

# Protecting our crops—partners in food security

Australia and America are farming nations

The science underpinning modern farming has enabled our farmers to become more efficient, and more profitable. Take grain for example. American farmers grow over 440 million tonnes of grain each year. Australia produces about 40 million tonnes. Together that's about one-sixth of global grain production. Good science has contributed to a tripling in grain production over the past half century. Both nations export to the world. But whenever we store and transport grain the bugs bite. The latest collaborative research between our two nations is changing that.

## Protecting a golden harvest

Weevil and beetles love stored grain. Traditionally they're controlled by fumigation with phosphine. But the bugs are developing resistance to the gas. So researchers from Kansas State University and Australia's Plant Biosecurity Cooperative Research Centre have joined forces with agricultural businesses in both countries to tackle the problem. They've investigated the ecology of two of the most important pests and shown farmers how they can stop the bugs from spreading. They've modelled how to get the right dose of phosphine in a grain silo to kill all the bugs without the costs of over-fumigation, and they've looked at alternative gases.



Now they're searching for non-chemical options for pest control. Some of the possibilities include use of nitrogen and low oxygen levels. But the most exciting prospect is the use of food-grade forms of inert powders such as silica. One key has been the development of ways to apply the silica so it works in different kinds of grain and in storage and transport.

The team are now working with industry partners to bring these technologies to market.

## Drones and disease

Kansas State University are also leaders in the use of drones in agriculture. With their Australian Plant Biosecurity colleagues they're now using drones to track crop diseases. Not only can the drones rapidly survey broadacre farms, they can do so without running the risk of spreading crop diseases. The very act of sending staff and vehicles into an affected farm runs the risk of spreading fungal crop diseases. Drones can operate without any risk of spreading disease in the process.

Drones can rapidly check crops and reduce the risk of disease spread



Texan cotton farmers have boosted production and cut chemical use



## Also...

Over 60 per cent of Texan cotton is grown using CSIRO varieties that boost yields and reduce the need for chemicals to control insect pests.

Iowa-based company DuPont Pioneer and Melbourne-based Hexima have discovered a novel insect control gene that is active against certain crop-destroying insects and will help growers protect their yields. Insects reduce US crop productivity by over \$5 billion a year.

The US Agency for International Development (USAID) is supporting a US/India/Australia private/public partnership to develop grain plants that can withstand environmental stresses such as drought, flood, and salinity. The research is part of the US government's global hunger and food security initiative, Feed the Future.

An Australian native grass—Nara—is spreading through American backyards as a low maintenance, salt-tolerant turf. In Australia it naturally grows from the southern tip of Tasmania up to the northern tropics.

North Carolina State University is working with a new Australian Research Council hub in Legumes for Sustainable Agriculture to improve the productivity of peas, beans and other grain legumes. The US is the world's largest grower of soybeans. Australia is the largest grower of lupins.

Read about these, and other Australia-US partnerships in mining, cyber security, advanced manufacturing, energy and more at [www.usa.embassy.gov.au](http://www.usa.embassy.gov.au)



Australian Government

US and Australian researchers are finding new, chemical-free ways to protect grain from insect attack.

