

Comment:

The Australian Nuclear Science and Technology Organisation (ANSTO) is one of Australia's largest public research organisations and home to Australia's nuclear expertise. Many of the most important questions society faces today can be addressed through nuclear techniques used at ANSTO. ANSTO's national landmark infrastructure includes the OPAL research reactor, and a suite of accelerators, including the Australian Synchrotron in Melbourne. These facilities are user based and allow researchers from universities, and a range of commercial users including grain producers, dairy industry, water companies and livestock organisations to conduct research which can directly affect their activities including yield, marketing and export markets.

ANSTO significantly contributes to research which has the potential to improve the effectiveness and efficiencies within the Agricultural sector. ANSTO develops new key technologies that support Australia's agricultural competitiveness, capable of producing a step change improvement in agricultural productivity.

Examples of ANSTO scientists using nuclear techniques which can only be done at ANSTO and the Australian Synchrotron include:

Pest management

ANSTO scientists have used magnetic resonance imaging (MRI) scans to show that irradiation to kill pests in mangoes does not degrade or damage the fruit. The study illustrates how ANSTO's expertise makes a crucial contribution to the development of Australia's national food security by providing new insight into the viability of irradiation to achieve safe phytosanitary (pest and disease) protocols for the agriculture industry, see more at <http://www.ansto.gov.au/AboutANSTO/News/ACS013091>.

Soil Scanner

ANSTO has developed an updated soil scanner using neutron activation analysis that can measure soil composition, moisture and bulk density 100 times faster than other scanners available. The current array of Precision Agriculture equipment suppliers and software solutions available to grain farmers is confusing due to uncertain claims of benefit from individual suppliers. Once commercial development is formalised, ANSTO's soil scanner would provide seamless solution to data collection, information processing and actionable economic farm-management decisions.

Wine tannins

The Department of Primary Industries is working with the Australian Synchrotron to determine the exact influence of tannins, on the taste and ageing qualities of wine. Tannins, seen below as coloured micrographs, have a large size variation and while its known that they affect ageing and taste, understanding exactly how, will provide globally competitive insights for the Australian industry.

AquaDiagnostics at the Australian Synchrotron AquaDiagnostic Pty Ltd. is a Melbourne company producing advanced water quality monitoring equipment and consumables for Chemical Oxygen Demand (COD) measurements. AquaDiagnostics has used the Australian Synchrotron to enhance the quality of its proprietary nanotechnology PeCOD® sensors through increased understanding of its manufacturing process. Through using the Synchrotron's accelerators this technology has improved the ability to detect the level of organic pollutants in water sources, an indicator of water quality. The international market for COD measurement is AU\$100+ million, and the improved product makes Australian companies more competitive internationally.