

KNOW YOUR WEED

Each weed needs to be researched to identify its vulnerabilities. Existing weed profiles don't always provide enough information for landcarers (and many are geared towards farmers so control methods may not be suitable). This weed profile is adapted from Robin Buchanan's "Bush Regeneration" template, adding sections such as weed vulnerabilities and ecological function. This helps us appreciate weeds are there for a reason and to make sure its ecological role is filled as part of restoration. Profiles can be summarised in the weed inventory 'comments' column.

WEED PROFILE SHEET:

SCIENTIFIC NAME (FAMILY):

COMMON NAME:

ORIGIN:		
HABITAT (soil & moisture requirements, ecological community):		
HABIT:	HEIGHT:	WIDTH:
LEAVES:		
Length:	Width:	Margin:
Shape:	Colour upper:	Colour lower:
Type:	Arrangement:	Venation:
Texture:	Other (ligules, etc):	
STEM:		
FLOWERS:		
Season:	Size:	Pollination:
Inflorescence:	No. petals:	Colour:
Other (e.g., bracts):		
Monoecious?	Dioecious?	
FRUIT:		
Type:	Colour:	
Size:	Season:	
SEED:		
Size:	Colour:	Number:
Longevity & Viability:		
Germination requirements (season, moisture, dormancy):		
MAIN GROWTH PERIOD:		
ROOT SYSTEM / UNDERGROUND STRUCTURE (e.g., fibrous / tap / laterals / suckering/ tuber/ rhizome/ root at nodes?):		
Regrowth ability?		
DISPERSAL MECHANISMS:		
PLANT CHARACTERISTICS:		
Longevity:	C3, C4 or CAM:	
Life form (aerial, surface, half-hidden, earth, annual, epiphyte):		
Succession (e.g., pioneer, climax):		
Why is the weed here? Its ecological role:		
Microbial (eg, allelopathy, nutrient cycles):		
Competitive advantages: (e.g., choking, smothering, phytotoxins, brittle stems):		
Vulnerabilities: (e.g., fire, seed longevity, temperature and seed viability, shade):		
REMOVAL TECHNIQUES:		
Manual:		
Poison:		
Follow-up:		
Best season:		
Response to fire:		
SIMILAR SPECIES:		
REFERENCES		

Resources to research weed life cycles, best control methods

1. Online

Weed Identification app: [WeedScan](#) – CSIRO tool

[ACT Weeds Manual - SACTCG ACT Weeds Manual ID, and management](#) A locally produced weed manual. Doesn't contain all the information we are after. Information such as 'seed viable for many years' for *Verbascum* doesn't convey the danger of piling seed heads on site (NB: seed from archaeological deposits was viable after 650 years and other reports of its long-term viability). However, the manual is only in its first edition and will be updated / improved.

[Weed profiles - Weeds Australia](#) This is a University of Canberra site that has the profiles of almost 400 weed species. has *Acer negundo*, Chilean Needle Grass, Sheep sorrel, tree of heaven, onion weed, wild mustard (*Hirschfeldia incana*), various thistles, 2 *Celtis* species, skeleton weed, cotoneaster, hawthorn, Patterson's curse, ALG, CNG, ST, 2 types of spurge, sticky weed (*Gallium*), Ivy, SJW, Golden rain tree (*Koelreutaria*), privet (broad & small), honeysuckle, poplar (white & Lombardy), pyracantha, briar rose, willow, *Salvia reflexa*, *Silene* (bladder campion), great mullein

[Weeds information | Weeds | Biosecurity | Agriculture Victoria](#) – an invasive plant site, focused on agricultural weeds (only 42 weeds). Great life cycle information. Management methods may be more suitable for farmers - less suitable for landcarers.

[Weed Profiles | CALS](#) Cornell College of Agriculture and Life Science > Weed Science > Weed Profiles. USA site. Includes only a few weeds we are interested in but extremely well researched and containing most of the information we are after. Weeds worth checking include wild oats, sorrel, wild mustard, prickly lettuce, cleavers (*Galium* sp) plantain, morning glory (for coastal areas)

[PlantNET Home Page - National Herbarium of New South Wales](#) Good for plant identification, plant description, distribution.

[NSW WeedWise](#) (NSW DPI) – weed profiles & control methods.

[Friends of Grasslands Weeding Brochure](#) FOG (ACT) has many useful resources and papers.

[CABI Compendium Invasive Species | CABI Digital Library](#)

[Weed control handbook for declared plants in South Australia](#)

[EPS-0420-83 Priority Weeds booklet FA02 digital.pdf](#) (Blue Mts city council booklet - includes techniques section - relevant weeds include box elder, blackberry, tree of heaven, privet, black locust - *Gleditsia*, *Robinia pseudoacacia*, SJW, pyracantha, Patterson's curse, ALG, ST, [broom & gorse not a prob at Umbagog])

[New South Wales Weed Control Handbook, Seventh Edition](#) (NSW DPI – focuses on herbicide use but non-herbicide methods described for each plant. Herbicide application techniques pp 21-24) and specifications for their declared noxious weeds (which currently does not include Box elder!) pp. 29-121. Integrated weed management (including herbicide & non-herbicide) techniques described pp 1-4.

[Invasive Plants - Common Name - G | VRO | Agriculture Victoria](#) – an invasive plant site, now archived, with risk assessment methodology

2. Books to research weeds

Barrett et al. 2018. "Field Guide to Plants of the Molonglo Valley" (ACT Government PCS) – descriptions and photos, including a list of other species of the genus in the ACT (ie lookalikes). Both weeds and natives.

Bradley, Joan. 2017. "Bringing back the Bush" (New Holland Publishers) -techniques and case studies of some weeds.

Buchanan, R. 1991. "Bush Regeneration" (NSW TAFE) -techniques and case studies of some weeds.

Eddy D. et al 2005. "Grassland Flora a field guide for the Southern Tablelands (NSW & ACT)" (NCP Canberra) – identification, habitat and lookalikes.

Richardson, F. J., Richardson, R. G. & Shepherd R. C.H. 2025. *“Weeds of the South-East: an Identification Guide for Australia”* (4th edition). CSIRO Publishing.

Rowell, RJ 1994. *“Ornamental flowering trees in Australia”* University of NSW Press. [also *“Plants”* and *“Flowering Shrubs”* volumes, 1992; 1994] –scientifically accurate descriptions of garden plants – including many now weeds.

Weed Mapping, Invasiveness ranking tools

ACT Invasive Plants Operations Plan 2020-25 (Parks & Conservation Service and City Services)

(References prioritisation tools and links to resources, including a mobile weed mapping app used by ACT government staff and contractors and volunteers).

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Example of St John’s Wort Weed Profile

WEED PROFILE SHEET

SCIENTIFIC NAME (FAMILY): *Hypericum perforatum* subsp. *veronense* **COMMON NAME:** St John's Wort

ORIGIN: Europe, Western Asia and North Africa		
HABITAT (soil & moisture requirements, ecological community): Grassland, grassy woodland, woodland, riparian. The heaviest NSW / ACT infestations are in the central and southern tablelands and slopes. It grows on a wide range of soils but seems to prefer soil with slightly acid to neutral pH, well-drained, coarse-textured soils. Becomes established on eroded, infertile areas of gravelly silt loam and on coarse sandy loam soils, as well as on fertile valley-bottom pasture land. Soil fertility and depth may affect the growth habit and longevity. St John's Wort is found mainly in water catchment reserves and hilly, forested areas, as well as on roadsides, intermittently grazed areas, railway land, riverbanks and in pastures. When on farmland, it is mostly associated with non-arable land - uncommon on pastures with vigorous growth of 'improved' pasture species (i.e. exotic, not native grasses). The most vigorous infestations occur at altitudes of approximately 600 m with an annual rainfall exceeding 760 mm and wet La Nina years. However, the plant is widespread over a range of climates, although low temperatures inhibit seed germination and seedling survival. High summer temperature also impacts negatively on the weed's performance. The plant thrives in areas that receive either winter or summer rainfall. (Campbell <i>et al.</i> 1995).		
HABIT: upright herb	HEIGHT: up to 1.2m	WIDTH: rhizomes extend ~1m
LEAVES: Broad leaf (var. <i>perforatum</i>) and narrow leaf (var. <i>angustifolium</i>) forms with twice the hypericin concentration in the latter, but taxonomically considered but the same (variable) plant. To tell them apart measure leaves at the 6th node (bump) on the flowering stem when the plant is growing well in spring. The narrow-leaf strain has leaves 7 – 9 mm wide. The broad-leaf strain has leaves 10 – 12 mm wide. Narrow leaf more common.		
Length: 5-25mm	Width: 1.5-5mm	Margin: entire
Shape: lanceolate to linear	Colour upper: green (bluish tinge if dry)	Colour lower:
Type: sessile (no petiole)	Arrangement: opposite pairs	Venation: yellowish parallel
Texture: glabrous (hairless)	Other (ligules, etc): oil glands visible <i>when</i> held to light	
STEM: reddish colour with two opposite ridges running along the length of the stem, base can be woody		
FLOWERS: Doesn't flower in its first year		
Season: November to March (peaks Dec-Jan)	Size: 15–20 mm in diameter	Pollination: insect
No. petals: 5	Colour: yellow with black oil glands at edges	
Other (e.g., bracts): edge of petals ragged, 2-3 times as long as sepals		
Monoecious? Yes	Dioecious? No	
Inflorescence: Loose clusters of five-petalled, stalked flowers at the tops of a flower stem. Flower stems are branched and each branch also has a terminal <i>cluster</i> of flowers.		
FRUIT:		
Type: sticky three-celled ovoid capsule that splits open from the top when mature		
Colour: green maturing to brown		
Size: 5-10mm long	Season: December-April	
SEED:		
Size: 1 mm long and 0.5 mm wide	Colour: golden-brown	
Number: 400-500 seeds per capsule; up to 33,000 per plant		
Longevity & Viability: 12 years longevity usually cited by Australian sources, though see US Forest Service quote below. Weeds Australia says: "Seeds have been known to germinate after lying dormant in the soil for 10 years (Campbell <i>et al.</i> 1995). However, the vast majority of seeds germinate within the first few years of being produced (Parsons & Cuthbertson 2001)."		

US Forest Service [Species: *Hypericum perforatum*](#) : "Reports of common St. Johnswort seed viability following dry storage in the laboratory indicate 94% germination after 5 years, and 50% germination after 16 years of storage. Several researchers indicate that common St. Johnswort seed remains viable under field conditions for several years. Observations by Clark indicated that common St. Johnswort seeds remain viable in the soil for at least 6 years at field sites in Australia. Bellue (1945) suggests that common St. Johnswort seed retains viability in the soil for 10 years in California. Harris and Gill estimate common St. Johnswort seed longevity at 30 years or more in pine (*Pinus spp.*) plantations in Australia."

Germination requirements (season, moisture, dormancy): Seeds are released autumn to winter following flowering. Germination needs mild temperatures, light and rainfall. Low temperatures inhibit germination. Germinates from autumn to spring, but new plants do not flower in the first year.

MAIN GROWTH PERIOD:

Spring. Flowering stems grow from the crown each spring and die in the following autumn. Most new foliage (non-flowering stems growing from the crown) grows during autumn and winter and dies in late spring.

ROOT SYSTEM / UNDERGROUND STRUCTURE

(e.g., fibrous / tap / laterals / suckering/ tuber/ rhizome/ root at nodes?):

Tap root up to 1m deep, lateral rhizomes. Individual plants increase in size by growing outwards from the roots in concentric circles. Suckering especially pronounced in shallow soils.

According to the Montana Field Guide, rhizomes grow 2-3 inches (up to ~8cm) below the soil surface, horizontally, and can extend 3 feet (~1m).

Established root crowns can may produce up to 30 flowering stems each year. Root crown density has been found to range from 12 to 37 per square meter.

Regrowth ability? Yes rhizomes have buds that can sprout and produce new crowns.

DISPERSAL MECHANISMS:

St John's Wort reproduces from crowns, lateral roots and seed. Sticky capsules can adhere to the coats of animals and seed remains viable after being consumed by livestock. Moved by machinery. Wind may transport the seed over short distances. Water currents also spread the seed, especially where plants are in areas prone to surface run-off or in riparian habitats. Cultivation may spread the plant by scattering the root fragments. Plants also spread by the production of lateral roots which can form new crowns (Campbell *et al.* 1995).

PLANT CHARACTERISTICS:

Longevity: no info **C3, C4 or CAM:** C3 (according to Illinois Plant Information Network)

Life form (aerial, surface, half-hidden, earth, annual, epiphyte): Earth

Succession (e.g., pioneer, climax): both early successional species of disturbed sites and secondary coloniser.

Why is the weed here? Its ecological role: overgrazed pastures are particularly susceptible (pasture management is a remedy for farmers). SJW is poisonous to grazers so ecologically it deters grazers while land is recovering. The mat of lateral roots would also hold topsoil together and reduce erosion. It is often found on slopes and damp areas that might be susceptible to erosion.

Microbial: I can find no research about whether SJW secretes toxins to attack nearby plants / their germination, or whether it alters micro-flora / fauna / mycelia or soil nutrients. However, "if left to establish, can eliminate almost all other plants" (Weeds Australia) is suggestive, particularly given SJW uses chemicals to control grazers. Canadian researchers found it was often associated with an arbuscular mycorrhizal (AM) fungus that seems to make it better able to tolerate harsh environmental conditions.

Competitive advantages: (e.g., choking, smothering, phytotoxins, brittle stems):

Rhizomes start new plants if broken.

If left to establish, it can eliminate almost all other plants. [Impact on native fauna / insects?]

Produces hypericin to deter grazers. Hypericin levels vary according to season (peaks in full blooming flower stems; moderate levels in prostrate runners over winter). When animals ingest hypericin, it passes from the stomach to the bloodstream. When hypericin enters the blood vessels in the skin of an animal it is activated by bright sunlight. Sunlight alters the chemical structure of hypericin, making the compound potentially poisonous. Hypericin causes

skin irritation and also has negative effects on animal behaviour and organ function. Although St John's Wort is usually avoided by grazing animals, they will consume it when other feed is scarce. Ingestion can cause weight loss, failure to gain weight, reduced wool and milk production, and reduced reproductive performance. Horses especially badly affected. Overstocking encourages the weed as livestock prefer other species, reducing competition. [Medicinal uses, eg, for depression but interferes with other medicines.]

Vulnerabilities: (e.g., fire, seed longevity, temperature and seed viability, shade):

Seeds buried at 5mm or deeper will not germinate.

Low temperatures inhibit seed germination and seedling survival.

Sensitive to competition when SJW plants are young. Seedlings compete poorly with adjacent plants for light, nutrients, space, and moisture. Seedling mortality can be high.

High summer temperatures inhibit growth.

Requires abundant light for best development. Evidence for this is provided by its occurrence in open grasslands and in open or disturbed forest sites, but not within undisturbed, dense forests, dense bush, or under the shade of trees in open forests. (However in Australia they do well under Eucalypts). Plants growing in shaded sites grow more slowly and produce less fruit but live longer.

Six biological control agents in Australia. The most effective are Chrysolina leaf beetles (*Chrysolina quadrigemina* & *C. hyperici*) and the St John's Wort Mite (*Aculus hyperici*). The beetles have low mobility and need help to relocate. They only mate in full sunlight, so are less effective in wooded areas. Beetle larvae attack the winter growth and the adult beetles attack the spring growth. Inactive in summer. The mite only acts on the narrow leaf form, is active all year and can weaken and kill plants over a 3-year period (NSW DPI). See also Briese 1997; Keith Turnbull Research Institute (1999) and Keith Turnbull Research Institute (2000) for specific information on the Chrysolina Leaf Beetle and the St John's Wort Mite. For information on the potential use of fungal pathogens to control St John's Wort in Australia see McLaren *et al.* (1997).

REMOVAL TECHNIQUES: Methods vary according to land use. Governments advise farmers against manual removal and suggest managing SJW by a combination of reduced stocking, biological control, herbicide, sowing exotic pasture species and fertilizing it to encourage vigorous growth. Establishing vigorous exotic pasture is obviously not appropriate management for native grasslands. Note also some improved pasture grasses produce toxins that suppress native grassland species.

Manual: Umbagog Landcare Group method: First cut and bag any seed heads. Manual removal is best done after rain. Use Bradley Method to systematically work out from a quality core patch and each year begin again at the same spot. Use hand tools such as a narrow trowel or knife to remove the tap root as deep as possible. Trace back lateral roots as far as possible (fingers may be effective in preventing roots from breaking). Rhizomes often extend underneath native plants and tangle into them, eg, through the roots of native grasses like Themeda. It is better to break the SJW root at this point than to risk damage to the Themeda plant. Leave any regrowth for follow-up.

Due to the number of laterals, weeding results in soil disturbance and it is a good idea to harvest a pinch of adjacent native grass / forb seed, scratch it into the disturbed area, tamp down the soil and cover with Themeda bale straw /on-site thatch or whatever mulch is at hand, which could include (de-seeded) weeds. In conjunction with the 'Bradley Method', reduce the seedbank and vigour of the SJW over the whole the target area by pulling / de-seeding flowering plants in summer. Pulling better if wet but laterals will break requiring follow up.

Poison:

Joerg's method (a cut-dab technique): Time-specific. Wait till the basal leaves have died off in late spring and the flowers are just opening. This method means you can be more economical with your poison and not waste it covering every leaf, lower risk of poisoning non-target plants. Cut the flower stem and immediately apply full strength glyphosate 360 to the cut end.

NSW DPI 'Weedwise' advice [spraying]: Needs adequate foliage to absorb poison, so don't poison plants defoliated by chrysolina beetles. Spray herbicide when actively growing (most new foliage appears autumn-winter and seedlings autumn-spring; maximum foliage in spring). Cover all the foliage with herbicide. Two consecutive years of spraying is often required to kill plants. The deep, extensive root system can survive the first treatment, and the plant can regrow. Reduce damage to pastures through herbicide selection and timing. Spot-spray isolated infestations when St John's wort is in flower (November to January). It's too late once the flowers have turned brown.

Glyphosate 360 g/L: Rate: 3.0 L/ha: Apply November to May, flowering to post-flowering. This is the only poison landcarers are allowed to use. It is non-selective so will kill all native plants as well, so only apply by dabbing. Some landcarers prefer to dab at the rosette stage (spring).

Fluroxypyr 333 g/L (Starane™ Advanced) Rate: 3 mL in 1 L of water + 1 mL / L surfactant: Foliar application from flowering to early seed set. Note fluroxypyr is a selective broadleaf herbicide (will not kill grasses but will kill other broadleaf forbs so not advisable in quality native grasslands). “A survey of landcarers’ experience with St John’s Wort” by Lauren McQueen & Sarah Hnatiuk (2024) found: “Some volunteers report that at least daisies and peas are unaffected” (by spraying with Starane).

Other poisons: Metasulfuron, 2,4-D, Picloram, Aminopyralid, Triclopyr: some selective, some leave residues in soil.

Follow-up: If using the Bradley Method, systematically hand weed the same ground once a year till none regrows and no seedlings germinate. Complete eradication may take several years but with greatly reduced effort after the first 2 years. ACT Weeds manual suggests following up several times during the season each year but personal experience suggests once a year is sufficient providing weeding systematically covers the same ground each year and is thorough. Too frequent re-working of the site could trample the plants you wish to encourage.

Best season: Flower & seedhead removal Nov – Apr; Hand weeding in any season (especially after rain). Poison during active growth a few weeks after rain when flower is just opening (varies Nov-Jan).

Response to fire: Responds positively to fire. Heat seems to stimulate germination and researchers have observed flushes of SJW seedlings following fire. Plants will also quickly resprout from underground roots. Dry stems can be a fire hazard in Summer (Parsons & Cuthbertson 2001).

SIMILAR SPECIES: 2 native species of *Hypericum* (*H. gramineum* & *H. japonicum*) and one other exotic (*H. androsaemum*) in the ACT.

H. gramineum – to 40cm; single flower, sepals almost as long as petals; bluish leaves tend to clasp stem vertically with margins that roll under found in low-lying grasslands, compact clay soils, drainage / seepage sites; *H.*

japonicum similar but stems usually spread along the ground. *H. androsaemum* (Tutsan) is a 1.5m shrub, curry-scented, has much larger, oval leaves 20–120 mm long, 10–80 mm wide, fruit are berry-like, red or black.

[A more closely related lookalike, St Peter's Wort (*H. tetrapterum*), also a weed, is not found in ACT; its stem has four ridges; St John's Wort has only two ridges].

REFERENCES

[St John's wort](#) (NSW DPI Primefacts, Oct 2007)

[NSW WeedWise](#)

US Forest Service: [Species: *Hypericum perforatum*](#)

Montana Field Guide: [Common St. John's-wort - Montana Field Guide](#)

[Weed profiles - Weeds Australia](#) (University of Canberra)

Barrett et al. 2018. “Field Guide to Plants of the Molonglo Valley” (ACT Government PCS)

[St John's wort beetles » Manaaki Whenua](#)



Chrysolina leaf beetle foam on St John's wort plant (left); beetles eating SJW leaves (middle) (Photos: Mark Imhof ([St John's wort \(*Hypericum perforatum*\) \(Nox\) | VRO | Agriculture Victoria](#)); C. quadrigemina larva (right): Eric Coombs Oregon Department of Agriculture; photo cropped); C. hyperici egg laid on underside of leaf (top) (Manaaki Whenua Landcare Research).