

St John's Wort

Department of Primary Industries

Updated: September 2007

LC0177

ISSN 1329-833X

Common and botanical names

St John's wort

Hypericum perforatum L. Family Clusiaceae

Origin and distribution

Native to Europe, Asia and North Africa, St. John's Wort first became a problem in Victoria near Bright, late in the 19th century. It was widespread in North East Victoria by 1905.

St. John's Wort is found through much of Victoria with the most severe infestations in the North East. It invades grasslands, woodlands, open forest, pastures, forestry plantations, roadsides, railway lines and river banks.

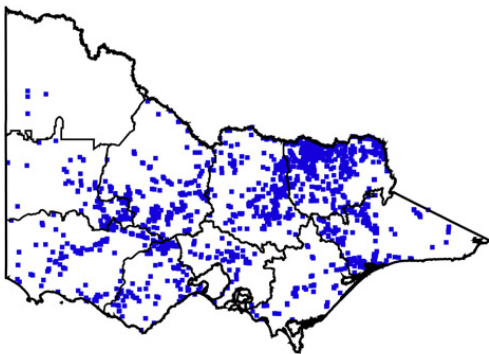


Figure 1. distribution of St. John's Wort in Victoria.

Description

Perennial herb, usually about 80 cm high.

Stems – non-flowering stems to about 30 cm long grow from the crown in autumn and winter and form tangled thickets (Figure 5). Erect, woody, flowering stems to 1.2 m produced from crown in spring, often reddish, with long ridges bearing dark glands. Young stems weakly two-ridged.

Leaves – in opposite pairs, 5-30 mm long, 1.5-5 mm wide, oval to linear, hairless, upper margin usually curved over, underside paler; distantly black-dotted or black dots confined to near apex; bearing numerous translucent oil glands visible when held to the light (Figure 4).

Flowers – 2 cm diameter, in numerous terminal clusters (Figure 3). Five sepals, five petals; sepals 4-7 mm long, rarely with 1 or 2 black dots on margin; petals 2-3 times as long as sepals, golden yellow with black dots on the margins.



Figure 2. St John's wort.

Fruit – a sticky, narrowly ovoid capsule, to 8 mm long.

Seeds – light to dark-brown or black, 1 mm long, cylindrical and pitted (covered with many indentations), germinate during autumn, winter and spring. A plant may produce up to 33,000 seeds per year.

Roots – stout, to 1 m deep in the soil, with woody, lateral rhizomes which grow horizontally, producing buds that form new aerial growth.



Figure 3. Flowers

The problem

St John's wort is extremely invasive and competes strongly with native vegetation and pasture. Well-established infestations can largely eliminate all other plants and restrict recruitment to the overstorey. Seed can remain dormant in soil for at least 20 years.

**Weeds cost Victorian Agriculture \$900 million per year.
How much do they cost you?**

When eaten by livestock, St John's wort causes photosensitisation of exposed skin (inflammation e.g., of face, ears, lips), affects the nervous system of animals causing depression and hyperthermia (panting, salivation, respiratory distress) and alters heart, blood vessel and intestinal function. Chronic poisoning results in weight loss, reduced reproductive performance and death. Light-skinned and soft-skinned animals and those with white markings are the most affected. Those with thick, tough and pigmented skin are less affected. Early signs of clinical poisoning include agitation, pawing of the ground, rubbing of the head and face against fixed objects and mild diarrhoea.

Hypericin in the oil glands of St John's wort leaves and flowers is the cause of the toxicity, but the effects depend on activation by bright sunlight of the poison circulating in the bloodstream. Tolerance of any animal to the poison appears to be directly related to the amount of skin surface protection it has.

The minimum toxic dose of foliage for sheep is about 4% of live weight. Horses are more sensitive to hypericin than cattle and sheep, with goats the least sensitive. Recent studies indicate that Hereford cross cattle are two to three times more tolerant than Merino sheep. The amount of St John's wort consumed to produce a toxic reaction is less when the plant is in flower or when animals graze the more toxic, narrow-leaved biotypes.

Affected animals generally recover after 3 to 6 weeks once removed from access to the plant, but sheep with early signs of poisoning typically recover within 12 hours if they are moved indoors. Poisoning can reduce milk yield, and cause abortions in animals. The plant is more toxic when in flower and may contain more than 50 times more hypericin in early summer than in late winter. Narrow-leaved forms of the plant can be twice as toxic as broad-leaved biotypes. Plants become markedly more poisonous when the flowering shoots have grown 5-10 cm high. Hay containing St John's wort also causes poisoning.

The plant has a number of medicinal and pharmaceutical uses.

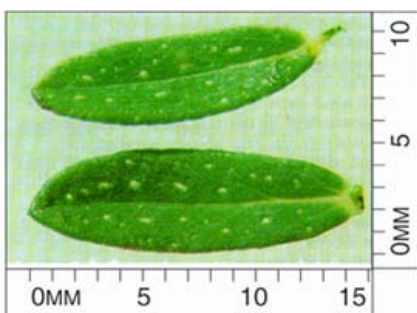


Figure 4.
Leaves
showing
translucent
oil glands.

Similar species

There are two native *Hypericum* species. Care should be taken to not confuse them with St John's wort. The two natives have four-ridged stems, leaves that are generally less than 3.5 cm long and petals and anthers that lack black gland-dots.



Figure 5. Crown and upright flowering stems in autumn

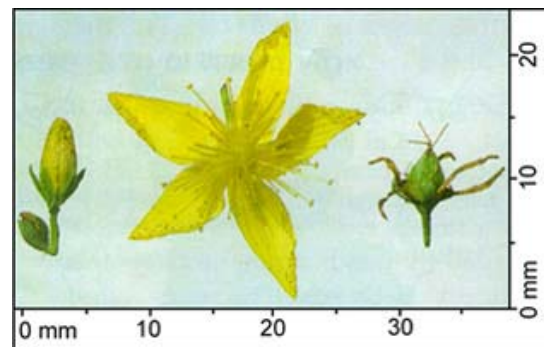


Figure 6. Flower bud, flower and young fruit

There are also seven other introduced *Hypericum* species naturalised in Victoria including the noxious weeds tutsan (*H. androsaemum*), St Peter's wort (*H. tetrapterum*) and tangled hypericum (*H. triquetrifolium*). St John's wort is the only one with two-ridged stems, leaves less than 3.5 cm long that are curved under at the edges, conspicuous translucent oil glands, and black gland dots present on the petals and anthers but usually absent from the sepals.

Life cycle and reproduction

St John's wort reproduces from crowns and roots and by seed. It generally does not flower in the first year of growth.

All land managers have a responsibility to manage weeds on their property.

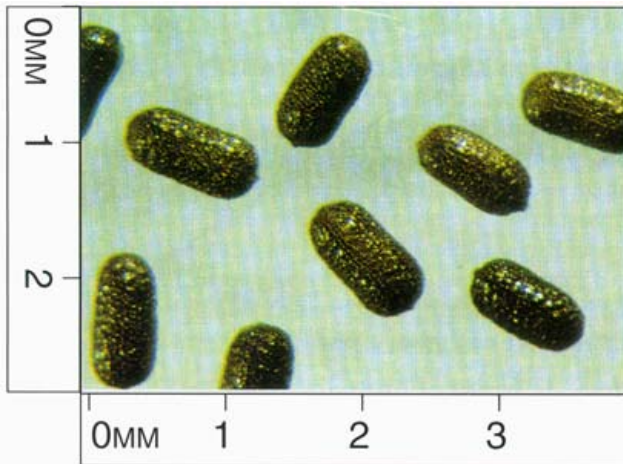
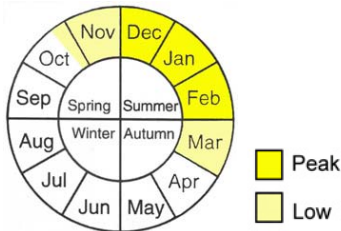


Figure 7. Seeds

Flowering period



Dispersal

Seeds adhere to stock and other animals, and are carried in the digestive tract of animals. Seedlings have been observed in cattle dung. Seed spreads only short distances by wind, but can be carried long distances by water, machinery and animals. Rhizomes grow horizontally producing buds which form new crowns. Cultivation may spread pieces of rhizome which produce new plants.

Management program

Some control methods described in this note are only effective if used in combination with other control options as part of a long-term management program.

If used in isolation, these methods do not effectively destroy the plant, allowing it to re-shoot or continue to grow. Authorised officers from DPI or DSE may direct landowners to undertake specific control activities to ensure methods are used that are capable of destroying plants and preventing their spread.

Where directed to do so, landowners must use the method or methods as directed by the authorised officer. In most cases the landowner will be able to choose from a variety of options appropriate for use in their particular situation.

General approach

Integrated management strategies are required to effectively control St John's wort. These strategies must involve setting priorities for controlling different levels of

infestation and choosing appropriate treatment methods for each infestation. Clean areas should be kept free of St John's wort and managed to prevent infestation. Lightly infested areas should be cleaned up as soon as possible to prevent spread. Extensive infestations are best quarantined and tackled progressively over several years.

Prevention

Be aware of potential sources of infestation. Stock grazed in infested areas should be quarantined before movement to clean areas. Removal of plants from laneways, stock routes and roadsides should be a priority. Machinery and vehicles used in infestations should be cleaned. Ensure fodder is not contaminated and use certified seeds.

Isolated plants are readily identified and conspicuous when in flower. Hand pull seedlings and use hand tools to dig out larger plants before seed is shed. Ensure that most of the rootstock is removed. Regularly revisit the site to check for new growth.

Elimination of rabbits will remove the selective grazing pressure that favours the weed and assists with limiting spread as seeds stick to rabbits fur and feet.

Specific actions

Cultivation

Cultivation can be effective on arable land when followed by the sowing of competitive pasture or crops. Cultivate in summer to expose and to dry out as many of the roots as possible.

Pasture management

Superphosphate and subterranean clover have been used to control St John's wort since the early 1950s. The clover provides dense shade which kills the non-flowering stems of the weed. Phalaris is a suitable grass for the pasture mix. Soil testing should be carried out to help determine the most appropriate fertiliser strategy to apply. Advice on superphosphate application and choice of effective pasture species should be sought from a pasture specialist.

Grazing

Stock generally avoid St. John's wort and light stocking of infested areas can favour the weed by reducing competing plants. However cattle, sheep and goats can be used very effectively in an integrated control program and the feed value of St John's wort leaves is high. In the past, coloured breeds of goats and cattle and dark-skinned sheep have usually been recommended, as they are less affected by the plant's toxicity. But recent research has demonstrated that ordinary grazing stock can be used if certain precautions are taken.

Light infestations can be controlled by heavy grazing and heavy infestations on non-arable land can be controlled by a long term grazing management program, or on arable land by ploughing, sowing of improved pasture and heavy grazing.

All livestock are more susceptible to hypericin poisoning

**Weeds don't respect boundaries.
If a weed is a problem on your property, it's a problem for your neighbours.**

under sunny conditions. Sheep that have been recently shorn are more susceptible because their skin has greater exposure to sunlight. Sheep with fine and superfine wool appear to be better protected and are therefore more tolerant of the plant.

Heavy grazing of broad-leaved biotypes of St John's wort with Merino wethers with at least four months' wool growth from late autumn to early spring will suppress the weed and is safe. Safe grazing of narrow-leaved biotypes with sheep is only possible from early July to mid September. Fencing to create smaller paddocks should be used to increase the grazing intensity. The presence of adequate shade will improve the performance of the sheep. Cattle can be used before and after sheep because they are more tolerant of hypericin.

Alternatively, rotational grazing with the stock removed after a one or two week exposure to the weed and returned after five weeks can allow infested pastures to be grazed with limited ill effect on stock. Heavy grazing on the prostrate stems during winter and early spring can significantly reduce the vigour of the weed. Because new growth has lower hypericin production, the safe grazing period can be extended by heavy grazing, and as the density of an infestation is reduced, less of the plant will be ingested by grazing livestock, allowing for further extension of the safe grazing period.

Animals showing symptoms of poisoning should be moved into full shade, preferably inside a shed, for at least four to seven days. Graziers intending to use livestock to control the weed should familiarise themselves in detail with the recent research.

Afforestation

St John's wort cannot survive in dense shade. Planting of pines will suppress the weed, but St John's wort is often the last plant to disappear as the canopy closes, and reappears when the plantation is harvested.

Chemical treatment

Chemical (herbicide) treatment can be a key part of the St. John's wort integrated management plan but it is not desirable to have it as the only control action.

The Australian Pesticides & Veterinary Medicine Authority (APVMA) is responsible for the assessment and registration of agricultural and veterinary chemicals in Australia. As chemical products are registered on a daily basis and renewal of these registrations are undertaken each financial year, there is much change in the registration status of products each year. The APVMA information is available at: <http://www.apvma.gov.au/>

The Chemical Standards Branch (CSB) of the Department of Primary Industries provides information on agricultural chemicals registered in Victoria and their uses. Enquiries will be referred through the Customer Service Centre on 136 186. Information can also be obtained by visiting the CSB website: www.dpi.vic.gov.au/chemicalstandards

Under Victorian legislation there are controls on the use of agricultural chemicals. It is the responsibility of

the user to be familiar with these controls. These responsibilities are outlined in Agriculture Note AG0520: "Responsible use and handling of farm chemicals".

Farm chemicals are registered for specific uses. Each chemical has a 'product label', which documents the approved use and the approved rate of use within each State of Australia. This label is important in determining the appropriateness of chemical use.

Choose only products registered for use on St John's wort in your particular situation. Read the product label carefully and follow all label instructions.

Your chemical retailers can provide information on registered chemical products that are available in their store. They can also supply a 'material safety data sheet' which outlines the health and safety issues associated with use of a product.

Legal use of some restricted chemicals requires the user to possess an Agricultural Chemical User Permit (ACUP). Other chemicals have restrictions on their use in Agricultural Chemical Control Areas (ACCAs).

Information on ACUPs, ACCAs and other chemical information can be found at the website: www.dpi.vic.gov.au/chemicalstandards

Herbicide applications tend to be least effective in dry, rocky, hill country with shallow soils.

Herbicides should be applied to actively growing plants early in the flowering period (late October to December), and when the soil is moist. In pasture situations grazing can be used before herbicide application to reduce grass cover and expose more of the weed.

Seedlings are most readily killed by herbicides than established plants which may require repeat applications.

When spot spraying, aim to completely wet the plant to cause run-off. Add a dye or spray marker to the spray mixture to identify treated areas.

Ongoing management

- Cooperate with neighbours
- Undertake regular inspections and follow-up work
- Be persistent in implementing a long term management plan
- Seek professional advice

Biological Control

Two species of beetle, first released in the 1930s, have established in Victoria: *Chrysolina hyperici* and *C. quadrigemina*. The adult beetles are bronzy black, dark-blue, or purple, about 6 mm long and oval in shape. The larvae are orange with dark heads and the eggs are orange. Both larvae and adults defoliate the weed. Larvae attack the winter growth and adults attack the spring growth. Within a few years at favourable sites the beetles reach densities which are high enough to cause complete

Early treatment of new infestations will give you the best value for your weed control dollar.

defoliation. The beetles are effective in open, unshaded country in conjunction with improved pasture.

The St John's wort gall midge *Zeuxidiplosis giardi*, first released in Australia in 1953, has red larvae which develop in circular galls on the leaves. It is generally ineffective but is most abundant in damp shaded situations

An aphid *Aphis chlores*, released in 1986-87, spread rapidly and is well established. It contributes to biological control of the weed however it only weakens plants for a short time. The St John's wort aphid has no preference between sunny and shaded areas and is most commonly found on flowering stems in summer.

The St John's wort mite *Aculus hyperici*, first released in 1991, has no preference between sunny or shaded areas. The mites stunt the growth of both rosettes and flowering stems, gradually weakening plants over a period of months and reducing vigour and seed production. The mite is invisible to the naked eye. It is present throughout the area infested by St John's wort in Victoria and has a significant impact.

The crown and root boring beetle *Agrilus hyperici* was introduced many years ago but failed to persist in Victoria. Several native insects attack St John's wort and may occasionally cause significant damage.

Biological control is a long term program, best used on large, chronic infestations with a low priority for control due to inaccessibility, remoteness or low threat of spread.

Further advice

- Contact your local landcare or friends group for further assistance and advice.
- Call the DPI/DSE Customer Service Centre on 136 186.
- Contact your local DPI Pest Management Officer for advice on local programs.
- Visit the DPI website at: <http://www.dpi.vic.gov.au> and the Weeds Australia website at: <http://www.weeds.org.au>

References

Campbell, M.H., Briese, D.T. and Delfosse, E.S. (1995) *Hypericum perforatum* L. Pp. 149-167 in Groves, R.H., Shepherd, R.C.H. and Richardson, R.G. (Eds) *The Biology of Australian Weeds Volume 1*. Melbourne, R.G. and F.J. Richardson.

Muyt, A. (2001) *Bush Invaders of South-east Australia*. Meredith, Vic., R.G. & F.J. Richardson.

Parsons, W.T. and Cuthbertson, E.G. (1992) *Noxious Weeds of Australia*. Melbourne, Inkata Press.

Acknowledgements

Compilation by Ian Faithfull and Ross Williamson.

Figures 5 and 6: Malcolm Campbell NSW Agriculture;

Figure 7: Kate Blood; Figure 1: Distribution map: John Weiss; and thanks to Goulburn Murray Landcare Network. Updated by Melanie Martin, DPI, August 2006. Chemical information supplied by Chemical Standards Branch, August 2006. Updated by Greg Johnson, DPI, September 2007.

The advice provided in this publication is intended as a source of information only. Always read the label before using any of the products mentioned. The State of Victoria and its employees do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.

Weeds spread in many ways - often hitching a ride on vehicles and machinery. Keep yours clean.