

# Environmentally destructive ant species faces high-tech NICTA defence

With the support of the Queensland and Federal Governments, NICTA is developing a tool to quickly identify populations of dangerous and aggressive red imported fire ants. The NICTA Biosecurity Group, based at the NICTA Queensland Research Laboratory and Griffith University, aims to have a prototype identification system ready by July next year.

Fire ants are not only extremely destructive, but also tiny (2-6mm) and impossible to identify with the naked eye. Easily confused with common coastal brown ants and other native ants, their correct identification currently involves Biosecurity Queensland officers travelling to areas of suspected ant outbreaks to collect samples and bring them back to the lab to identify them under a microscope. This is time consuming and expensive.

Supported by \$100,000 from the Department of Agriculture Fisheries and Forestry (DAFF), and \$50,000 of in-kind support from Biosecurity Queensland, NICTA is harnessing computer vision and mobile communications technology to allow fire ants to be correctly identified in the field. In the proposed system, a field microscope will collect images on a laptop or PDA where NICTA-developed software will perform species identification. "We are developing automated pattern recognition technology to recognise and screen the ants in situ," said Yongsheng Gao, Leader of the NICTA Biosecurity Group and Associate Professor at Griffith University's School of Engineering. "We expect to reduce by at least half the number of samples having to come back to the lab," said Professor Gao.

Red imported fire ants can decimate ecosystems by destroying plant populations and competing with native herbivores and insects for food. They also deliver a painful and potentially dangerous bite. Under Queensland legislation, fire ants are a notifiable pest and suspected sightings must be reported to Biosecurity Queensland. Fire ants were first identified in Australia in 2001 in Brisbane, triggering a national eradication effort that has significantly reduced their numbers.

Director for the Biosecurity Queensland Control Centre (BQCC) Neil O'Brien said the NICTA project has the potential to allow field diagnosis at a very high level of detail. "Other ants may look very similar to fire ants at first glance. Fine anatomical details such as antennae and petioles can help distinguish them," said Mr O'Brien. "This work means that samples that are clearly not fire ants could immediately be excluded. We will only need to minutely examine highly suspect samples. This provides a speedier exclusionary diagnosis for regional reports and will save time in the lab."

NICTA Queensland Laboratory Director Terry Caelli welcomed the new funding. "NICTA is always looking for ways to address tough challenges like this with innovative Information and Communications Technology," said Professor Caelli. "With the support of the Queensland and Federal Governments, we plan to deliver real improvements to fire ant identification methods, speeding up the identification process and helping reduce the numbers of fire ants in South East Queensland."

## About NICTA

National ICT Australia Ltd (NICTA), Australia's Information and Communications Technology (ICT) Research Centre of Excellence, is developing technologies which will meet the current and future needs of the community in fields which will lead to large economic, social and environmental benefits for Australia. NICTA has five laboratories around the country. Since NICTA was founded in 2002, it has created four new companies, developed a substantial technology portfolio of patent applications and continues to supply new talent to the ICT industry through the NICTA-enhanced PhD program.

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