

factsheet

Physical weed management:

strategically cutting Paterson's curse



P a t e r s o n ' s c u r s e

Background

Paterson's curse can produce 10 000 seeds per plant if left uncontrolled. Traditionally weeds in pastures have been controlled by grazing, herbicides or a combination of the two. More recently, spring cutting of pastures has not only been used to conserve forage and fill feed gaps but also as a weed control tool. However, it is important to realise if cutting for forage, greatest impact on a target weed may not coincide with the timing for high quality forage.

The successful use of cutting for pasture weed management relies on good timing and controlling subsequent weed regrowth and weed seed production.



Weed management using strategically timed cutting will be particularly useful when other weed management options such as herbicides are limited.

Photo: Deirdre Lemerle

Results from a pasture experiment in Wagga Wagga, NSW are discussed here. They demonstrate that by strategically timing a spring cut, it is possible to substantially reduce Paterson's curse in pastures.

Project: Using strategic cutting as a technique to manage Paterson's curse in pastures and vacant land (eg roadsides and tree lines).

Participants: Weeds CRC, and Greg and Kirrily Condon.

Location: Wagga Wagga Agricultural Institute, Wagga Wagga, and Junee, NSW.

Av. annual rainfall: 550 mm

VET sector resource: RTD5402A
Develop a strategy for the management of target pests.

Experimental site

Pasture plots were established in a degraded phalaris, cocksfoot and subterranean clover pasture. The major weeds were Paterson's curse, annual ryegrass and vulpia (silver grass). The pasture plots were cut on one of four dates during October and November, or continuously grazed by sheep (10 DSE). At the start of August, sheep were excluded from all plots to be cut. These pasture plots were cut once during spring (over two successive years) using a forage harvester (cutting height 7 cm). Sheep were excluded from these plots until mid-summer.

Effect of spring cutting on Paterson's curse

Plant density

The composition of the pasture plots changed dramatically after two years of spring cutting. Paterson's curse content was increased by 75% when the pasture was cut at a time similar to the district silage cut. This was because plants regrew and set seed and regrowth was left unchecked. Use of additional techniques such as herbicide

application and/or grazing would be required to control this weed.

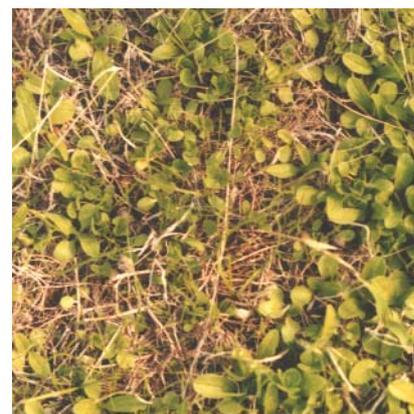
However, by cutting four weeks later, similar to a district hay cut, or by continuously grazing with sheep, the Paterson's curse content was reduced by 90%.

Seed production

Almost 1000 Paterson's curse seeds per m² were produced when the pasture was cut early (silage cut) and seed production from regrowth was not controlled. Incredibly, less than 10 seeds per m² were produced when the pasture was cut four weeks later. This was because the weed had not produced viable seed prior to cutting and no weed regrowth or seed production occurred after cutting.

Autumn seedlings

Limiting weed seed production will have a considerable impact on seedling emergence the following autumn. Cutting a pasture too early or too late in spring resulted in hundreds of Paterson's curse seedlings per m² emerging. In contrast, less than 10 seedlings per m² emerged in the correctly timed treatment (see page 2).



Cutting too early allows Paterson's curse to: regrow (left); flower and produce seed (centre); and establish at high densities during the following autumn (right). Follow-up control is necessary if regrowth occurs.
Photos: Annabel Bowcher

Timing is critical

Timing the cut to have maximum impact on Paterson's curse is critical to its success as a weed management tool. The key is to time the cut in relation to the most sensitive growth stage of the weed.

Cut too early

Cutting too early in the spring, when Paterson's curse is only beginning to flower, allows it to regrow. If the regrowth is not controlled, large amounts of seed will be produced.

Cut too late

Cutting too late in spring will increase weed numbers as large quantities of

viable seed have already fallen to the ground before the Paterson's curse is removed. The seed collected in the hay will be spread during feeding by livestock.

Cut for best results

Cutting at the most sensitive growth stage of Paterson's curse will prevent both seed production and regrowth. The critical stage of development is when the majority (75%) of plants have reached early green seed formation. This will occur approximately 2 weeks after the first purple flowers are open. This growth stage can be easily identified using the checklist on page 4.

Use in the field

The outcomes from this research have been successfully used in the field in (see case study page 3). Well timed spring cutting can be used to control Paterson's curse in ungrazed situations such as tree-lines, roadsides, lane-ways, orchards, vineyards, olive groves and recreational parklands. Excellent control relies on:

- leaving the weed population undisturbed to allow even maturity; and
- regularly monitoring the growth stage so that cutting occurs at the critical time.

Integrating techniques

Weeds can quickly degrade pastures and reduce productivity. Weed management in pastures should focus on using a combination of techniques. This integrated approach should focus on reducing weed densities and maintaining a competitive and productive pasture. Targeting low weed densities and mixing up the weed management options will result in maximum impact on the weed species.



Pasture cut too late in the previous spring had extremely high Paterson's curse content the following year (left). Cutting the weed at the most sensitive growth stage gave best results (right).
Photos: Annabel Bowcher

Case study

Greg and Kirrily Condon bought a small acreage at Junee, NSW that had a long history of Paterson's curse through basic neglect and grazing with cattle.

The area surrounding the house and driveway had been greatly disturbed during building, and high densities of Paterson's curse began to emerge. The surrounding pasture paddocks were also degraded by this broadleaf weed.



The paddock on the left has been strategically cut to control Paterson's curse.
Photo: Deirdre Lemerle

Paddock - cut too early

The Condons decided that the paddocks grazed by the cattle should be slashed in spring to 'knock-down' the flowering Paterson's curse. This was done in early October and resulted in the Paterson's curse regrowing and setting seed. The following year it was present in extremely high densities and out-competing the grasses and clovers.

House yard - a better result

The disturbed area surrounding the house and driveway was also cut using a whipper snipper in the same spring but three weeks later. Paterson's curse seed was beginning to form at this time. The cut material made a thick mat on the ground to reduce summer weed emergence and soil erosion.

The following autumn, the Paterson's curse density was greatly reduced and the annual grasses dominated.

Timing is the key to success

The Condons discussed their mixed success with Annabel Bowcher (Weeds CRC). Using the results from the Wagga Wagga spring cutting trial, Annabel advised the Condons that to reduce Pato numbers by cutting, timing was the key. They decided to cut the house yard area again the following spring at the optimal time (see checklist page 4). This cut was hugely successful

and in the following year, it was difficult to find a Paterson's curse plant.

"The most challenging part about using this strategic cutting method to manage the Pato was watching it start to flower and then not doing something about it straight away", said Kirrily.

Future use of cutting

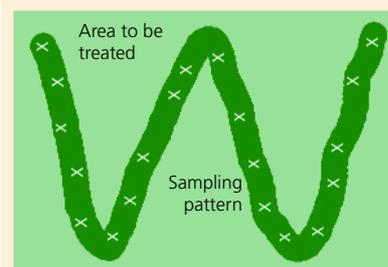
The dramatic reduction in Paterson's curse in the area surrounding the house has prompted the Condons to use the timed cutting approach this year in the tree lines, down their track and in part of the paddock. They are confident that by excluding grazing and allowing the Paterson's curse plants to reach an even maturity, slashing will have a large impact on the weed density next year.

The cutting will be used for two successive years to reduce the Paterson's curse numbers to an acceptable level. "Mowing or slashing areas on a small acreage or house block is commonly done", said Greg. "Now we have a checklist and stage of development to look for, we can time a cut to manage a weed like Pato".

Obtaining a representative weed sample

Getting the timing right relies on accurate assessment of the range of weed growth stages in the target area. Selecting the weeds at random is important to avoid biasing the assessment. The method below should be used to obtain a representative sample and make an accurate assessment (see checklist page 4).

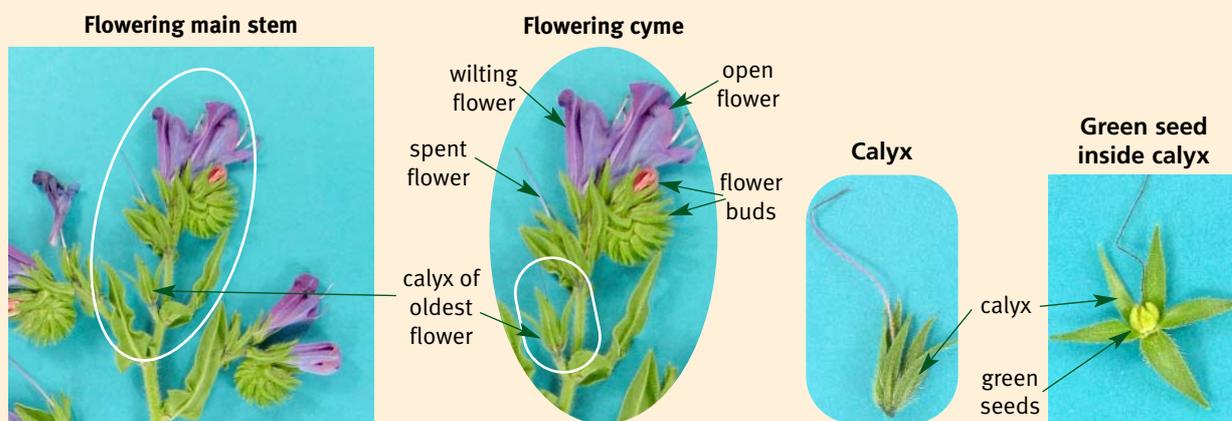
1. Walk in a W-pattern across a representative section of the area to be cut.



2. Take a set number of steps along the W-pattern (the number will vary depending on the size of the area).
3. Select the Paterson's curse plant closest to your foot.
4. Cut the main stem from the plant.
5. Cut a total of 20 main stems from plants along the W-pattern.

A simple checklist for timing a spring cut to reduce Paterson's curse

1. Do not graze or cut the weed from the end of winter, or at least two months before the cut.
2. In spring it is important to regularly check the growth stage of the weed.
3. Once the flower stems start 'bolting' from the rosettes, look weekly for the first open flowers to appear.
4. Once these first flowers open, assess twice weekly for green seed formation.
5. Randomly sample 20 main stems (use the method described on page 3).
6. Assess the oldest (first) flower branch on each of the main stems as outlined below:
 - a) Find the oldest flower on the main stem (see *Flowering main stem* below). It will be on the oldest 'cyme' located at the top of the main 'bolting stem'. (Cyme is the name given to each flowering branch on Paterson's curse and ends in a terminal flower).
 - b) The oldest flower will be the lowest one on this cyme (see *Flowering cyme* below).
7. Record how many plants have:
 - a) First flowers that have shrivelled, and petals have dropped leaving calyx (see *Calyx* below).
 - b) Green seeds forming. Look for the green seeds forming inside the calyx where the old flower petals were once attached (see *Green seed inside calyx* below).
8. When the majority of plants (15 or more of the 20 selected) have green seeds, cut the pasture. Use a cutting height 10 cm or lower for best results.
9. After cutting, check for weed regrowth and control seed set if required.



For further information visit the Weeds CRC's website: www.weeds.crc.org.au

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