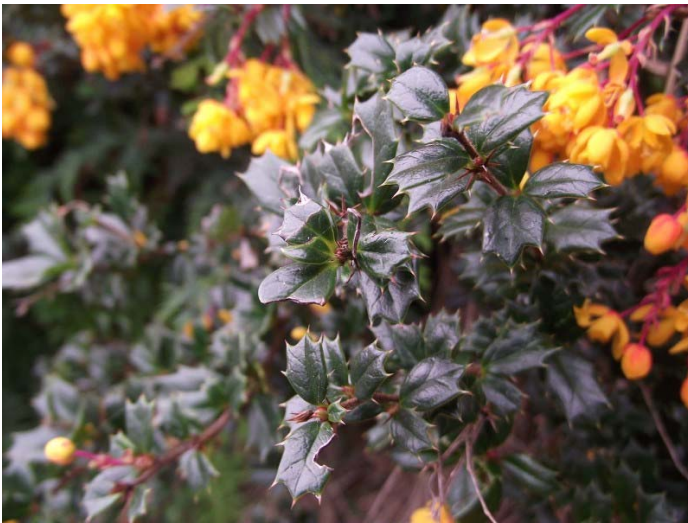
What can I do to get rid of it?

1. Grub out (all year round). Leave on site to rot down.

2. Stump swab (all year round): glyphosate (200ml/L) or metsulfuron-methyl 600g/kg (5g/L) or picloram gel or Tordon Brushkiller (100ml/L) or triclopyr 600 EC (200ml/L).
3. Cut and squirt (all year round): metsulfuron-methyl 600g/kg (1g/100mm stem diameter).
4. Spray (spring-autumn): metsulfuron-methyl 600g/kg (5g/10L) or Tordon Brushkiller (25ml/10L).

What can I do to stop it coming back?

Cut stumps resprout quickly, and can be hard to kill and seeds will germinate onto bare land. Follow up 6 monthly. Replant bare sites to minimise seeding.



Elaeagnus

Botanical Name

Elaeagnus x reflexa

Family

Elaeagnaceae family

Also known as

Elaeagnus hybrid, Elaeagnus pungens, Elaeagnus glabra, Elaeagnus 'variegata'

Where is it originally from?

Thought to be from Japan



What does it look like?

Vigorous, dense, evergreen shrub, scrambling over support to 20 m tall, with a very tough, suckering rootstock. Stems are long, arching, tough, with young shoots being brown and scaly and older stems often with spines. Leaves (45-90 x 15-40 mm) are arranged alternately on the stems, are hairless above, and silvery or brownish-scaly (often densely) underneath. Small drooping clusters of tiny, whitish, fragrant flowers are sometimes present from March to May followed by a pale reddish-orange fruit (18 x 10 mm) containing one ribbed seed.

Are there any similar species?

Not in the wild.

Why is it a pest?

Scrambling habit, suckering roots, layering stems, nitrogen fixing ability, extremely long-lived and not grazed. Tolerant of drought, wet, high to medium-low temperature, wind, salt, most soil types, and moderate shade.

How does it spread?

Birds, and possibly possums and goats, spread the very rare seed which most plants never produce. Layering stems and suckers are spread in dumped vegetation. Common sources are old homestead and farm sites, roadsides, hedges, and tips.

What damage does it do?

Slowly smothers all other plants to canopy height, invades well-lit or partially shaded sites, and can increase soil nutrient status, affecting which native plant species can grow there.

Which habitats is it likely to invade?

Forest margins, consolidated sand dunes, shrubland, cliffs, and fernland.

What can I do to get rid of it?

1. Dig out with machinery wherever possible. Dry and burn roots and stems or bury deeply.
2. Stump swab (ground level): glyphosate (250ml/L) or undiluted Tordon Brushkiller or Vigilant gel. Follow up likewise on suckers. Dispose of cut stems at a refuse transfer station, burn or bury deeply to prevent resprouting.
3. Injection (best in autumn): drill holes sloping into the sapwood at regular intervals around the tree. As each hole is drilled place glyphosate (250ml/L) or metsulfuron-methyl 600g/kg (20g/L) or undiluted Tordon Brushkiller into the hole. If necessary wait until the liquid subsides then apply the remainder. Repeat treatments may be necessary.
4. Frilling: use a sharp chisel or axe and make deep cuts into the sapwood at regular intervals around the base of the tree, taking care not to ring-bark the plant. Immediately apply glyphosate (250ml/L) or undiluted Tordon Brushkiller to the cuts using a paintbrush or a squeeze bottle.
5. Slashing or use a chainsaw to cut all growth down to ground level. Cut all the bark off the stumps and paint liberally with glyphosate (250ml/L) or undiluted Tordon Brushkiller and cover the stumps with sacking or black plastic to block out all of the light. Dispose of cut stems at a refuse transfer station, burn or bury deeply to prevent resprouting.
6. Spray: glyphosate (300ml/15L (knapsack) or 2L/100L (spraygun)) or metsulfuron-methyl 600 g/kg (5g/10L on small plants and regrowth) or Tordon Gold (12ml/L). Treatment may need to be repeated.

What can I do to stop it coming back?

Stumps resprout, roots sucker and cut stems can layer. Extremely hard to kill, repeat treatments needed.



Giant Knotweed

Botanical Name

Reynoutria sachalinensis

Family

Polygonaceae

Where is it originally from?

Asia



What does it look like?

Giant, many-stemmed, thicket-forming perennial shrub (<2-4 m high) with roots with rhizomes and numerous hairless green stems (<20 mm diameter) that are woody at the base. Ovalish and pointed leaves (10-30 x 5-22 cm) with more than 14 pairs of lateral veins that are bluish below and usually on reddish stalks. White or greenish flowers (<2mm long) in densely-hairy, clusters (<6 cm long) appear from November to April but no seed is seen in New Zealand.

Are there any similar species?

Reynoutria japonica

Why is it a pest?

Grows extensively from rhizomes and multiple stems, tolerates wet to moderately dry conditions and warm to cold temperatures, but is intolerant of shade.

How does it spread?

Seed and rhizomes are spread by soil and dumping.

What damage does it do?

Forms dense, long-lived thickets, excludes other species and prevents native seedlings establishing.

Which habitats is it likely to invade?

Disturbed shrubland and bare land.

What can I do to get rid of it?

1. Dig out small patches (all year round). Dispose of at refuse transfer station or burn.
2. Weed mat: leave for 6 months minimum. Dig or spray surviving shoots.
3. Stump swab (all year round): glyphosate (250ml/L) or metsulfuron-methyl 600g/kg (5g/L) or triclopyr 600 EC (200ml/L).
4. Stem injection (all year round): metsulfuron-methyl 600g/kg (50g/L, 5ml per stem).

5. Spray (spring-autumn): glyphosate (200ml/10L) or metsulfuron-methyl 600g/kg (5g/L) or Tordon Brushkiller (6ml/L) or triclopyr 600 EC (6ml/L). Add penetrant

What can I do to stop it coming back?

Difficult to control as stem fragments and rhizomes resprout. Follow up 3-monthly for at least two years until eliminated



Gunnera

Botanical Name

Gunnera tinctoria/ manicata

Family

Gunneraceae family

Also known as

Brazilian rhubarb, Gunnera chilensis, G. scabra, gunnera, giant rhubarb

Where is it originally from?

South America

What does it look like?

Large, clump-forming, summer-green herb (up to 2m) growing from stout



horizontal rhizomes. Massive, rough and wrinkled umbrella-sized leaves (80 cm x 1 m) on sturdy stalks have 5-7 lobes and raised veins beneath. Both leaves and leaf stalks are covered in rubbery red prickles. Dies down over winter in cold climates and grows new leaves in spring from large, lobed, scaly buds (25 cm long) that are pinkish-green when fresh and dry to brown. Tiny, densely packed green flowers (summer) on long, erect, conical spikes (up to 1 m long) rising from the base of the leaves develop into reddish, oblong fruit (1.5-2mm long), each containing a single oblong seed.

Why is it a pest?

Grows into large plants that form dense colonies, and large leaves shade out and suppress native vegetation. Produces an abundance of viable seed (approximately 250,000 seeds in a year) and also spread by rapid rhizome growth, making it difficult to control.

How does it spread?

Seeds are spread by water and by birds. Spreads vegetatively by growth of rhizomes and regrowth from rhizome fragments.

What damage does it do?

Alters the habitat of birds, insects and lizards, can block drains and streams and obstruct access to natural and recreational areas, and contribute to erosion on slip-prone banks.

Which habitats is it likely to invade?

Requires moist soil and full sun to dappled shade in habitats such as coastal cliffs, forest, forest edges, river and stream banks, drains and wetlands.

What can I do to get rid of it?

1. Remove flower spikes and dispose at landfill (all year round).
2. Pull out seedlings (all year round).
3. Dig out individual plants or small patches (all year round). Ensure removal of all rhizome fragments and flower/seedheads and dispose of these at a refuse transfer station.
4. Cut and paint (spring): cut off the leaves and paint the stalk stumps with picloram gel or glyphosate (250ml/L)

5. Spray (full leaf and actively growing): glyphosate (10ml/L (knapsack))



Himalayan Honeysuckle

Botanical Name

Leycesteria formosa

Family

Caprifoliaceae family

Where is it originally from?

Himalayas

What does it look like?

Deciduous or semi-evergreen, many-stemmed perennial shrub to 2+ m with straight, hairless round stems (1-2 cm thick) that are hollow and green when young but become woody.

Heart-shaped (occasionally 5-9 lobed) leaves (4-14 x 2-8 cm) are in opposite pairs on the stem. Terminal, drooping spikes (3-8 cm long) of white funnel-shaped flowers (15 mm long) with delicate deep reddish-purple bracts appear from December to May, followed by juicy, dark brownish-purple berries (7-10 mm diameter).



Why is it a pest?

The few seeds it does produce are well dispersed by birds and water, and new plants quickly form dense thickets. It colonises light wells, slips and other gaps, quickly replacing native species that are trying to establish and causing invasion by other exotic species, especially vines by getting rid of native competition. Tolerates moderate to deep shade, frost, damage, damp, and most soils. Not long-lived, so eventually succeeded by other species.

How does it spread?

Birds and water disperse seeds. Common seed sources include plantation forest, roadsides, disturbed bush, and under hedges.

What damage does it do?

Colonises light wells, slips and other gaps, quickly replacing native pioneer species. Causes invasion by other exotic species, especially vines.

Which habitats is it likely to invade?

Wet forest, shrublands and margins, streamsides, damp gullies, and possibly areas that would usually be dominated by epiphytes.

What can I do to get rid of it?

1. Dig out (all year round). Leave on site to rot down.
2. Cut down and paint stump (all year round): or glyphosate (100ml/L) or metsulfuron-methyl 600g/kg (1g/L) or triclopyr 600 EC (100ml/L) or triclopyr 120g/L (500ml/L).
3. Spray (spring-summer): metsulfuron-methyl 600g/kg (5g/10L) or triclopyr 600 EC (30ml/10L) or triclopyr 120g/L (15ml/L).

What can I do to stop it coming back?

Stumps resprout so frequent followup required to ensure eradication. Remove pigs and other stock to minimise erosion and the development of light wells. Replant sites where native species are slow to recover to prevent reseeding.



Japanese Honeysuckle

Botanical Name

Lonicera japonica

Family

Caprifoliaceae family

Where is it originally from?

Japan

What does it look like?

Vigorous evergreen (semi-evergreen in cold districts) climber with long, tough, wiry stems that twine clockwise, are purplish and hairy when young, and turn woody as they mature. Leaves (3-12 x 2-6 cm) are in opposite pairs on the stems, are shiny dark green (occasionally yellowish) on the top and lighter green underneath, and are wavy-edged to lobed when produced in cold climates, otherwise they are entire. Pairs of 2-lipped, sweetly scented tubular white flowers (2-5 cm long) that age to yellow are produced from September to May, and are followed by egg-shaped, glossy black berries (5-7 mm diameter) in colder parts of NZ, each containing seeds (2mm).



Are there any similar species?

Many similar *Lonicera* species are cultivated, and hybrids and cultivars of *L. japonica*. *L. pericyclamineum* and *L. x americana* are both found in the wild.

Why is it a pest?

Climbing, smothering habit. Forms dense, long-lived masses. Tolerates moderate-shade, frost, salt, damage, wet or dry, most soils, high to low temperature. Very long stems layer profusely, moderate-fast growth rate. Poor seeder.

How does it spread?

Birds, possibly possums. Roading machinery, dumped vegetation, soil and fill. Roadsides, wasteland, plantation forest, hedges, shelterbelts.

What damage does it do?

Climbs over and smothers most plants from ground to medium canopy. Can cause canopy collapse and subsequent invasion of grasses or ground vines. Provides support for faster growing weedy vines (eg morning glory, moth plant).

Which habitats is it likely to invade?

Forest margins, shrublands, disturbed forest, coastal areas, river systems, wetland margins, fernland, and inshore islands.

What can I do to get rid of it?

1. Dig out small sites (all year round). Dispose of roots and stems at a refuse transfer station, burn or bury deeply.
2. Cut and paint stump: within 10-15 minutes of cutting, paint cut surfaces with a liberal dose of triclopyr 600 EC (100ml/L) or Yates Woody Weedkiller (200ml/L).
3. Cut and paint stump (all year round): metsulfuron-methyl 600g/kg (5 g /L) or Tordon Brushkiller (200ml/L) or picloram gel. Leave vines in trees to die, dispose of cut stems at a refuse transfer station, burn or bury deeply.
4. Cut the vines at a convenient height in winter and spray the regrowth in the spring with glyphosate (10ml/L + penetrant) or metsulfuron-methyl 600g/kg (2g/10L + penetrant).
5. Spray (summer-autumn): glyphosate (10ml/L) or metsulfuron-methyl 600g/kg (5g/10L + penetrant) or clopyralid (50ml/10L) or Tordon Brushkiller (60ml/10L).

What can I do to stop it coming back?

Hard to kill. Stumps resprout, stems layer, but very shy seeder, so sites usually remain clear after treatment. Check for new sprouts 6-monthly until clear. Replant bared areas if seedlings are a problem.



Lagarosiphon

Botanical Name

Lagarosiphon major

Family

Hydrocharitaceae family

Also known as

Oxygen Weed

Where is it originally from?

South Africa

What does it look like?

Submerged, bottom-rooting perennial up to 5 m. Leaves (16 x 2 mm) have minute serrations along the edges, are arranged spirally around the stem, and are curved backwards or downwards. Tiny pinkish flowers are produced, but as only female plants are found in New Zealand, no seed is set.

Are there any similar species?

Egeria, Elodea, and Hydrilla are all similar.

Why is it a pest?

Grows rapidly in moderate to well-lit submerged sites ranging from low to high temperature, is tall, long-lived and dense, and overtops smaller native species. Lacks native plant competitors of similar height in New Zealand. Stems break easily, and fragments root downstream or wherever they are dumped.

How does it spread?

Loose stem fragments root at any node, colonising new sites. Lateral buds along the stems form new shoots and roots. Within catchments it spreads by water movement, and new catchments are infested by fragments spread by boats and trailers (occasionally motor cooling water), eel nets, diggers and people 'liberating' fish and emptying aquaria. Birds are unlikely to spread it.

What damage does it do?

Forms vast deep underwater 'meadows', shading out smaller native species, and preventing seedlings of native species from establishing. Large clumps dislodge from the 'meadows', causing flooding. Rotting vegetation turns water stagnant, killing fauna and flora.

Which habitats is it likely to invade?

Rivers, lakes, dunelakes and other still or slow-moving waterbodies with moderate to high light levels.



What can I do to get rid of it?

Infestations in small ponds can be controlled first by mechanical removal, ensuring no fragments are released, followed by bottom-lining. For larger infestations and infestations in flowing water, contact your regional council or local Department of Conservation office for advice.



Mile a Minute

Botanical Name

Dipogon lignosus

Family

Fabaceae family

Also known as

Wweet pea vine, pea vine,
Dolichos lignosus

Where is it originally from?

South Africa

What does it look like?

Evergreen, climbing vine with rounded, moderately hairy stems that are woody towards their base. Leaves are made up of three heart-shaped leaflets (25-55 mm long) that are not usually arranged in a flat plane. Pea-like white, lavender and white, or pink to reddish purple flowers (10-15 mm long) are produced from spring to summer, and develop into boat-shaped seed pods (30-40 mm long) that ripen and split to release the seeds.



Are there any similar species?

Only vine with pea-like flowers and trifoliate leaves.

Why is it a pest?

Mile-a-minute is a good description of how this weedy twining vine grows. It can rapidly smother low growing shrubs and regenerating native forest canopy, and eventually takes over completely, shading out the plants underneath. Birds can spread seeds when the plant is used as nesting material, and it is thought that the seed can also be carried by water. Particular problem along road and track sides, open scrubland, forest margins and along riverbanks and streams. Tolerates drought or damp conditions, wind, salt, poor soils, and damage, but is not shade-tolerant.

How does it spread?

Seeds drop near parent plants, but most is spread in dumped vegetation or soil and also by sea or fresh water. Gardens, roadsides, vacant land and hedges are all common sources.

What damage does it do?

Smothers and kills most plants from ground level to medium canopy and prevents the establishment of native plant seedlings. Thrives in bare sites and increased nitrogen in impoverished soil types may change the species that can grow there to a high-fertility weed community, to the detriment of specialised plants eg. orchids, ferns, herbs, and so on.

Which habitats is it likely to invade?

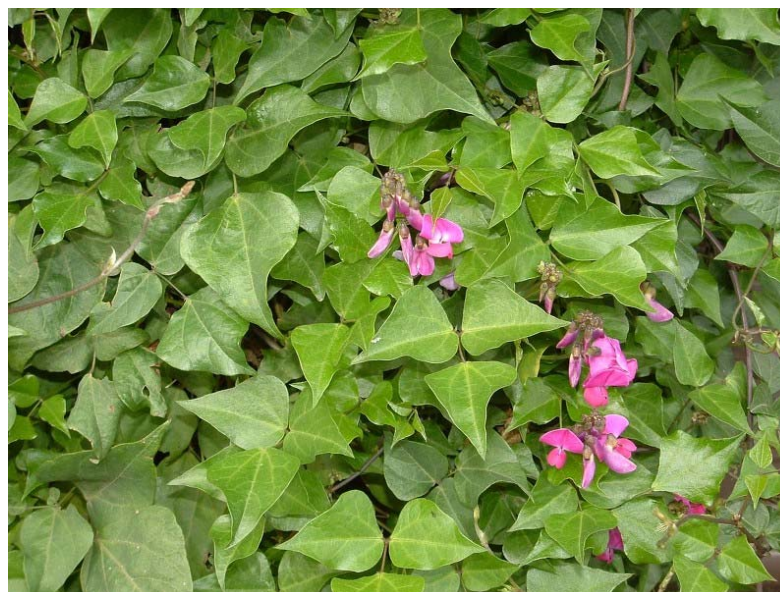
Forest margins, coastline, cliffs, shrublands, rocky and limestone areas.

What can I do to get rid of it?

1. Hand pull small plants (all year round). Dispose of at a refuse transfer station or burn.
2. Cut down and paint stump (all year round): metsulfuron-methyl 600g/kg (1g/L) or Tordon Brushkiller (100ml/L) or Banvine (200ml/L) or Woody Weedkiller (400ml/L) or Tordon Gold (200ml/L).
3. Dispose of all cut material at a refuse transfer station or burn.
4. Spray (spring-autumn): metsulfuron-methyl 600g/kg (3g/10L + penetrant (knapsack) or 20g/100L + penetrant (spraygun)) or Banvine (120ml/10L) or Woody Weedkiller (240ml/10L).

What can I do to stop it coming back?

Stumps resprout very quickly, cut stems root at nodes. Seeds produced in moderate quantities. Check at least 6-monthly for seedlings. Plant dense shading species immediately where possible.



Old Man's Beard

Botanical Name

Clematis vitalba

Family

Ranunculaceae family

Also known as

Travellers' joy, wild clematis

Where is it originally from?

Europe, South West Asia

What does it look like?

Deciduous, climbing, layering vine to 20 m tall with very long, woody stems with six prominent ribs (appear as furrows in older vines) and pale, easily rubbed-off bark. Leaves are arranged in opposite



pairs on the stems, and are made up of five (rarely three) widely spaced leaflets that fall in autumn. Thin, papery leaflets are sparsely hairy and have bluntly toothed or smooth edges. Creamy white, fragrant flowers (2-3 cm diameter) produced from December to May, followed by grey, hairy seeds (2-3 mm long) with distinctive white plumes (3-4 cm long) in dense, fluffy clusters persisting over winter (hence the 'old man's beard').

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Are there any similar species?

Native Clematis species, *C. paniculata* is a hardy climber with large white flowers, *C. marata* scrambles through shrubs with small yellow flowers, *C. foetida* has strong lemon-scented flowers. The native jasmine, *Parsonsia capularis*, is also lovely. Note all native clematis species are evergreen, have 3 leaflets (except the leafless *C. afoliata*), unfurrowed stems, and flower from August to December. All exotic species that are found in the wild are deciduous and flower from December to May (except the occasionally weedy, pink-flowered *C. montana* which flowers from October to December).

Why is it a pest?

Grows rapidly, forming dense, heavy, masses that dominate canopy of any height. Stems layer profusely, and it produces many long-lived seeds if exposed to frost. Tolerant of cold, moderate shade, damp, wind, salt, most soil types, and damage.

How does it spread?

Seed is spread by water or wind, and both seed and stem fragments are spread in dumped vegetation. Common sources are forests, roadsides, hedgerows, vacant land, and willow swamps.

What damage does it do?

Smothers and kills all plants to the highest canopy, and prevents the establishment of native plant seedlings. Moves readily into established forest over canopy and by layering.

Which habitats is it likely to invade?

Disturbed and open forest and forest margins, shrublands, riverbeds, cliffs, bush tracks, fernland, and tussockland.

What can I do to get rid of it?

1. Slash thick stems (all year round) at 1 m and ground level (to prevent stump resprouting and aerial roots attaching from hanging stems). Paint cut stumps with glyphosate (250ml/L) or metsulfuron-methyl 600g/kg (5g /L) or Tordon Brushkiller (100ml/L) or triclopyr 600 EC (100ml/L) or triclopyr 120g/L (500ml/L) or Banvine (200ml/L) or Yates Woody Weedkiller (400ml/L) or picloram gel. Leave stems in air to die. Dispose of cutaway segments at a refuse transfer station or by burning.
2. Spray (spring-autumn): glyphosate (20ml/L) or clopyralid (12.5ml/L).

What can I do to stop it coming back?

Stumps resprout very quickly and cut stems root at nodes. Replant bared areas promptly to minimise seedling regrowth. Check for seedlings at least 6-monthly.



Oxygen Weed

Botanical Name

Egeria densa

Family

Hydrocharitaceae family

Also known as

Lake weed, Elodea densa

Where is it originally from?

South America

What does it look like?

Submerged, bottom-rooting perennial, growing to 5 m. Slender, brittle, buoyant stems (3 mm diameter) are much-branched. Linear, dark green leaves (15-30 x 4 mm) are in whorls of 4-6 (occasionally 3 near base).

From November to January it produces flowers (20 mm diameter) that are white, 3-petalled with yellow stamens, and that sit on the surface of the water. As only male plants are found in New Zealand, no seed is set.



Are there any similar species?

Lagarosiphon, Elodea, Hydrilla are all similar.

Why is it a pest?

Grows in most still or slow-moving, highly lit submerged sites, and tolerates a wide range of temperatures. Stems break and fragments root downstream or wherever they are dumped. Grows rapidly and forms dense patches, is long-lived, and tall enough to overtop smaller native species; it lacks native plant competitors of similar height.

How does it spread?

Loose stem fragments root at any node, colonising new sites. Water flow spreads it within catchments, and new catchments are infested by fragments spread by boats and trailers (occasionally motor cooling water), eel nets, diggers, people liberating fish, and floods from ornamental ponds. Birds spread is not a factor.

What damage does it do?

Forms vast underwater 'meadows', shades out smaller native species, and prevents seedlings of native species establishing. Large clumps can dislodge from the underwater 'meadows', causing flooding. Rotting vegetation stagnates water, killing fauna and flora.

Which habitats is it likely to invade?

Rivers, lakes, dune lakes, and other waterbodies with moderate to high light and temperatures in the range of 10-25 degrees C.

What can I do to get rid of it?

In small ponds, this plant can be killed by first using mechanical clearance, taking care not to spread fragments, followed by bottom lining of the pond. For larger infestations or infestations in flowing water, contact your regional council or local Department of Conservation office for advice.



Pampas

Botanical Name

Cortaderia selloana / jubata

Family

Poaceae family

Also known as

Cutty grass, Prince-of-Wales feathers,

Where is it originally from?

South America

What does it look like?

Large-clump-forming grass to 4 m+. Leaf base is smooth or sparsely hairy, with no white waxy surface. Leaves are blueish-green above and dark green below, have a conspicuous midrib which does not continue into leaf base, no secondary veins between midrib and leaf edge, and snap readily when tugged. Dead leaf bases spiral like wood shavings. Erect, dense, fluffy, white-pinkish or purple flowerheads are produced from January to June which fade to a dirty white or purple as seed forms.



Are there any similar species?

Native *Cortaderia* species (toetoe) are similar. Toetoe leaves don't snap readily, midrib continues into leaf base, have distinct secondary veins between midrib and edge, and white waxy leaf sheaths. Dead leaves don't spiral. Drooping, light golden-yellow flowerheads are produced from September to January.

Why is it a pest?

Tolerates heat and frost, salt, wind, wet and drought, moderate-shade, most soils, low fertility, and recovers quickly after fire. Massive amounts of well dispersed seed are produced.

How does it spread?

Seeds are spread very long distances by wind and occasionally water. Seeds are also spread by soil movement, dumped vegetation, contaminated forestry machinery, clothing, and on animal pelts. Common seed sources are plantation forests, roadsides, farm hedges, quarries, and wasteland.

What damage does it do?

Colonises sprayed, burnt, slipped and otherwise disturbed sites and quickly becomes dense. Replaces groundcovers, shrubs, and ferns, creates fire hazards, provides habitats for possums and rats, and impedes access. Normally followed by weedy vines.

Which habitats is it likely to invade?

Forest light gaps, slips, margins, disturbed sites, open habitats, riverbeds, cliffs, inshore and offshore islands, tussockland, fernland, herbfield, duneland, coastline, gumlands, salt marsh, estuaries, and shrublands.

What can I do to get rid of it?

1. **Physical control:** Dig or grub out seedlings or small plants. Chainsaw small plants and remove sizeable plants by bulldozer. Compost or leave on site to rot down. Burn or bury any flowerheads.
2. **Weed wipe (all year round):** glyphosate (200ml/L + penetrant).
3. **Spray:** Gallant (150ml/10l + crop oil) for most sites or glyphosate (100ml/10L + penetrant) for very dense sites. Use a marker dye to avoid wastage and a foaming agent to help prevent spray drift. Leave the plants in the ground until the roots have died off.

What can I do to stop it coming back?

Seed banks reinfest bared, burnt and sprayed sites, and grazed plants resprout. Plan for increased fire risk after control. Pampas recedes as shade increases, so encourage weed replacement (planting, regeneration) as you carry out control. Follow up as needed, but do not reapply herbicide too soon after the initial treatment - wait until the plant actively begins growing again.



Parrots Feather

Botanical Name

Myriophyllum aquaticum

Family

Myriophyllaceae family

Also known as

Brazilian milfoil, water milfoil,
Myriophyllum brasiliense

Where is it originally from?

South America

What does it look like?

Bottom-rooted, perennial floating and emergent plant with stolons, fibrous roots, and stems (5 mm diameter) that grow to 2 m long (3-4 m in flowing water) emerging 10 cm above water and rooting at lower nodes, with submerged parts become bare. Feather-like blue-green leaves (25-45 x 7-15 mm) are in whorls of 5-6, and are each divided into 25-30 leaflets (7 mm long).

From September to February, minute female flowers are produced, but no seed is set in New Zealand.



Are there any similar species?

Hornwort (*Ceratophyllum demersum*) is similar.

Why is it a pest?

All nodes can take root and it forms mats in still or slow water or on damp ground. Prefers water that has high nutrient levels, high sediment levels (especially peat levels) and which is polluted, but tolerates damage, grazing, hot and cold temperatures and salt water at low levels.

How does it spread?

Within catchments it is spread by flowing water, and new catchments are infested by fragments spread by boats and trailers, eel nets, diggers, and people 'liberating' fish. Birds are unlikely to spread it.

What damage does it do?

Forms dense mats, shading out existing native species and preventing new seedlings of native species from establishing, and replaces species that usually grow on the margins

of waterbodies. Large clumps dislodge, causing flooding, and rotting vegetation stagnates water, killing fauna and flora.

Which habitats is it likely to invade?

Disturbed, polluted, high nutrient, well-lit, still or slow-moving waterbodies, as well as wetlands, water margins, streams, rivers, slightly saline estuary edges and river mouths.

What can I do to get rid of it?

1. Rake up (November-January): Leave on site to rot down. away from water, and then follow up from February to April by spraying any regrowth.
2. Weedmat: Lay carefully to ensure fragments are not released, start at top of infestation, leave 3-4 months.
3. Spray terrestrial sites (spring-autumn): glyphosate (20ml/L + penetrant) spray 4 times over a 10 or more week programme.
4. Lower water level, mechanically remove, use weedmat to cover the area or dry out thoroughly for 2-3 weeks.

What can I do to stop it coming back?

Plant trees adjacent to narrow waterbodies to create shade, create riparian strips, and remove pollution sources to prevent nutrient runoff.



Purple Loosestrife

Botanical Name

Lythrum salicaria

Family

Lythraceae family

Also known as

Bouquet-violet

Where is it originally from?

Europe and Asia

What does it look like?

Erect, hairy, summer-green perennial herb to 1-2 m (occasionally to 3m) with a taproot and fibrous roots that form dense surface mats and produce up to 50 stems per rootstock. Much-branched stems are 4-8 sided, pink at base and die off in winter. Narrow leaves (20-100 x 5-25 mm) are usually paired. From December to February a showy, densely hairy flowerhead spike (20-25 cm long) is produced, made up of purple-magenta flowers with 5-6 petals, which are followed by blackish seed capsules (3-5 mm long).



Are there any similar species?

No similar species grow this tall.

Why is it a pest?

Rapidly invades damp ground and shallow water. Overtops native species with dense bushy growth, is long-lived and produces millions of long-lived, highly viable seeds from an early age. Tolerates hot or cold conditions and low to high nutrient levels in the water, but is intolerant of salt water.

How does it spread?

Seed is spread by the movement of water and contaminated machinery, soil, livestock and hay.

What damage does it do?

Forms massive, tall, impenetrable stands, excluding all other species. Destroys wetland and marginal habitats and food sources for many fish and bird species, and causes blockages and flooding.

Which habitats is it likely to invade?

Invades wetlands, lakesides, streams, swamps, bogs that are damp in winter and drier in summer, and creeps onto dry margins.

What can I do to get rid of it?

Start control work at margins to prevent further seeding, and work downstream where possible.

1. Weedmat: kills whole patches. Start at top of infestation, leave 3-4 months.
2. Spray: glyphosate (10ml/L). Respray until eliminated.
3. Spray terrestrial sites: triclopyr 600 EC (30ml/10L) or triclopyr 120g/L (15ml/L). Follow up 3-monthly.
4. Lower water level if possible and mechanically remove.
5. Raise water level if possible for 2-3 weeks to drown the weed.

What can I do to stop it coming back?

Plant tall trees adjacent to infested margins to shade out weed, and deepen water if possible to prevent growth



Wild Ginger

Botanical Name

Hedychium gardnerianum /
flavescens

Family

Zingiberaceae family

Also known as

kahili ginger, ginger lily

Where is it originally from?

South Africa

What does it look like?

Non-woody perennial to 2 m tall, ginger-scented. Massive, taro-like rhizomes are long, shallow rooted, much-branched, growing over each other close to the ground surface, and form deep beds. Each rhizome segment (4 x 10 cm) usually produces an aerial stem annually. Soft, erect stems (to 2 m) are unbranched and thicken to a short pinkish 'collar' at the base. Shiny, slightly hanging leaves (20-45 x 10-15 cm) are alternate. Flowerheads (25-45 cm tall) with many fragrant, lemon-yellow flowers with conspicuous red stamens are produced from January to March and develop into a fruiting spikes with fleshy orange fruits (15-20 mm long) containing many bright scarlet seeds.



Are there any similar species?

Canna species, and Zingiber spectabile are similar. Alternatives: A couple of nice natives you could try instead are Parataniwha (*Elatosterna rugosum*) or Rengarenga lily (*Arthropodium cirratum*).

Why is it a pest?

Extremely shade-tolerant, tolerates most soil types, good or poor drainage and fertility, and is drought and frost tolerant once established. Long-lived, fast growing and forms deep rhizome beds. Moderate amount of seed produced that are dispersed widely, and rhizomes resprout from any fragment and can survive immersion in the sea, crushing, and years away from soil. Wild ginger can grow within native bush. Nothing can grow up through the mats of tubers, and the dense leaves block light and smother natives.

How does it spread?

Seeds are spread by birds and possibly possums. Rhizomes spread slowly outward from clumps, and new plants are established from rhizome fragments spread in dumped vegetation and fill, and by soil movement, flooding, and contaminated machinery.

What damage does it do?

Dense rhizome beds replace all other species, and are shallow rooted, so when they become heavy with rain they can slip on steep sites and streambanks, causing erosion. Succeeded only by weedy vines.

Which habitats is it likely to invade?

Most habitats except dry rocky areas: damp forest and margins, streamsides, river systems, shrublands, fernland, and inshore islands. It is frost-tender but grows under canopy in cool forests.

What can I do to get rid of it?

1. Cut down and paint stump (all year round): cut above pink 'collar' at base and apply glyphosate (250ml/L) or metsulfuron-methyl 600g/kg (1g /L). Leave stems and leaves on site to rot down.
2. Dig or pull out small plants (all year round). Don't compost, leave on site to rot down or hang rhizomes in trees, as they survive indefinitely. Dispose of rhizomes at a refuse transfer station or by drying out and burning.
3. Spray (all year round): metsulfuron-methyl 600g/kg (5g/10L knapsack). Add penetrant in winter. For dense patches keep spray away from roots of vulnerable plants. Don't replant sprayed sites for 6 months.

What can I do to stop it coming back?

Seeds survive for 2-4 years so it is possible to eliminate this plant from sites. Maintain rolling front and check for seedlings annually.



Yellow Bristle Grass

Botanical Name

Setaria pumila

Family

Poaceae (grass)

Also known as

Yellow foxtail

Where is it originally from?

China

What does it look like?

Yellow bristle grass is an upright annual-seeding plant growing 25-45cm high. In open pasture its first leaves are typically parallel to the ground. The leaves are yellow-green to green in colour and usually red or purple at the base. They are flat, hairless, soft and twisted. The leaf sheath is flattened.



Are there any similar species?

Knot-root bristle grass, Rough bristle grass, Summer grass are all similar.

Why is it a pest?

Yellow bristle grass (YBG) is an aggressive annual-seeding plant which spreads rapidly through pasture, reducing pasture quality. Cows don't willingly eat it, leading to low pasture utilisation. Grazing avoidance leads to rapid re-infestation and an opening for other weeds.

How does it spread?

YBG reproduces only by seed. Seeds pass through the rumen and are spread around the farm in dung. Seeds are also spread by water, soil movement, animals and as contaminants of hay and maize. The barbed seeds stick to and are often carried in fur, feathers, or clothing.

What damage does it do?

Spreads rapidly through pasture, reducing pasture quality. Cows don't willingly eat it, leading to low pasture utilisation. Grazing avoidance leads to rapid re-infestation and an opening for other weeds.

Which habitats is it likely to invade?

Roadsides and waste areas, low quality pasture particularly in drought years.

What can I do to get rid of it?

If you think you have found Yellow Bristle Grass contact The West Coast Regional Council biosecurity staff.

What can I do to stop it coming back?

1. **Better pasture competition:** reduce or eliminate damage to pastures at the time when yellow bristle grass germinates, between October and December.
2. **Elimination of seed production:** remove seeds through early topping (before viable seed are set), heavy grazing or chemical spray topping.
3. **Complete renovation:** for poor pastures complete renovation is the best option, either by going through a summer crop such as chicory (where grass weeds are easily controlled) or by spraying out with glyphosate in early autumn. In either case a strong sward needs to be established before winter. If winter weeds are present they should be sprayed with 2,4-DB or MCPB herbicide, which won't damage clovers, so as not to leave gaps in the new pasture in early summer. Pasture grasses and clovers appropriate to local conditions should be used in the grass mixture.



Yellow Flag Iris

Botanical Name

Iris pseudacorus

Family

Iridaceae family

Where is it originally from?

Europe, Asia, North Africa

What does it look like?

Robust aquatic perennial to 1-2 m that grows in leafy clumps and forms dense rhizomes (up to 3 cm diameter). All parts are odourless when crushed. Stems

are round, and several long sword-like leaves (1 m x 2-3 cm) emerge in fans from a reddish base. From October to December pale-yellow to golden-orange flowers (up to 12 cm diameter) are produced, followed by seed capsules (5 x 2 cm) containing many brown, flattened, 3-sided to disc-like seeds.



Are there any similar species?

Many Gladiolus and related species are similar, and there are four other exotic Iris species that appear in the wild. *Iris pseudacorus* is the only aquatic species that grows in clumps and has tall stems and yellow flowers.

Why is it a pest?

Rhizomes form dense floating mats, and it overtops native species that grow on margins of waterbodies. Tolerant of saline, frost, flooding and drought, high-low fertility, many soil types, and damage. Poisonous, so usually not grazed by stock.

How does it spread?

Seeds and rhizome fragments are spread by water and contaminated machinery. It is a 'garden escape' plant that has spread from gardens and deliberate plantings into the environment.

What damage does it do?

Rhizome mats displace native plants, especially vulnerable species that live on the margins of waterbodies. It can cause flooding and changes in the water levels in swamps. Poisonous seeds may have an impact on birdlife.

Which habitats is it likely to invade?

Swampy ground, fresh or brackish water margins, lakes, salt marsh, and wet sandy areas.

What can I do to get rid of it?

1. Weed wipe (spring-autumn): glyphosate (333ml/L + penetrant).
2. Stem injection (all year round): 5 ml undiluted glyphosate into each stem at base.
3. Spray (spring-autumn): glyphosate (100ml/10L + penetrant) or metsulfuron-methyl 600g/kg (0.5g/10L).

What can I do to stop it coming back?

Plant tall shading species adjacent to sites, and exclude livestock. Prevent seeding, and ensure regular follow-up of sites that have been controlled, as rhizomes resprout and seed bank can reinfest bared sites.

