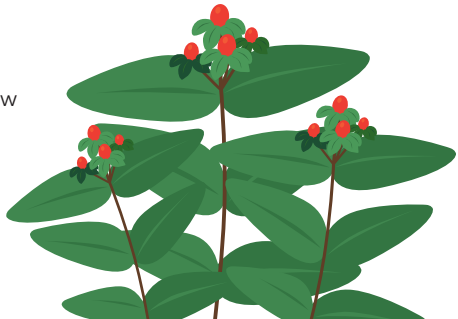
WEEDING OUT TUTSAN

horizons
REGIONAL COUNCIL

WHAT IS TUTSAN?

Tutsan is a close relative of St John's wort and is a highly invasive pasture weed.

It is spread primarily by wind, however water, birds and machinery also assist in its transfer. It's found throughout New Zealand from Kaitaia to Bluff. Severely infested areas include Ruapehu, Waikato and Bay of Plenty.



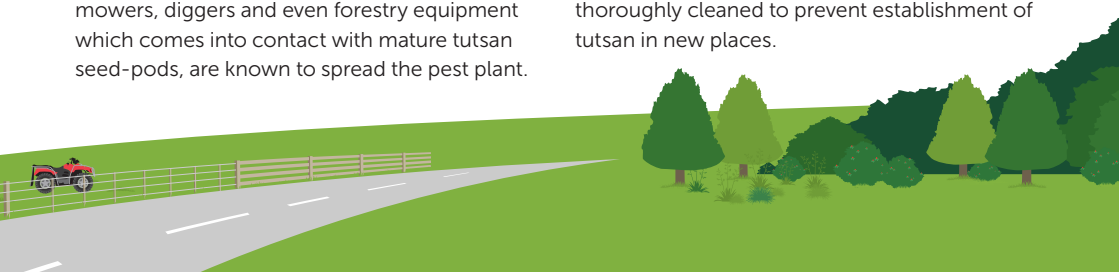
PLANT CHARACTERISTICS

Tutsan can be identified by its bright green leaves (3-15cm long), and the tips of its stems which are usually reddish in colour. It is semi-woody, semi-evergreen with fibrous roots. Use these pictures to help you identify if your plant is a tutsan weed.

FORESTRY AND ROAD MANAGEMENT

Tutsan is known as a weed of roadsides and forestry, as well as farmland, scrub and alongside waterways. Machinery such as mowers, diggers and even forestry equipment which comes into contact with mature tutsan seed-pods, are known to spread the pest plant.

Tutsan seeds are very small and pods one year old contain seeds with over 90% viability. Machinery leaving infested areas should be thoroughly cleaned to prevent establishment of tutsan in new places.



WHERE TO GET ADVICE

Your first port of call should be to the pest plant officer at your local Regional Council. You can find information in the pest directory at **www.agpest.co.nz**.

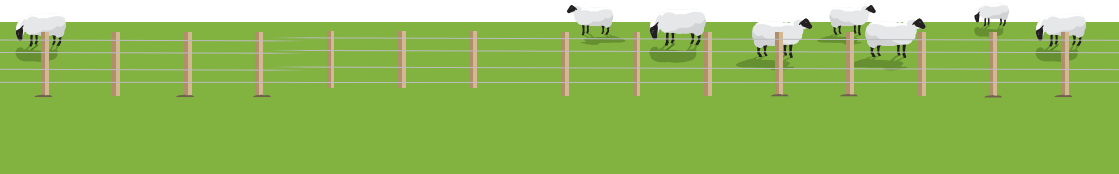
Horizons Regional Council – freephone 0508 800 800

Hawke's Bay Regional Council – 06 835 9200

Waikato Regional Council - 0800 800 401

HOW TO CONTROL IT

Preventing establishment is key as tutsan quickly builds permanent infestations once it invades hill-country pasture, fenced off areas, and along roadsides and waterways. Be on the lookout near the areas you want to protect. The goal should be stopping the establishment of seed sources that would otherwise continually reinfest cleared land. As soon as your find any tutsan plants, act to control them ideally during or just after flowering. Chemical control can work well against pasture infestations, while entrenched infestations such as those under native bush would do better under biological control.



BIOLOGICAL CONTROL

Photo: *Chrysolina abchasica* the tutsan beetle

Biological control relies on insects or pathogens from an introduced pest's home range to minimise the pest in New Zealand. They are only released after a thorough assessment of any risks they may pose to our native and commercially important species.

Biological control aims to minimise the impact of tutsan by reducing vigour and the ability to spread.

There have been three biological agents released against tutsan in New Zealand.

Photo: Lathronympha strigana - tutsan moth

1. The **tutsan fungal rust** was released in New Zealand in the 1960s but was not effective against all genetic strains of tutsan. However, it does reduce leaf area late in the season.
2. The **tutsan leaf beetle** was released in 2017 near Taumarunui and is yet to build up large numbers however there is hope its impact in Georgia will be replicated here, leaving most leaves stripped.
3. The **tutsan fruit moth** was also released in 2017 near Taumarunui and is yet to build up numbers. The fruit moth was brought to the country to reduce the seeding potential and thus prevent spread.

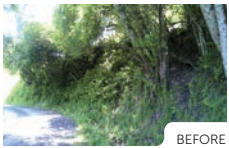
If you're interested in undertaking biological control, please contact your Regional Council to discuss what's best for your situation.

CHEMICAL CONTROL

AgResearch undertook control trials with various herbicides to provide the following information and options. Complete control is difficult as it appears tutsan is resistant to chemical translocation; treating all foliage is recommended. The root system is vigorous and control may need to be repeated.

Spot treatment

For small plants Picloram 20g and Tordon 2G Gold are effective. The use of glyphosate (Weedmaster TS540) gives very good control but sustains pasture damage.



BEFORE

AFTER

Grass friendly

For either boom, gun and hose, or knapsack use either of the products listed below, applied at 6ml/litre of water.

- Tordon Brushkiller XT
- Ravensdown Brushkiller (enhanced with the addition of Actiwett).

Following chemical control, it is advisable to raise the fertility of the area to encourage grass growth, which in turn puts grazing pressure on seedlings.

TUTSAN ACTION GROUP

Photo: Members of the TAG at the last meeting.

COMMUNITY DRIVEN BIOCONTROL SOLUTIONS

The Tutsan Action Group's (TAG) project began in 2007 when a small group of concerned Taumarunui farmers, Horizons Regional Council, and Landcare Research staff got together to consider the increasing problem of tutsan spreading through various regions in New Zealand, and particularly in the Central North Island. Chemical control does not address all infestations and a longer-term solution was sought. Funding was sought and approved from MPI's Sustainable Farming Fund (SFF) for a one year study to look into the feasibility of finding a biocontrol agent for tutsan. Two further three-year projects followed, with a total of nearly $1.3M ($1M cash +$0.3M in-kind) raised from various sources.

Photo: Tutsan rust on the underside of the leaves

Tutsan was surveyed and mapped throughout New Zealand to determine where it occurred and in what density, and what insects were already having an effect on the plant.

The survey collected material to analyse the DNA of the tutsan plants and the long established but ineffective tutsan rust already present here.

The results of these DNA analyses showed:

1. New Zealand has four genetic types of tutsan plants, with only one highly invasive;
2. New Zealand only has two genetic types of rust disease;
3. Tutsan plants in New Zealand originated from the UK, Ireland, France, Spain, and Georgia;

The world-wide science group Centre for Agriculture and Bioscience International (CABI), was engaged to survey tutsan through Europe and it was determined Georgia appeared to be the endemic range for the particularly invasive genotype of tutsan found in the central North Island. They found two insects which were not present in any other country surveyed and these were identified as good prospects for biocontrol agents in New Zealand.

The two insects, a foliage-feeding beetle (Chrysolina abschasica) and a seed-eating moth (Lathronympha strigana), both specific to tutsan, were extensively tested and subsequently approved by the Environmental Protection Authority (EPA) in 2016 for importation into New Zealand.

The first releases of both beetle and moth were made in 2017 at a public field day in Taumarunui.

By 2019, more than 30 releases of the moth and seven releases of the beetle have been made by Horizons and Waikato Regional Councils, and Auckland Council. It is expected to take some time before evidence of their successful establishment in the field can be confirmed.

Photo: November 2010 field day, Taumarunui.

This world first study of biological control of tutsan has produced several new and quite amazing science discoveries and questions, and has been of considerable interest to science institutions around the world;

1. Where tutsan occurs in New Zealand.
2. The New Zealand density of tutsan and how much of a problem it is.
3. The genotypes of tutsan which occur in New Zealand and Europe.
4. Where tutsan in New Zealand originated from in Europe.
5. The genotypes of rust which are present in New Zealand and Europe.
6. The insects which attack tutsan in New Zealand and several countries in Europe.

Photo: Measuring tutsan stand dynamics in New Zealand.

7. What the cost of tutsan is to farmers, the Ruapehu District, and the New Zealand economy.
8. What does tutsan look like and how common is it in its endemic range in Georgia?
9. The discovery of a disease of New Zealand native insect which also affects the tutsan moth.

Landcare Research plan to conduct field experiments to assess the field host range of the tutsan beetles once established at a site in Taumarunui. This field study will help us to show how accurately laboratory host specificity testing describes the host range of these biocontrol agents.

Photo: Geoff Burton, Hugh Gourlay and Elizabeth Rendell; surveying for invertebrates and pathogens on NZ tutsan; 2012.

All those involved, but in particular MPI's SFF personnel, Hugh Gourlay from Landcare Research and Horizons Regional Council, must be thanked for their overwhelming support and commitment to this project. TAG group members and all its supporters are congratulated for their considerable effort, enthusiasm and dedication to the cause over the 12 years of this project, which is hoped will ultimately benefit the NZ-wide environment.

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