



Rodents

Research for Combating a Global
Threat to People's Livelihoods.



A global problem

Rodents are the most successful mammals, second only to humans, and some species can cause serious agricultural and health problems for people. Scientists at the Natural Resources Institute (NRI) have led several research and development projects in collaboration with researchers and communities in many countries across Africa and Asia. These projects share the objective of generating knowledge about rodents in order to improve the way we manage them.

The impact of rodents

Rats are truly a global problem, affecting all farming systems. Each year rats do untold damage to crop production, damaging nearly any crop they come into contact with, including the major staples of rice, wheat and maize as well as most fruit and vegetable crops. It has been estimated that an additional 180 million people could be fed each year by reducing rodent damage in rice fields in Asia by 5%. This comes at a time when countries such as Vietnam and Indonesia routinely report rodent damage to rice of 30% and 17% respectively.



PhD student Nikhil Chakma being trained in rat dissection in order to collect breeding and taxonomic information

Reducing crop damage by rodents not only improves food security and nutrition but can lead to increased income. Reducing post-harvest loss and food contamination by rats improves health and nutrition as well as lowering disease transmission.

People living in rural and urban communities in developing countries can be bitten by rats while sleeping, leading to gangrenous infections and sometimes permanent disfigurement. In keeping with many people's worst nightmares, rodents are vectors and reservoirs for more than 60 diseases – including leptospirosis, typhus, viral haemorrhagic fevers and bubonic plague. Some of these diseases appear to be increasing in frequency, particularly in Africa, and NRI scientists are involved in research to understand what is causing these disease outbreaks.

Ecologically-based rodent management

Ecologically-based rodent management (EBRM) is a new paradigm of scientific study which aims to control rats and the damage they cause in more sustainable ways than the traditional use of rat poisons. NRI has been leading the way in developing sustainable and cost-beneficial rodent management in countries such as Bangladesh, Tanzania, Namibia and Swaziland. Community involvement in the local development of EBRM leads to long-term solutions for reducing the impact of rodents on livelihoods.

Population outbreaks of rats can lead to localised swarms, triggering regional famines when crops are completely destroyed. Climate change, increased cropping intensity and natural disasters such as cyclones appear to be contributing to more frequent and severe outbreaks of rodents around the world. NRI has been at the forefront of



Training women on how to use rat traps enables them to take charge of rat management in their communities

ecological research to understand these phenomena in order to build effective interventions.

Rats and human health

The symptoms of many rodent-transmitted diseases are not obvious and often not clinically suspected as they are confused with more common diseases such as malaria. In the NRI-led RatZooMan project, a multidisciplinary team of scientists (veterinarians, clinicians, agriculturalists, anthropologists, epidemiologists, economists and ecologists) came together in order to investigate zoonotic diseases carried by rats and develop ways of reducing transmission risks. Local scientific capacities were strengthened and project outputs were adopted by local government authorities.

Training and capacity building

The NRI-led EcoRat project brings together scientists to look at the rodent problems affecting farmers in southern Africa. Through EcoRat, NRI staff continue to work towards strengthening the capacity of agricultural

scientists to deliver research and technology that meets the needs of small-scale rural farmers. This improves the knowledge and tools made available to communities facing the multiple impacts of rats on their lives.

Selected publications

Belmain, S. R., et al. (2010) 'Developing pesticide-free rodent control for southern Africa'. *Pesticides News*, **87**: 9–11.

Belmain, S. R. (2009) 'Rat Race'. *Developments*, **45**: 33–35.

Belmain, S. R., et al. (2008) 'The ECORAT project: Developing ecologically-based rodent management for the southern African region'. *International Pest Control*, **50**(3): 136–138.

Belmain, S. R. (2007) 'Rats: An ecologically-based approach for managing a global problem'. *Low External Input and Sustainable Agriculture*, **23**(4): 18–20.

Project information can be found at www.nri.org/ecorat, www.nri.org/ratzooman and www.nri.org/bandicoot.



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