

Research attacks the Lippia weed problem

The Cotton CRC has lent its support to local government attempts to counter a widespread invasion of Lippia weed, one of the most devastating weeds in the Murray Darling Basin (MDB). Currently there is no viable or practical control.

Guy Roth, CEO of the Cotton CRC, said Lippia reduces the stocking potential of large tracts of grazing country and reduces the natural biodiversity of floodplains and riparian zones. It also causes riverbank slumping which leads to erosion and other water quality problems.

“There are already over several hundred thousand hectares invaded by Lippia weed in the north west of NSW and in south-east Queensland,” Guy said.

The Australian Cotton CRC and the Murray Darling Basin Lippia Working Group, funded by the Murray Darling Basin Commission, recently completed a major economic and environmental study of the impact of Lippia weed in the Basin.

As a result of this study, further research was commissioned by the Weeds CRC and Meat & Livestock Australia, and is supported by the Cotton CRC.

Local Government has since identified the need for additional research, and is lobbying several Federal and State agencies to jointly fund, progress and implement a continuing research strategy.

Guy said one of the research areas being investigated by the CRC, in conjunction with the Weeds CRC, is a PhD pro-

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Lippia is spreading rapidly in many of our cotton valleys.

Background on Lippia

The distribution of Lippia has increased significantly over the past 10–20 years. Its spread appears to be clearly related to flood events. In the Gwydir region, the Lippia population increased markedly following the 1996 flood and again after the 1998 floods. In the Lachlan, a significant increase in Lippia followed the floods of 1990. Under conditions of adequate soil moisture it would not be unexpected to achieve very close to 100 per cent cover by Lippia within three to four weeks following rainfall sufficient to saturate the soil profile and provide suitable growth conditions.

The presence and success of Lippia in establishing in the relatively lower rainfall areas of the lower Murrumbidgee, lower Murray and SA Murray Darling Basin would suggest it is only a matter of time before Lippia extends further west along the Barwon and Darling Rivers of NSW and the Warrego and Paroo system in Queensland. Its current sporadic occurrence in these areas would suggest it has the ability to adapt and persist in relatively drier environments. The ability of Lippia to tolerate drought, retain green leaf and grow rapidly, gives it an advantage over other species under favourable soil moisture conditions. These characteristics of Lippia have a detrimental effect on plant species diversity, with the result that all diversity is suppressed where it occurs at high density.

Distribution and impact of Lippia

- Lippia occurs in every State and is a severe and increasing problem throughout the Murray Darling Basin where it is estimated to be present over an area in excess of 5.3 million hectares.
- Lippia is present within each of the 19 catchments of the MDB to varying degrees.
- Lippia is creating the biggest problems in the Condamine, Border Rivers, Gwydir, Namoi and Lachlan catchments.
- Changes to the water regime in all catchments of the MDB have led to significant changes in the environment and constriction of wetland and floodplain area.
- Lippia is readily dispersed throughout river systems in floodwaters.
- The distribution and density of Lippia in all MDB catchments has increased with each flood recorded in the respective catchments over the past 15 years.
- Lippia has the ability to adapt to changing environmental conditions and is spreading through country not affected by floodwaters. It establishes readily on bare ground.
- Given a suitable sequence of climatic events and suitable soil surface conditions, Lippia has the potential to spread throughout the entire MDB floodplain area.
- The estimated cost of Lippia to the livestock industry is \$38 million per year.
- Lippia has significantly impacted and continues to threaten biodiversity in the MDB.
- The loss and displacement of native grassland communities by Lippia has resulted in severe erosion problems.
- The cost of Lippia in terms of the reduction in environmental services provided by floodplains and wetlands is estimated to be \$1,800 million per year.
- Lippia dispersal mechanisms and soil seed bank characteristics require further investigation.
- Current chemical options are ineffective in suppressing Lippia and there appears little possibility of additional chemical options becoming available in future.
- Cultivation is perceived as the cheapest and most effective form of suppressing Lippia, although the practice of cultivating floodplains carries a high risk of soil loss and reinvasion of Lippia during floods and cannot be considered sustainable.
- Planned grazing strategies utilising high stock density and allowing pastures adequate recovery from grazing offers an opportunity to re-establish groundcover and prevent Lippia invasion.
- Biological control should be developed as a matter of urgency as it appears to be the only management option that might provide control in much of the reserve, crown and council lands and riparian areas.
- Studies are urgently required to improve understanding of the reproduction and growth of Lippia in relation to its environment and identify management strategies.
- An urgent review of current management practices throughout the MDB is required to restore ecosystem health and productivity of agricultural land.

ject through the University of New England on the ecology of Lippia at four wetland and floodplain sites in the Gwydir and Namoi catchments.

UNE PhD student Matt McDonald who is conducting the research said: "The main focus of this research is on investigating the relative importance of seed versus vegetative reproduction on its spread. This includes study of germination conditions, breeding system and field experiments.

"In field experiments, a range of treatments will be performed to quantify such processes as growth and seed production, seedbank decline over time and the seasonality of recruitment events".

"By understanding these fundamental ecological aspects of the species, the effectiveness of management strategies and biocontrol can be increased," he concluded.

The project is being conducted by UNE PhD student, Matt Macdonald, supervised by John Duggin, Brian Sindel and Wal Whalley (UNE), and Mic Julien (CSIRO).

The lippia report is available at www.cotton.crc.org.au.

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PhD student Matt McDonald UNE (left), Dr John Duggin UNE and Dr Mic Julien CSIRO, have a daunting task ahead, to halt the spread of 5.3 million hectares of Lippia weed in the Murray Darling Basin.