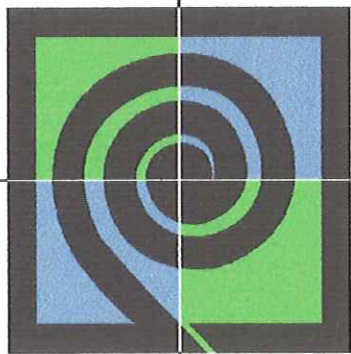


Summer — 2000-01

Protect



New Zealand
Biosecurity Institute

Protect

Summer 2000-01

Magazine of the New Zealand Biosecurity Institute

Contents

Editor's Note	5
News from the Executive	
New approach to branch activities	6
Top of the South branch reforms	6
Nets2001 update	7
Mission statement — Be in to Win	7
Subs time again	7
Member Profiles:	
John Leeuwerik	8
Helen Braithwaite	9
Terry Charles	9
Bell heather spreads in South Canterbury	10
Graham Sullivan and Terry Broughton	
Kangaroo grass jumps the fence, or one man went to mow	13
Herbicide used in battle against aquatic weed in Avon River	15
Removing the old man's beard – whisker by whisker	17
Ragwort seed viability in different soil types	19

Editor's Note

I'm sorry that the hardcopies of the spring issue of *Protect* are late arriving. The people at Monsanto in Wellington, who so kindly print and distribute the hardcopy, have been experiencing technical problems which will hopefully be solved by a computer upgrade this month.

The South Island is well represented this time around with the majority of stories coming from down here.

We have news from the Executive which has an accompanying questionnaire enclosed to help the Institute develop a Mission Statement. Please take the time to give it some considered thought as the input is valuable to the direction the Institute progresses in.

There are also a number of member profiles. The stories cover a range of developments from the reclassification of a plant as in the case of Marlborough District Council's proposal for kangaroo grass, to major research carried out over a number of years, the findings of which are summarised from the published reports, for example the trials on gel herbicides for use on old man's beard.

If you are experiencing any problems with the electronic version of *Protect*, please contact the Editor so we can straighten them out. And once again I would like to apologise for the late arrival of the Spring issue.

If you have any ideas you want included in *Protect* don't hesitate to make contact.

Col Pearson
Editor

Phone:

(03) 384-6963

Email:

col.pearson@caverock.net.nz

Postal address:

3 Pawaho Place

Christchurch 8002

News from the Executive

New approach to branch activities

For a long time some of us have been thinking that we could get a lot more mileage out of the many and varied branch activities that occur throughout the country each year.

It's a fact of life that not all our members can get to NETS every year and it would be a huge bonus if we could provide them with as many other opportunities for training and networking as possible.

Traditionally many branches have organised valuable activities but have only invited members of that branch, or sometimes neighbouring branches to take part.

From now on the executive would like to encourage you to extend an invitation to all our members. This can easily be done in two ways. If you are super organised and plan activities months in advance then a notice can be placed in *Protect*.

If you miss the deadline for *Protect* then it will still be possible to reach the bulk of our members very quickly by sending an email.

Our secretary, Dave, has an email group set up and can help you to spread the word at the push of a button (contact Dave on dgalloway@arc.govt.nz).

If you are daunted by the prospect of being overwhelmed by hordes of eager members then you could always request an RSVP and set a limit on the number of attendees. However, given the cost of long-distance travel it is unlikely that you will be inundated with out of towners.

Lets give this new system a whirl and see how it goes. You might be surprised at who does make the effort to attend and the added dimension they can bring to your branch activity!

Top of the South branch reforms

After a recess lasting 10 years, the Top of the South branch has reformed!

Mike Taylor, a marine biosecurity specialist with the Cawthron Institute, has agreed to be the chairman of the branch, and Melanie Newfield, of the Department of Conservation, the executive member. Graham Strickett managed to locate their old cheque book, and amazingly it appears that bank fees haven't been too damaging in the interim and the branch still has some funds to play with!

We wish the Top of the South branch all the best for the future.

Rumour has it that they are toying with the idea of holding NETS in 2003.



Lesley Rhodes, Mike Taylor, Lynley Hayes and Lindsay Grueber examine the *Undaria* problem in the Port of Nelson.

News from the Executive cont'd

NETS2001 Update

Don't forget to put a ring around July 18–20 in your new diaries! Robin Packe and his team have planning well under way for holding NETS2001 in Napier.

The venue will be the Napier War Memorial Centre which is located downtown right on the beach.

Accommodation, to suit all budgets, will be at a range of motels close by and a local watering hole will be nominated as a gathering point.

It's not too late to offer to give a paper — get in touch with Robin if you want to share the benefit of your wisdom with others or if you know of anyone who should be approached to give a paper. Phone Robin on (06) 844-2495, or email: robin@hbrc.govt.nz

Plans are also under way for a special mystery international guest — more on this nearer the time...

Mission Statement — Be in to Win!

As I explained in the last issue of *Protect*, the executive has recognised that we urgently need to develop a mission statement for our organisation that will guide us and help us to achieve our full potential.

What we need now is some input from you! We want to hear about all those little things that you love and hate about the Institute. We also want you to daydream a little about what exciting new possibilities the future might hold.

Please take a few moments to complete the questionnaire enclosed with this issue, and return it to the Executive before the end of March, and you will go in a draw to win prizes including two free memberships for a year and two bottles of wine.

Once all your feedback is in, Keith Crothers, Helen Braithwaite, and myself will draft a mission statement. If you would also like to be involved in this important task, please let me know.

The first draft will not be perfect and we will be asking for your help again at NETS to work on these words until we have something that inspires and motivates us.

And a healthy constitution

Recently, Keith Crothers, Noel Procter and myself reviewed our constitution and decided how we can update, simplify, and generally improve this important document.

The new and improved version will be circulated prior to our next AGM in July, at which time we will put it to the members for adoption.

Subs time again

A reminder that subs became due again on January 1.

We would be very grateful if could please pay promptly when you receive your subs notice or tell us if you wish to resign. That way treasurer Ken Massey doesn't have the miserable task of endlessly hounding non-payers.

If your organisation pays your sub and your accounts people send Ken a bulk cheque, please ask

them to include a note explaining who is covered by the cheque.

Once you have paid up, you can expect to receive one of our fancy new membership certificates with your name on it!

Bye for now
Lynley ☺

Member profile: John Leeuwerik

Officer on the move

I arrived in New Zealand on February 5, 1975 with a heart full of hope, dreams and aspirations.

Before too long I took up hunting and running. Luck came my way when I managed to obtain a bach at Loch Katrine between Lewis and Arthur's passes. Most of my leisure time was spent up there in that beautiful area. Then, in 1980, I got a job with the North Canterbury Nassella Tussock Board in Waiiau, eventually being transferred to Waipara.

I soon learned that most Kiwis are insane, so in 1989 I took out New Zealand citizenship.

During the past year or two there have been one or two light-hearted moments. One that comes to mind occurred quite recently when I had to race round a vineyard to escape the attentions of a lady who was intent on showing me her pink-petalled Kakabeak flower!!

Another interesting experience that comes to mind occurred in our first season of helicopter inspections for nassella compliance. This is an exhilarating way to undertake inspections but it occasionally has its drawbacks. Flying one day in a stiff nor'wester, I was soon made aware that one of my colleagues had breakfasted on 20 or so sausage rolls doused in a liberal coating of runny tomato sauce.

We hadn't been in the air long when my offsideer threw up and just like in the space shuttle 10 sausage rolls floated in the air before slamming into the window and sliding down in a trail of tomato sauce. Another retching heave saw the other 10 deposited into a grocery bag. On landing to have lunch my colleague produced a bag very similar to the one he carried on the helicopter which contained 10 sausage rolls. He then produced another shopping bag which also contained 10 sausage rolls. His difficulty arose when he could not tell the contents of the bags apart! However he proceeded to eat his lunch quite contentedly and I can only assume he got it right!

One time while standing on top of a hill talking to a farmer, I was bitten on the rear end by an over

eager young pup. Far from showing his concern for my freshly tenderised posterior, the farmer turned his sympathy on to the mongrel that was obviously in agony after his first taste of Dutch buttock. The last I heard was that the dog succumbed to a very weird strain of Dutch Elm Disease. Incidentally, the cost code for this event was K9-byte!



Departing Biosecurity Officer John Leeuwerik gives last minute advice to colleagues about harvesting broom seed beetles!

It is truly amazing that 25 years have passed since I first arrived. Now I am going home to Holland to be able to spend time with my family. Maybe one day I will be back, but for now I wish you all the best and thank you for being good colleagues.

John Leeuwerik

Member profile: Helen Braithwaite

I am the Canterbury representative on the national executive. My voice gives me away as not being a genuine Kiwi, although I did spend my teenage years here.

In 1995, I returned to New Zealand. I then started working for Wellington Regional Council on the Wellington City Old Man's Beard project and was promoted to the job of biosecurity officer for the Hutt Valley.

I moved to the Department of Conservation in 1998, working first in Wellington and then moving to Christchurch. While I have been working for DOC, I have written

a weed surveillance plan and trained DOC weeds staff. Now I am revising DOC's standard operating procedures for weeds work.



Helen Braithwaite

I hope that the Institute can help us in our work by connecting people from different organisations and helping members to share information and ideas. I find it interesting being involved in the Institute in these times of change.

My leisure activities include sailing, tutoring adult numeracy, and volunteer weeds work at Travis Wetland.

Helen Braithwaite

Member profile: Terry Charles

I am 42 years young with a history in the pest control field in which I have spent most of my working life. My father was a rabbitier at various locations throughout the South Island before becoming involved with nassella tussock in 1973 with the North Canterbury Nassella Tussock Board.

I was employed in the nassella gangs for approximately two years from 1974. In 1977, I began employment with the Pest Destruction Board. For the next 17 years I worked for the Waikari Pest Board which later became the Ashley-Waikari Board after amalgamation and was then absorbed into the regional council.

I had a break of 18 months in 1989 when I moved with my family to Queensland to make my fortune as a tree copper. However the lifestyle (What... not the pay packet?) of a pest control operator drew

me back. I became self-employed as an animal pest and nassella tussock contractor in 1994.

With the introduction of Rabbit Haemorrhagic Disease and cutthroat competition for Animal Health Board TB contracts it became more and more difficult to get continuity of work. When the vacancy for a biosecurity officer arose in Amberley I jumped at the opportunity (and here I am for better or worse!).

I have been involved with North Canterbury Land Search and Rescue for the last five years. My sporting interests include chasing the odd deer or pig, fishing and up until recently, multi-sport events i.e. triathlon. Due to a running injury I now hope to become more involved in mountain biking having just purchased a new bike.

Terry Charles

Bell heather shows up in South Canterbury

**By Graham Sullivan
and Terry Broughton**

The development of a control strategy is suggested for bell heather, *Erica canerea*, before eradication is unachievable.

Background

In early February 2000, Environment Canterbury staff observed a purple-flowered plant in the snow tussock zone on Bluecliffs Station, South Canterbury.

Landcare Research identified the plant as *Erica cinerea* or bell heather. It is not a plant pest in the Regional Pest Management Strategy.

Bell heather was first identified on Bluecliffs Station in 1943 where there had been a deliberate attempt to naturalise the species. It is the only known infestation of this plant in the South Island. It can be found on the volcanic plateau of the North Island where along with another heather species, *Calluna vulgaris* it has infested thousands of hectares and is now a major environmental problem.

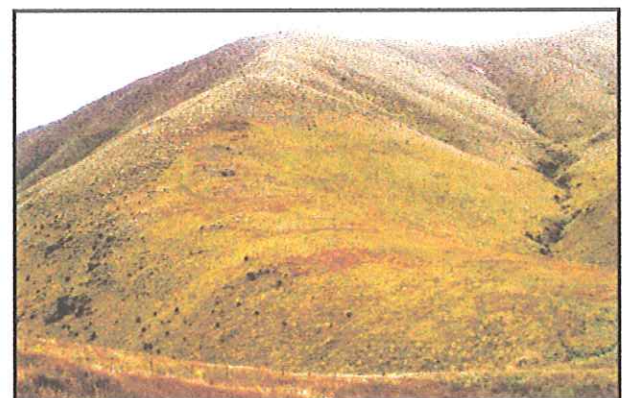
A decision was made to quantify the area of bell heather infestation on Bluecliffs. This was undertaken on foot using GPS to record the locations of 'outlier' plants. The area of infestation involves 368 hectares and has spread to an adjacent property north of Bluecliffs. This adjacent property is known as Babers Block and is part of Westacombe.

The area of infestation is rectangular in shape running NW to SE for approximately 3.1 kms and is approximately 1.2 kms wide. Plants can be found at altitudes between 650m and 1000m on both north and south-facing aspects. Plants are occupying bare rocky sites as well as competing successfully with native species such as flax, *Dracophyllum* and snow tussock (*Chionochloa*). In some instances the heather is growing in the centre of these species.



***Erica canerea* growing in competition with native species.**

Photos: Graham Sullivan.



Typical country in which *E. canerea* is growing in the Hunter Hills, South Canterbury.

Rob McCaw, Biosecurity Team Leader, Central Area, formerly a noxious plants officer with Waimate District Council, confirmed the bell heather infestation had spread and plant density had increased considerably in the last 10 years.

Botany

Small shrub, sometimes very low and mat forming, but often straggling with stems to c.30cm high. Shoots puberulent. Leaves usually in whorls of three, sometimes opposite, 3-6mm long, revolute with contiguous margins concealing lower surface, glabrous except for ciliolate apparent margin. Petioles very short. Flowers in terminal racemes, sometimes appearing umbellate. Pedicels c 3mm long, densely puberulent. Bracteoles resembling sepals and closely overlapping them. Sepals 2-3mm long, ovate or lanceolate-ovate, glabrous except for ciliate margin, similar in colour to corolla; apex acute. Corolla c.6mm long urceolate, purple, rose, pink or occasionally white, glabrous; lobes less than 1mm long, triangular-ovate, becoming patent. Stamens included; anthers c.mm long deep purplish with crested appendages. Style equal to or slightly extended from corolla tube; stigma capitate. Capsule c. 1.5mm long globose, glabrous. Flowers December to February.

Seed Viability and Dispersal

Seed Longevity:

At least 5 years and up to more than 30 years.

Mean Seed Density:

1000 - 3000/m² down to a depth of 5-20cm

No of seeds per plant: 1000 - 10,000

Germination: In light or partial dark

The primary means of seed dispersal is by wind (P Williams, ecologist, Landcare Research pers comm) but dispersal can occur by animal, human, or vehicle movement (N. Singers, botanist, DoC; pers comm).

Control

Heathers are a difficult species to control with chemicals. However, the logistics associated with other forms of control and the need to leave the soil and non-target species undisturbed to minimise

further seed germination leaves no practical choice other than a selective chemical treatment.

Chemical trials that have been conducted in Tongariro National Park on *C. vulgaris* indicate that both Hi Ester 2.4-D or Tordon Brushkiller with boost penetrant are producing 80-90% kill rates.

There is no known biocontrol agent for bell heather. A biocontrol agent does exist for *C. vulgaris*, but it is specific to that species only.

Discussion

It appears that the infestation of bell heather in the Hunter Hills has increased significantly in density, plant vigour and area over the past 10 years. This follows a 40 to 50-year period of slow establishment and low abundance in a confined area. This period of low abundance followed by rapid spread is usually explained by two main contributing factors:

- lag phase and/or
- environment change.

When a species is first released, numbers increase slowly until a 'critical mass' is reached. From this point numbers can increase rapidly and exponentially. The period of time from release to critical mass is termed 'lag phase'.

We understand that bell heather has been present on Bluecliffs Station for c. 50 years. According to Peter Williams, ecologist Landcare Research, 50 years is a typical lag phase for a woody plant species.

Any environmental change that favours a species can also result in increased incidence and spread. In this instance we are aware that farm management on this particular property has placed a greater emphasis on cattle and less on sheep over the last 15 years.

The council has two options to consider; ignore/do nothing, or implement a control strategy. To do nothing is likely to result in all suitable habitat in the Hunter Hills becoming infested over time. Suitable habitat for bell heather is not limited just to the Hunter Hills but includes other areas throughout Canterbury.

There is also a risk of inadvertent spread by humans. Like the many other species of *Erica*, bell heather is an attractive flowering plant suitable for

domestic rock gardens. While the risk of human spread is currently low due to the infestation being located on private land, that risk will increase, as the plant inhabits a larger area.

The common advice received from scientists and biosecurity staff involved with the heather problem elsewhere in New Zealand is to initiate a control programme without delay. In 1987, *C. vulgaris* infested 200 hectares near Waiouru. This was not considered to be a problem at that time but today the infestation extends over 12,000 hectares and the option to eradicate the plant is gone.

The well-documented infestation of the same species in Tongariro National Park, which now involves a massive area, was still considered to be controllable as late as the 1960s.

Based on the advice received, it is our opinion the infestation in the Hunter Hills is already approaching the limit at which eradication remains a feasible option. A containment or preferably a progressive control approach would result in an immediate and measurable reduction in the area of infestation.

Related matters

During the course of this investigation it came to our attention that another species of *Erica*, is present in Mt Cook National Park. *C. vulgaris*, as we have already mentioned, is a major environmental problem in the central North Island. There are no other known infestations of this plant elsewhere in Canterbury.

We have discussed this issue with Department of Conservation staff based at Mt Cook. They advised

that there are four separate sites located near the Hermitage and in the lower Hooker Valley. All known plants totalling around 300 were sprayed this year. DOC confirmed that they had an annual spray programme in place for controlling *C. vulgaris*.

News Flash!...News Flash!

New find of *Erica* sp. in the Mackenzie Basin

While combing the hills on a recent inspection, a small heath-like plant was discovered along part of the Ohau Canal, Mackenzie Basin. After a short but careful stalk by an alert Biosecurity Officer, the plant was tackled, a brief struggle broke out and lasted several seconds, before the offending plant was subdued and escorted back to the office for formal identification.

Initially, only three plants were discovered in the area. Murray Dawson from the Landcare Research Plant Identification Service determined that the sample provided showed taxonomic characters that most likely suited *Erica camea* and is a new record not listed in *Flora 4*.

On returning to the site with eradication in mind, the officer discovered more than 30 plants spread over three kilometres. They are all to be sprayed once Meridian Energy has given approval.

Reprinted with permission from
Environment Canterbury *Bioscene*

Kangaroo grass jumps the fence, or how one man went to mow

In spite of being in the region for 30-odd years, Trans-tasman accidental import kangaroo grass' recent spread in Marlborough's Wairau Valley is seeing it gain new status as regional plant pest.

The spread of kangaroo grass (*Themeda triandra*) on the roadsides of Marlborough has prompted Marlborough District Council biosecurity officers to propose a change in the species' pest status for the region. MDC biosecurity is working on a proposal to designate the species a regional plant pest.

Although confined to nine properties in the region, Ben Minehan said that over the last year, patches of kangaroo grass have shown up on the roadside up the Wairau Valley as far as the Wye River. He said roadside mowers were the mode of seed transmission. "We've known about the mower for six months or a year because isolated patches of kangaroo grass were showing up miles away from where the patch site was – that's how we worked it out." Mowers are not the only seed distribution mode for the species – the seed is very easily picked up by stock as well, although it's not aggressive like Chilean needle grass or nassella. Concerns were raised about the spread of the species at meetings and through a submission to the council.

Kangaroo grass is a hardy native of Australia where it is grown for a stock food in large blocks as large as 400-500ha. While the juvenile contains only a quarter of the metabolic energy of ryegrass, the adult has only a ninth the energy of rye – like eating cornflakes according to Ben Minehan. In Australia it is managed by burning to remove the adult grown and when the juvenile plants come away again they graze it until the plants mature – a management regime not applicable in New Zealand, Ben Minehan said.



The discovery of isolated patches of kangaroo grass (*Themeda triandra*) on roadsides up the Wairau Valley rang warning bells for local biosecurity officers and indicated a new seed dispersal mode was in use which turned out to be — road verge tractor mowers. Photo: Ben Minehan

He said it was believed kangaroo grass was an accidental import from Australia in the 1970s and now there were two areas of infestation – the 80ha site in the Wairau Valley, and a lesser one of 32ha in the Redwood Pass/Dashwood area, south towards the coast in the area which was burnt over Christmas in Marlborough. Although the two patches have gradually increased in size over the years, the new roadside discoveries have brought about a change in thinking.

Together with the new regional plant pest status Ben Minehan is developing a containment management regime under which the current

kangaroo grass-infested properties are divided into a group of five core properties, and a second group of four non-core properties. Transit NZ and Transrail are both occupiers of land that has infestations. Ben Minehan said that on the core properties all plants growing within 5m of an adjacent property have to be removed. On the non-core properties, occupiers will be required to destroy all plants before they seed. "The objective is to prevent any increase in the distribution of kangaroo grass and to reduce the level of infestation on infested properties with the exception of the core properties by 50% by 2006."

He hoped that over the next few years the knowledge of the species and its management would increase. "On the core properties we are looking at improved land management techniques to try and do something with it rather than pouring chemical on huge areas. Really we don't know a lot about the plant yet to really point to which direction we head where those infestations are really big, so we have to learn as we go along. It's going to be a bit of a process over the next two or three years until we get an idea of exactly what the results are going to be."

Action has been taken on the new patches of the grass that have shown up up the Wairau Valley. "Transit NZ have actually been through and sprayed it even though there was no legal requirement for them to do it. They've put their contractors through and they did an excellent job," Ben Minehan said, as testament to the "excellent" attitude both Transit NZ and the local road authority, Marlborough Roads, has to plant pests. Other control methods that have been tried are grubbing of isolated plants and the

use of chemicals on larger patches. "We've tried Roundup and it seems to have killed it all right but we're still investigating what's going to come away after the kangaroo grass disappears – what sort of regrowth we are going to get."

Ben also says that the district's biosecurity officers are keeping an eye on the second area of kangaroo grass in the Dashwood area that was burnt in the fires at Christmas time.

"In the big burnt area of Marlborough, that area of kangaroo grass got really heated, so basically it's down to ground level now. We are just waiting to see what happens when we get some rain to see what sort of strike we get.

"Things are just starting to strike away out there now. A few broad-leaf weeds that are quite tough are coming away. But we need some rain and until we get rain it won't really flush. I hope the first thing through is not nassella and kangaroo grass but there's a good chance it will be."

The process of designating the plant species is well advanced with a lot of support coming from the land owners. "The word is in the community is that they want to see it contained because it's got a lot of potential in Marlborough – it'll thrive on any of that dryland country," Ben said.

The first round of consultation is almost complete and the writing up of the proposal is under way and will go out in by March. Following that is a second round of consultation with Ben Minehan expecting the proposal to be adopted sometime in July.

Herbicide used in battle against aquatic weed in Avon River

Careful monitoring is under way to measure the effectiveness and toxicity of herbicide treatment on Christchurch's Avon River

Chemical control has commenced on the aquatic weed, *Egeria densa*, in Christchurch's Avon River with the first application in mid-January of diquat to the lower reaches of the river below Kerrs Reach.

Christchurch City Council Green Space Maintenance team leader Chris Rance said that they were now waiting for results of post-application surveys and monitoring work undertaken to both gauge the effectiveness of the application, and its impact on the environment. The council's resource consent requires the section of the river where the chemical is applied to be closed to all use for 24 hours.

"From our observations, there seems to have been some success with it, but until we do the detailed underwater stuff we won't be sure about that," Chris Rance said of following the herbicide application. "It's offering the only prospect of management of this stuff that we've got at this point," he added.

He believes the tidal nature of the Avon's lower reaches presents something of a new scenario for chemical application due to flow reversal and higher salinity levels, issues which will be looked at in the trials. Both the gel and liquid forms of diquat were sprayed on the water surface from boat-borne booms, to sink through the water column onto the

The following extracts are from Environment Canterbury's *Egeria* pamphlet.

What does it look like?

Egeria is an aquatic plant with dark green leaves. It looks similar to the widespread Canadian pondweed, but it is significantly larger.

The leaves of *Egeria* are up to 40 mm long and 2-5 mm wide. The leaves join onto the stems in groups of 4 or more, lower leaves may arise in 3's.

The stems are much branched, 3 mm in diameter, and they break easily. The flowers have 3 white petals.

Where is it?

Egeria is widespread in the North Island and also occurs in the Blenheim area.

It has only recently been found in Christchurch and is currently

known to occur in the stretch of the Avon River between Kerrs Reach and Avondale Bridge.

Potential for spread

Egeria can live in both still and flowing water. It prefers high nutrient conditions. The plants can reproduce from very small (10 mm) stem fragments if they include a lateral bud. In New Zealand, all reproduction of *Egeria* is by vegetative means, since only male plants are present.

One of the ways that *Egeria* fragments can reach new areas is when people transfer equipment such as boats or nets from an area that already has *Egeria* to an area that does not.

Emptying of fish tanks into waterways is another potential source of plants.



Photo showing the comparative sizes of *Egeria densa*, on left and Canadian pondweed, right. Tape measure showing mm.

plants plants on the bottom. "We tried both the liquid, Reglone, and the gel, Torpedo, forms of diquat. The gel form is recommended for lakes as it goes down, dropping through the water column and sits on the growth. But because we are in the situation in the Avon where we have flow reversal due to tide, NIWA suggested we try that because it would act as a slug in the river and move up and down."

The site of the *E.densa* infestation is right at the edge of the salt water wedge that moves up and down the river with the tide which is unusual and presents its own problems. "diquat doesn't particularly like salinity nor sediment in the river, so we're really on the edge of whether it will work or not."

Similar chemical control has been used elsewhere in New Zealand, particularly around Rotorua where Chris Rance believed it had been used for 30 years, by hydro-electricity producers to control weed in canals, and on the Opawa River in Blenheim where it is used on the same weed species as in the Avon River. "It's been subject to quite significant research and resource connect processes, so we weren't breaking new ground really."

A report on the monitoring will be completed by the end of February with the possibility of a second application before the [native New Zealand fish] inanga season starts in April.

As part of the monitoring, temperature and salinity are being measured and recorded. Eels that have been kept in cages in the river during the chemical applications are also being dissected to gauge diquat's impact. "The other thing we were doing was checking the toxicity of the water to see if we could reduce the length of closure. . . . It's our understanding that in practical terms the toxicity of [diquat] disperses very rapidly."

Over the last year since *E. densa* was found in the Christchurch waterway, the council has tried suction dredging and laying mats over the plants in the hope of smothering them. Eradication of the plant pest seems to be out of the question, according to Chris Rance. "We're really trying to maintain it, to stop it spreading. The potential if it does spread is quite serious. You can imagine whitebaiters from here could travel to the West Coast and you'd have Lake Brunner full of the stuff without any trouble at all."

Removing the old man's beard — whisker by whisker

Thorough research shows that effective targeted control of old man's beard is achievable using picloram gel applied to the vine's cut stems as shown by research undertaken in native bush in the central North Island over a period of years by a pair of Horticulture and Food Research Institute scientists.

The search for an effective method of controlling the smothering habits of old man's beard (*Clematis vitalba*) in a way that doesn't involve the blanket spraying of herbicide has been brought a step closer thanks to the work of two Ruakura scientists written up in the New Zealand Plant Protection Society's journal.

With resistance building to blanket foliar spraying, and the need to control overspray, damage to non-target plant species, human health, and the impact on local ecology, a more tightly targeted and effective herbicide application method to control old man's beard is needed.

B G Ward and R F Henzell carried out extensive and long-running trials into the most effective type of herbicide, herbicide concentration and time of year to apply it, on old man's beard vines in native bush in the Taihape Scenic Reserve.

Having done work earlier on the use of herbicidal gels on cut stems, the pair choose this application method for three trials: on efficacy in late spring 1995, again on efficacy in winter in 1996, and on management in late spring 1997. The authors say that gels have advantages including: adhering to cut stems, direct absorption into the plant of the active ingredient, and as they come already prepared they do not require the operator to mix or handle concentrated chemicals. Gels also contain sufficiently high, and therefore effective, concentrations of the active ingredient to allow effective weed control in areas that are only occasionally visited (once every 3-5 years).

In the first efficacy trial undertaken in late November 1995, 20 treatments made up of a range of concentrations of six herbicides were each applied in the Taihape Scenic Reserve to the 30 cut stems of old man's beard in groups of 10. Out of a line up of chemicals that included picloram, Tordon 50-D (picloram and 2,4-D), triclopyr, metsulfuron, sodium chlorate, and phosphorous acid, it was the 4% and 1% concentrations of picloram that killed 100% of the canes when treatment effects were observed 11 and 17 months after application. The only other herbicide that approached the same level of efficacy was Tordon 50-D that killed from 57% to 80% of the vines depending on the concentration.

In the second trial carried out in late August 1996, 21 gel treatments were applied, again in the Taihape Scenic Reserve in the same pattern, close to the site of the first trial. However in this case sodium chlorate was dropped out of the chemicals tested and a wider range of concentrations of Tordon 50-D was included. When treatment effects were observed 7 and 24 months after treatment the researchers found that, "the 4% picloram gel treatment was the only effective treatment" but at a successful kill rate of 73.3% of stems it was less effective than in the late spring application.

The last trial, done in late November 1997 again in the Taihape Scenic Reserve, gel solutions of 5% and 1% picloram were applied to stems, and as well as periodic visits to check on impact of the gel on the surrounding plants, results were assessed 14 months after treatment. Ward and Henzell found

that the 5% picloram gel achieved a 98.8% kill rate while the 1% gel was lower at 81.2%. In this trial all the gels were absorbed into the stem within two hours of application, thereby minimising impact on the surrounding ecology.

In the report the authors state that in the first assessment of the picloram gel treatments carried out in late spring (first efficacy trial), the vines had died back up to 5m from the treated end and the roots were decaying and could be pulled out easily. After 17 months, most of the treated dead canes were lying on the ground.

They also stressed the need to maximise the effectiveness of the treatment — hence the use of 5% picloram gel — as the effort involved in getting to the vines in dense bush was usually more

time consuming than the time taken to treat the vines. The treatments were done by Department of Conservation staff using propriety TIPIT gel pruners and for the larger vines, a pruning saw.

For complete containment of old man's beard, follow up treatment of seedlings would be required. Ward and Henzell also noted that typically only 60 to 90% of the vines in a particular area were found and treated in the first pass due to the difficulty of locating them in thick bush, necessitating the need to undertake a second treatment.

Ward and Henzell's article, "Herbicide gels for controlling old man's beard (*Clematis vitalba*) in ecologically sensitive areas" is published in *The Proceedings of New Zealand Plant Protection Society* 53:pp284-288 (2000).

Ragwort seed viability studied in different soils

Ragwort (*Senecio jacobaea* L.) seed remains viable for a long time when buried at a range of depths in a variety of soil types, according to research carried out by two AgResearch scientists based at Ruakura.

TK James and A Rahman found that the ragwort seeds took at least 10 years to reach a less than 1% germination rate when sprouted after being dug up, and in some soils they predicted deeply buried seed (19-21cm) could take up to 18 years to reach the same low level of germination. Generally more deeply buried seed remained viable longer.

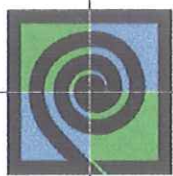
The longevity of the ragwort seed buried shallowly in the soil is different from the results that the authors and others found from similar studies carried out on nodding thistle (*Carduus nutans*) and giant buttercup (*Runnuculus acris*) for which the seeds dissappeared more quickly near the surface

while retaining viability at depth similar to the ragwort trials.

The researchers suggest this finding has significance for management and control of ragwort as seeds are the principal means of spread with an adult plant producing up to 300,000 seeds most of which fall within 2m of the parent, as even after removal of the source of fresh seed, the presence of viable seed in the soil raises the likelihood of a reinfestation occurring if sites are not monitored and retreated if necessary.

The study was carried out in the Waikato with the seed being buried at four sites each with one of Horotiu, Dunmore, Hamilton and Rukuhia soil types but with a similar climate.

TK James and a Rahmans' article, "Longevity of ragwort seed in four soils", is published in *Proceedings of the New Zealand Plant Protection Society* 53:pp253-257 (2000).



New Zealand
Biosecurity Institute

Mission Statement Questionnaire

Please take some quiet time, when you know that you won't be interrupted, to think about and answer the following questions. Before you begin take a moment to clear your mind of everything else.

Name:

Branch:

-
- What Institute activities or achievements do you consider have been of greatest worth?

 - The things I value most about the Institute are...

 - What skills or talents do our members have that we are not using well?

 - Expectations of the Institute that have not been fulfilled for me so far include...

 - The areas that the Institute should put most of its resources into are...

● If the Institute had unlimited resources it might also...

● Possible goals that the Institute could have might be...

● Possible roles that the Institute could have might be...

● The greatest contribution that the Institute could make in the future might be...

● Any other comments/ideas?

Thanks for taking the time to do this!

Please mail your completed questionnaire

to:

***Lynley Hayes,
Landcare Research,
PO Box 69,
Lincoln***

before April 1, 2001.

***All respondents will be put in a draw to
win prizes including two free member-
ships for a year and two bottles of wine!***
