nature

www.nature.com/nature

Vol 452 | Issue no. 7184 | 13 March 2008

Growing pains

The fight against agricultural diseases in the United States has been boosted by fresh funds and a national monitoring network. But these advances are being undermined by inflexible bureaucracy.

The US government's restrictions on research into 'select agents' — organisms that could potentially be used as bioweapons — have rarely been popular among scientists, largely because of the monitoring and bureaucracy involved. But after the terrorist attacks of 11 September 2001 and the anthrax mailings that followed, researchers have accepted the restrictions as a fact of life. And the consequences have sometimes proved to be positive for science.

This is especially true for research into agriculturally important plant diseases; pathogens that were first included on the select-agent list in 2002. The concern was that 'agroterrorists' might use these diseases to devastate crops across whole regions or countries. The result has been a much-needed boost in funding for the field — especially for detecting outbreaks of plant disease, whether the origins are natural, accidental or intentional. Before 2002, each state ran its own plant-pathology lab, creating a patchwork monitoring infrastructure with disparate practices and little communication. Now the US Department of Agriculture (USDA) operates an integrated network of plant-disease labs that spans the nation.

Nevertheless, the regulations can be inflexible. Take the case of huanglongbing, or citrus greening (see page 148), a disease from Asia that was first seen in the United States in 2005 near Miami, Florida, and has now spread to nearly half of the state's 67 counties. Scientists there can find the bacterium that causes huanglongbing right outside their windows. But because it is listed as a select agent, they cannot study infected plants in their labs for more than a week without violating the law. So in this instance the listing has become not only irrelevant, but downright harmful because it prevents or delays research that might stop the scourge.

To its credit, the law on select agents allows for situations such as this to be remedied through a biennial re-evaluation of the list. The USDA is undertaking such a review at the moment, and may remove one species of huanglongbing bacterium from the list this year. But the process is far too slow — not least because the USDA casts such a wide net in soliciting feedback for its re-evaluations. When pathogens can explode out of nowhere within months or even weeks, such well-intentioned mechanisms can do more harm than good.

"When pathogens can explode out of nowhere within months, the slow review process can do more harm than good."

To prevent this from happening again, the USDA needs to streamline its re-evaluation process to allow it quickly to de-list a plant disease once it becomes widespread in US soil. Waiting for an arbitrary deadline or excessive amounts of outside input before making such decisions undoes what good the select-agent rule has done.

Last October, the House Committee on Energy and Commerce held a hearing in which some members called for greater oversight of biosecurity research. The focus was the proliferation of laboratories studying human and animal pathogens that could be used as agents of terror. But Congress should also reconsider what oversight and coordination can do to protect people and plants. And it should pay heed to the Catch-22 of regulating research that needs to be nimble and creative to effect such protection. ■

Markets can save forests

With the right infrastructure, the forces threatening to destroy the world's trees could be their salvation.

Trees are worth more dead than alive on the international market — a stark economic fact that has undermined countless programmes to protect rainforests over the years. It is a lesson that should not be forgotten as the international community explores ways to reduce global-warming emissions from deforestation. Conventional programmes involving incentives, laws and enforcement may prove useful, or even necessary — as highlighted by Brazil's approach to the issue (see page 134) — but to solve the problem completely, the international community will need to design a better market that recognizes the value of standing trees, forests and the less tangible services they provide. Integrating deforestation into international carbon markets, the most notable of which is the European emission-trading scheme, is a good place to start.

In this context, the European Commission's recent proposal to bar deforestation credits from the next phase of trading is a disappointment. The commission's fear is that cheap deforestation credits will suddenly soak up all of the money for reducing emissions (see *Nature* **452,** 8–9; 2008). If ending deforestation quickly is indeed the cheapest way of reducing emissions, it is not clear why this should be a problem. But in truth, a great deal has to be accomplished before any market scheme will be viable.

In recent years, for example, scientists have greatly improved their models for estimating the most critical number for deforestation: the amount of carbon released into the atmosphere when a given plot of land is razed. This information can now be extracted fairly accurately from satellite images. But to do that consistently, on a global scale, rainforest nations will need to train people and develop a standing infrastructure for monitoring. This will not be cheap — and is another area in which conventional government-run programmes might be needed. The scientific community can play a direct role as well, by helping to get these programmes up and running.

Access to information will be critical. A few satellites can cover the