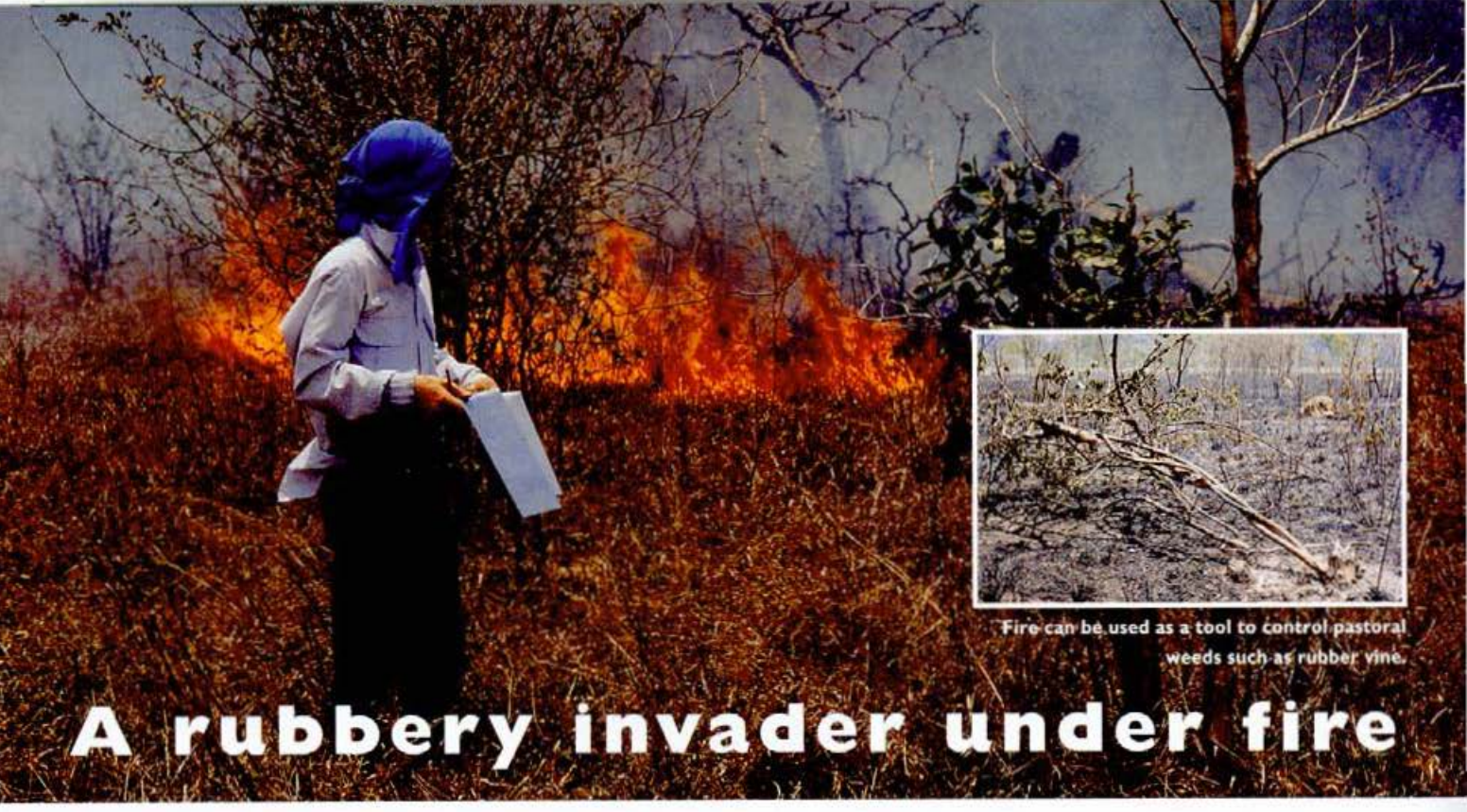

Fire can be used as a tool to control pastoral weeds such as rubber vine.

A rubbery invader under fire

Grass fires may be the key to containing one of the northern savanna's most destructive pests, according to ongoing research by CSIRO's Division of Tropical Crops and Pastures.

Since its introduction from Madagascar as a garden plant more than a century ago, rubber vine has infested about 350 000 square kilometres of open woodland between the Gulf of Carpentaria and Brisbane, (about one-fifth of the state) and it is poised to invade the Northern Territory.

Rubber vine (*Cryptostogia grandiflora*) favours sensitive riparian (riverside) habitats, where it climbs and smothers even the tallest trees to rapidly wipe out native vegetation. On pastoral plains, free-standing clumps of the vine reduce grass cover, provide refuge for feral pigs and hinder cattle musters.

Given the scale of the problem, scientists recognise that chemical and mechanical methods of rubber vine control bear economic and environmental burdens of their own. But now they may have a new weapon in their arsenal.

Since 1993, Dr Tony Grice, a research scientist at CSIRO's Davies Laboratory, has been studying the feasibility of using fire to control woody weeds on nine, 1.3-hectare plots on Lansdown Research Station, 40-kilometres west of Townsville.

By torching three plots once only, burning another three twice in consecutive years and leaving the remainder unscalded, Grice has monitored the effects of fire on plant and seed survival, reproductive capacity and growth rates of woody weeds.

The results have been promising. A single fire killed 96% of small rubber vine plants (less than 50 cm high), 84% of medium-sized plants (50-150 cm) and 50% of large plants.

'A 50% mortality is quite significant given that fire can be employed relatively cheaply on a large scale,' Grice says.

The study also confirmed that a year after the first burn, groundcover had recovered sufficiently to sustain a second blaze, which virtually eliminated rubber vine on these plots while sparing most eucalypt species.

Unfortunately, the burns also seemed to spare the chinee apple (*Ziziphus mauritania*), another invasive woody weed which poses serious problems for pastoralists and conservationists. The chinee apple suffered negligible effects in terms of mortality, growth rate and reproductive output.

During the burns, Grice collected data on meteorological conditions, fire speed, fuel load, vegetation type and moisture content in order to 'build up a picture of what sort of fire we can expect under different conditions'.This information, combined with knowledge gleaned about the post-fire ecology of woody weeds, will aid development of a model to predict appropriate burning regimes for effective land management.

Rubber vine invasions tend to be patchy in terms of both time and space. A knowledge of their ecology is crucial to the timing and location of weed control, Grice says.

Unlike other woody invaders of the tropical savanna, such as prickly acacia, mesquite and chinee apple, rubber vine seeds are dispersed by wind rather than by animals. (Chinee apple, for example, was also introduced in the late 1800s, but occupies only 1500 km^2.)

Rubber vine infestations inevitably progress from low density to high density and are best tackled as soon as possible.

Support for trees

THANK YOU for including an article on our book *Trees for saltland: a guide to selecting native species for Australia*, in the summer 1995 edition of *Ecos*. I wish to advise you of an inadvertent omission in the article. The financial support for printing this book was provided by the RIRDC/LWRRDC Joint Venture Agroforestry Program and we are grateful for this. This program has also sponsored our research concerned with evaluation of salt and waterlogging tolerance within two commercial eucalypt species, *E. globulus* and *E. grandis*.

The RIRDC/LWRRDC Agroforestry program is developing ways to use agroforestry for the combined purposes of commercial timber and tree products, increasing agricultural productivity and sustainable natural resource management. Recently the Forest and Wood products Research and Development Corporation has become the third sponsor in the program. Total funding for this program is $3 million over five years. The program is managed by Dr Roslyn Prinsley at RIRDC.

Nico Marcar, CSIRO Forestry and Forest Products

Seabirds, polluters of the waterways

Birds, wildlife and domestic animals are contributing to the contamination of Australian waterways at previously unrecognised levels, preliminary studies by CSIRO Oceanography have revealed.

The studies were carried out in New South Wales and Tasmania as part of a broader program that is monitoring Australia's marine environment. They involved new techniques developed at CSIRO Oceanography which use organic compounds called faecal sterol biomarkers to determine the sources and amounts of faecal matter found in waterways.

Rhys Leeming and Dr Peter Nichols of CSIRO Oceanography undertook the biomarker studies in collaboration with CSIRO's Division of Water Resources and Australian Technologies in Sydney.

The NSW study (for the Wyong Shire Council) was the first time the technique had been applied where there was a likelihood of pollution from multiple sources in both urban and rural catchments. It found that in Lake Tuggerah as much as 80% of faecal pollution after rains was from sea birds. The second highest contributor was domestic animals at about 15%. Rural catchments contributed the remainder of the faecal contamination, which came from sheep, cows and horses and native animals such as kangaroos. In this study, human faecal contamination was either negligible or below detection.

Leeming says the same technique is soon to be applied to Melbourne's Yarra River in a collaborative study with the Victorian Environment Protection Authority. Previous samples taken in some Melbourne streets and stormwater drains had indicated the presence of human sewage. The new technique will distinguish between different sources of faecal pollution.

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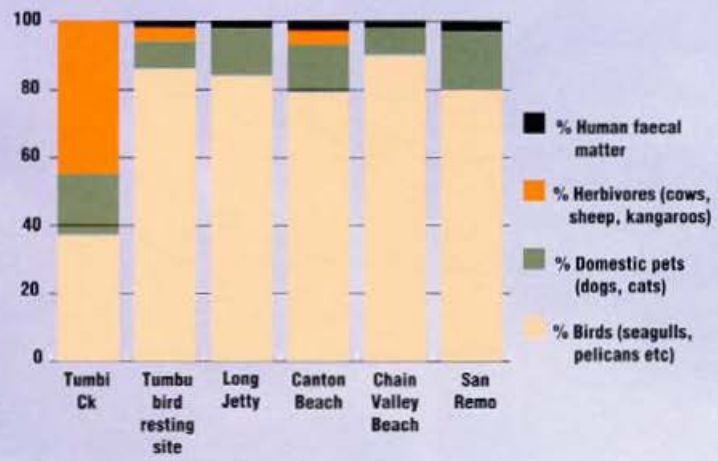
Craig Macaulay



Not only do smaller plants die more readily from fire, but established stands prevent grass growth and reduce the potential fuel load.

Grice's work forms part of a broader project which aims to exploit key ecological aspects of woody weeds to reduce their damage to the economy and the environment. The project is a collaborative effort with the Queensland Department of Lands and is largely funded by the Meat Research Corporation.

While research on biological controls is showing some progress, Grice suspects any effective management strategy will rely on a combination of control measures.

'Fire is primarily a candidate in non-riparian habitats, where rubber vine tends not to be at its densest, but which is still most of the landscape we are interested in,' he says.

More selective techniques, including hacking and spraying herbicides, would remain the method of choice along river systems.

In the long run, Grice expects that the use of grass fires as a pastoral weed control will complement a push by conservation agencies to employ fire as a means of preserving habitat. But he cautions that it could be wrong to blindly extrapolate results stemming from his 12-hectare patch to the entire tropical savanna, in part because annual rainfall varies across the north.

'Land management goals vary and it's a matter of tailoring fire to particular land systems,' Grice says. 'We know we can use fire as a tool, but we need to know when and where to use it.'

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