

## Ecosystem Services:

# Knowledge of Nature Increases

Many cottongrowers have been improving environmental management on farm in recent years and in doing so have gained benefits for production

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The benefits people gain from the environment are referred to as 'ecosystem services' and it is becoming increasingly apparent just how much cotton producers and the wider community stand to gain from improving ecosystem service provision on farm. The Cotton Catchment Communities CRC (Cotton CRC) is helping to identify the benefits of environmental management and provides information to help growers to gain the most value from them. Cotton farms comprise a variety of different non-crop ecosystems including native vegetation areas, tree corridors, river frontage, natural wetlands and water storages.

One of the most important and widely recognised benefits from non-crop ecosystems on cotton farms is natural pest control as these areas provide habitat for beneficial organisms - generally termed 'beneficials'. At the 2010 Australian Cotton Conference, insect ecologist Dr Nancy Schellhorn from CSIRO Ecosystem Sciences, Brisbane, reported that research has shown beneficial insects are using native vegetation habitats, moving into crops and attacking pests early in the cotton season. Nancy said that having a diversity of habitats is important for agricultural ecosystem services as this allows flexibility throughout the year and in changing environments. Growers such as Andrew Watson from "Kilmarnock" near Boggabri in NSW (see feature story) are finding that with the availability of Bollgard II, beneficials are now playing an even greater role in Integrated Pest Management (IPM).

"As part of our IPM strategy we have looked at how far beneficials can travel, how far our tree corridors and native vegetation areas are from cotton and how this relates to spraying for insects. It is only in the last couple of years with us not spraying (insecticides) that we have been able to see the benefits from not spraying," Andrew says. Cotton Catchment Communities CRC Catchment Program Leader Jane

McFarlane says that there has been quite a lot of research into strategies to manage beneficial insects through native vegetation and "we want to extend those results and pass them on to growers, agronomists and CMAs". This is one of the drivers behind a new project to update the Guide to Pests and Beneficials in CottonLandscapes which has started this year. A number of researchers and extension staff will be involved with updating the guide which is being funded by the CRDC, Cotton CRC and commercial partners. This project is being co-ordinated by CSIRO's Sandra Deutscher.

"It is due for launch later this year, and we expect the guide will not only be a key resource for correct identification of cotton pests and beneficial species by crop agronomists and consultants, but will also provide a better appreciation of the contribution of native vegetation to IPM," Sandra says. "We hope it will ultimately contribute to improved awareness and management of native vegetation areas on cotton farms." In addition to natural pest control, there are a number of other important ecosystem services providers to cotton production. Stacey Vogel, Namoi CMA Catchment Officer and Catchment Sub-program Leader for the Cotton CRC says healthy soils are important to water, carbon and nutrient management, and determine how these are transformed and transported through the soil and in turn made available for cotton growth and yield. "Fertile soils can sequester carbon and activities in cotton cropping systems that sequester carbon include minimum tillage and residue mulching and incorporation," Stacey says. "Soils also determine infiltration, run-off, deep drainage and groundwater recharge." Valuing ecosystem services can be a difficult task due to the high level of variability in ecosystems on cotton properties and the enormous number of interactions that occur between them. However, the Cotton CRC now has a number of R&D projects that are increasing knowledge in the value of ecosystem services to help growers understand the benefits in managing natural and revegetated areas in cotton production. Jane McFarlane explains that the industry is shifting its focus of new ecology research and is looking at other ecosystem service provisions, in particular carbon sequestration.

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