

THE SCION RURAL FIRE RESEARCH GROUP IS SUPPORTED THROUGH FUNDING FROM THE FOUNDATION FOR RESEARCH, SCIENCE AND TECHNOLOGY (FRST). SUPPORT ALSO COMES FROM THE NEW ZEALAND RURAL FIRE SECTOR, COMPRISING THE NATIONAL RURAL FIRE AUTHORITY, NEW ZEALAND FIRE SERVICE COMMISSION, NEW ZEALAND FOREST OWNERS' ASSOCIATION, DEPARTMENT OF CONSERVATION, NEW ZEALAND DEFENCE FORCE, MEMBERS OF LOCAL GOVERNMENT NEW ZEALAND, AND FEDERATED FARMERS OF NEW ZEALAND.

## Rural Fire Research

Developing the science and technology needed to protect life and property, and manage fire in the landscape

### About Scion

Scion is a Crown Research Institute dedicated to building a stronger bio-based economy for New Zealand. Research into fire behaviour, fuel types and public safety is critical to helping protect the natural resources on which this bio-economy is based.

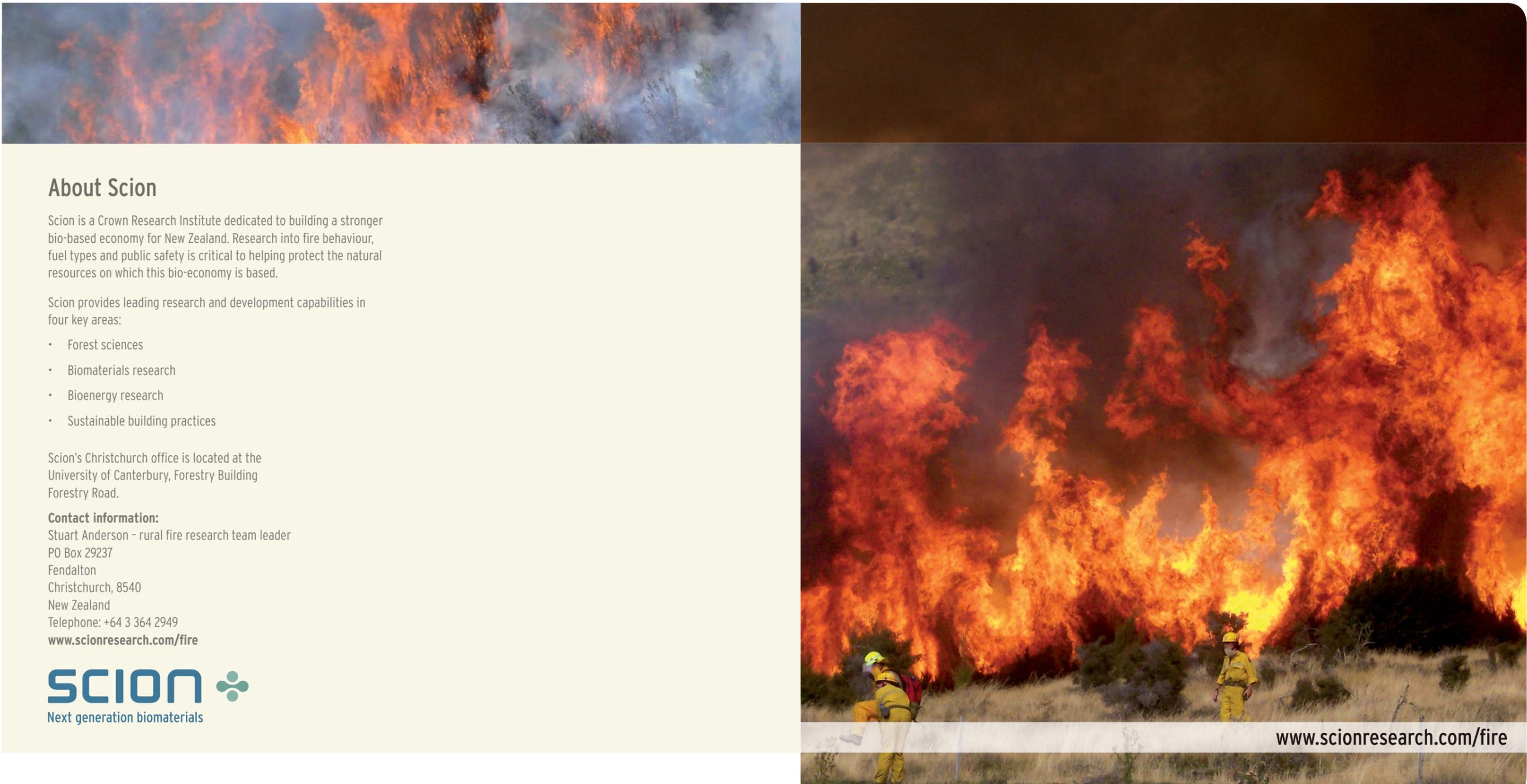
Scion provides leading research and development capabilities in four key areas:

- Forest sciences
- Biomaterials research
- Bioenergy research
- Sustainable building practices

Scion's Christchurch office is located at the University of Canterbury, Forestry Building Forestry Road.

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## Supporting rural fire management

An understanding of how fires are likely to behave in different weather conditions, terrain and fuel types is essential to fire management. For more than 15 years, Scion has applied its specialist knowledge to the development of tools and guidelines that assist fire managers in making effective decisions regarding firefighter and community safety.

Scion's research programme is aimed at increasing knowledge of fuels and fire behaviour, with a strong focus on the development and improvement of the New Zealand Fire Danger Rating System. Its scope covers rural land and the rural/urban interface

Other research areas cover the social aspects of fire management, such as community recovery, communication mechanisms, and research into improving firefighter productivity.

## Scion expertise

The specific objectives of Scion's research programme are to provide land and fire management agencies with greater capacity to:

- Enhance firefighter safety.
- Better understand fire behaviour.
- Enhance community safety and protection.
- Allow for the safe and effective use of fire as a land management tool.
- Deploy effective suppression resources.
- Manage fire in different vegetation types.



## Rural fire research

**Forests, rural landscapes and local communities are increasingly at risk from wildfires. The fire agencies responsible for managing these risks require specialist knowledge of fire behaviour, fuel types and public safety factors.**

The rural fire research group at Crown Research Institute Scion is New Zealand's only provider of the science, research and practical experience needed to support the protection of New Zealand's natural environment from fire.

Scion works in close collaboration with bushfire researchers at CSIRO in Australia and is a partner in the Australian Bushfire Cooperative Research Centre (CRC). This collaboration provides leading expertise across all disciplines relating to fire science and modelling.



## RESEARCH APPLICATIONS



## Fuel moisture modelling

Scion is improving models that represent the fuel moisture dynamics in scrub fuels. Experiments have been conducted in gorse scrub to investigate fuel moisture and its effect on ignition and fire spread thresholds. This research has highlighted the extent to which fire development is driven by the elevated dead fuel layer. Outcomes from the research will be extended to native scrub fuels and incorporated into the Scrubland Fire Danger Rating model.

## Safe and productive firefighting

Knowing exactly how firefighters work and the hazards they face enables the development of safer and more efficient work practices. Scion has developed a wearable system that includes video cameras, GPS tracking and a heart rate monitor which enables scientists to know where someone is, what they are doing and how the task is affecting their heart rate. By linking this information for the first time, researchers can form a detailed picture of an individual's workload, and their physical response to it.

## Community recovery

As urban populations expand into rural and forested areas, wildfires affect a growing number of people. Scion conducts social research to develop best practice guidelines that will lessen the impact of fires on communities. One research project focused on the 2003 West Melton fire, an area on the outskirts of Christchurch which caused major damage to homes and properties. This study provided valuable insights for helping others prepare for and recover from future fires.

## Grassland Curing

Scion researchers are identifying better techniques for assessing seasonal dieback of grassland and subsequent fire risk. The degree of curing (i.e. percentage of dead grass in a grassland) is an important input into fire danger rating systems. Accurate assessment will help to protect life and property from grassfires, and enable the effective use of fire for land management purposes. This Bushfire CRC project is underpinned by an extensive field data collection programme being undertaken across New Zealand and Australia.

## Weather and climate research

Scion specialises in understanding the climatic factors affecting wildfire risk as a means of providing better information to fire managers. Scion researchers have developed a database of daily fire weather and fire danger records for a network of weather stations located across New Zealand. This has been used as the basis for analyses aimed at improving the description of New Zealand's fire climate and associated fire risk. Research into the potential effect of climate change on future fire risk in New Zealand has shown that fire danger is likely to rise significantly in most areas, particularly the east.

