



1000 projects and counting

Celebrating the success of the
Sustainable Farming Fund
2000–2017



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Ministry for Primary Industries
Manatū Ahu Matua



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A herd of black cattle is grazing in a field of dry, yellowish grass. In the background, there is a large body of water and a range of mountains with snow-capped peaks under a blue sky with some clouds. A portion of a tractor is visible on the left side of the image.

**Sustainable
Farming Fund**



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Foreword

Minister Nathan Guy

It is a privilege for me to announce the 1000th Sustainable Farming Fund project at this year's National Agricultural Fielddays, and launch this booklet that captures the stories of just a few of the first 1000 projects.

Over the last 17 years so many within the primary industries have benefited from the fund's unique collaboration of farmers and growers, scientists and researchers, iwi, local government and many others, all working together at a grass-roots level.

These 1000 projects have provided a significant contribution not only to the development of New Zealand's primary industries, but to our economy, rural communities and to the sustainability of our environment.

No industry can be sustainable if the current and future environment is not taken care of. As research and innovation develops, we are gaining more and more knowledge on how



to sustain our land for future generations and how to protect our most precious natural resources. Many SFF projects have had a role to play in shedding light on how we can optimise the use of our resources while also protecting our environment.

I encourage you to read the stories of success captured in this booklet. All of these projects prove the power of a good idea combined with community collaboration.

Thank you to all of you who have contributed to each one of Sustainable Farming Fund's now more than 1000 projects over the last 17 years. Please continue to inspire, innovate, and collaborate.

I hope you will enjoy reading these stories as much as I have.

Hon Nathan Guy
Minister for Primary Industries

1000 grassroots projects and counting

The Sustainable Farming Fund (SFF) was established in 2000, by the Ministry of Agriculture and Forestry (a predecessor of the Ministry for Primary Industries), to fund projects that contribute to the economic, environmental, and social wellbeing of New Zealand’s land-based primary industries. Aquaculture was later added following the merger with Ministry of Fisheries. Seventeen years later, \$150 million has been committed by MPI to over 1000 projects.

Compelling stories

This booklet reflects on 33 successful SFF projects, covering each year of the fund, from 2000 through to today. The projects showcased each tell a compelling story of a challenge

overcome through the power of collaboration, applied research, and effective action. There are insights into the SFF’s ability to transform lives, and contribute to the social fabric of our rural communities and industries.

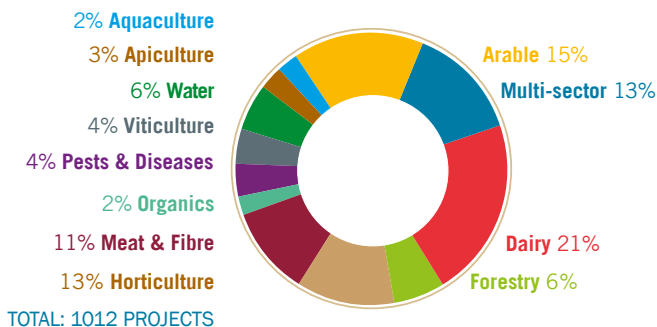
The graphic on the left below shows the breakdown of the 1012 projects to date by the main sector, or area, they are focused on.

Sustainable Farming Fund projects, however, are built on a backbone of collaboration so many of the projects benefit a range of sectors, with those classified as “multi-sector” being equally beneficial to more than one sector. The largest number of projects have been dairy projects, but many multi-sector projects involve several industries collaborating together.

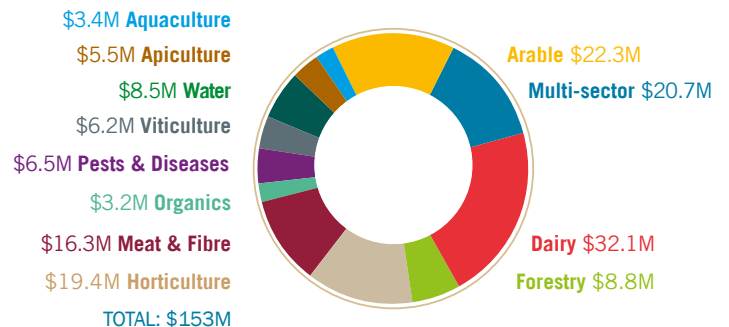
Each project tells a compelling story of a challenge overcome through the power of collaboration, applied research, and effective action.

The graphic on the right shows just how the MPI funding has been split between the sectors/areas that have been funded. You will notice that the funding nearly mirrors the number of projects funded in that area. This is because there is not a huge variation in the size and expense of projects funding-wise between sectors. The largest sector funding-wise is dairy, with the smallest being aquaculture and organics.

Sustainable Farming Fund projects by primary sector focus



Sustainable Farming Fund projects by NZ dollar contributions



Common success factors

All of the projects featured in this booklet have commonalities, despite addressing a diverse range of problems and opportunities. These same aspects have carried through from the earliest SFF projects to the projects getting underway in July 2017. These can be summarised as:

- Driven by a wide “Community of Interest”, which is farmer, grower, or forester-led.
- Making a strong contribution to the sustainability of New Zealand’s primary industries.
- Undertaking a programme of applied research and development and carries out a well-crafted and tailored extension and knowledge sharing plan.

- Creating information or intellectual property that is available to all and for which the benefit goes beyond an individual or single business, to the industry or industries as a whole.

The 1000th Project

The 1000th project funded by Sustainable Farming Fund, “Ka Matau ka Ora (People and Capability) – An ecosystem for workforce and governance development for Māori kiwifruit orchardists” begins in July 2017 and is being headed by Tūhono Whenua Horticulture Ltd. Working alongside them are Fruition Horticulture, PlusGroup, and Te Awanui Hukapak. Zespri and Bay of Plenty Regional Council are also providing support.

The Ka Matau Ka Ora project is described as “living through healthy people” shortened to “people and capability”, and aims to provide a tailored system of learning, knowledge transfer, and transformation for Māori kiwifruit orchardists. By the end of the project, an orchard training/ cadetship course with Tūhono Whenua Horticulture, Te Awanui Hukapak Ltd, Zespri and Primary ITO will be developed that will be accepted and recognised by the industry. This upskilling of Māori kiwifruit workers through this course will improve management and governance capability, and on-orchard performance.

This project, Sustainable Farming Fund’s 1000th, epitomises the strengths and characteristics of the fund which have remained unchanged over 17 years. Grassroots growers, identifying a problem or opportunity, growing a community of interest, then making the project happen.

MPI is looking forward to supporting many more projects that follow this well-proven method. The proof lies in the stories you currently hold in your hands, and in the thriving primary industries supporting New Zealand.



The 1000th Project. Photo: Jamie Troughton/Dscribe Media.

Sowing the seeds **2000–2004**



2000

Developing best practice for avocado growing

In 2000, an emerging avocado industry continued to struggle with low and irregular bearing of fruit between seasons, causing regular and expensive disruption to domestic and export supplies.

Representative teams of growers in three regions decided to tackle the problem by sharing orchard knowledge and examples of success. The resulting collaboration, with SFF support, helped generate an industry best-management practice “bible” – and also proved a catalyst for their industry.

Work began with four regional discussion groups, spanning the Far and Mid North to the Bay of Plenty, each involving up to fifteen growers supported by a consultant and facilitator. Meetings took place monthly, with a focus on production issues such as lifting fruit size, increasing yield and raising packout percentage.

“Participants at those groups responded positively to that peer environment, the grower-to-grower approach. They felt uninhibited and able to raise questions they’d have been reluctant to ask in the presence of a group of scientists,” recalls Henry Pak, a researcher with the NZ Avocado Growers Association at the time.

The project helped highlight the need to foster knowledge sharing across the industry, laying the foundations of a network of innovation leaders, rural professionals and growers ready to share and adopt best practice, driven by examples of success. A few participants would go on to assume key leadership roles in the industry, helping make it more professional, streamlined and collaborative.

As the project continued, it became obvious that growers needed to modify their practices according

to what they were seeing in the orchard. Participants in a follow-on project, armed with digital cameras, fed detail on individual orchard performance, a lengthy and iterative process culminating in *Reading Your Trees: A New Zealand Avocado Growers Guide*. This industry workbook encapsulated the best practice developed in the initial project, and introduced growers to the concept of “reading their trees” and how this could be used to proactively manage their orchards.

“The guide has raised awareness among growers of the need to manage trees at the appropriate growth stage in a proactive rather than reactive manner. It is a fantastic tool that continues to be widely used,” said Henry.

The project helped highlight the need to foster knowledge sharing across the industry, laying the foundations of a network of innovation leaders, rural professionals and growers ready to share and adopt best practice.

2000

Hawke's Bay focus orchard project

In response to stringent consumer demands, the pipfruit industry, like other export sectors, now fully embraces environmental sustainability. But the process of disseminating knowledge to growers about key issues like irrigation, spray application and drift, soil health, pests and diseases has taken time.

In 2000, a Focus Orchard project to encourage the adoption of sustainable fruit production practices in the Hawke's Bay growing region attracted SFF investment.

The overall aim was to improve grower profitability in the short and long-term, via technology transfer.

Key areas of activity included identifying best practice soil health and water management and minimising off-target spray drift and improving efficiency of pesticide application, central elements of so-called Integrated Fruit Production.

The project drew on the technical expertise of HortResearch, Crop and Food Research (both since merged into Plant & Food Research), local consultants, and leading growers.

Three focus orchards were selected

“Looking back, this important project proved a watershed in helping achieve our industry's wider objective of improving sustainable fruit production. Surveys we have undertaken suggest that the project delivered quantifiable results in terms of technology uptake.”

– TIM HERMAN

as sites where best practice could be demonstrated: an organic apple orchard, a conventional apple and kiwifruit orchard, and a conventional apple and summerfruit orchard, recalled project participant Tim Herman (now Technical Manager – Crop Protection, Pipfruit NZ).

“By using three orchards the advantages and disadvantages of different management systems could be compared. It also reduced the work required from the orchardists and their families. Including an organic orchard in the project recognised the growing trend towards organic systems and the large level of interest in them.”

Communicating information to fruit growers about the benefits flowing from the modified production practices was achieved through field days, a stream of media releases and articles, a dedicated website and other channels. “By harnessing these tools and using them to talk to a large captive audience, the opportunities to improve our industry through this project were immense,” said Tim.



2001

Miss McRae's dream: Sustainable hill country farming

Set high among the steep Wairoa hills, the McRae Trust farm is renowned as a place where sustainable land management practices are actively pursued. When Miss May McRae bequeathed her farm to the nation in 1975, the deed included a requirement “to demonstrate for the purposes of the betterment of farming on East Coast type hill country.”

In 2001, an SFF project based on the property took Miss McRae's dream to the next level. Over three years, farmers from around the district flocked to a range of field days successfully linking profit and conservation on steeper hill country farmland. Erosion control planting,

riparian management, forestry and native flora were among the issues thoroughly explored.

A leading edge of this activity was helping farmers gain a more informed understanding of the range of soils up there on the hilly McRae block – knowledge they could then readily transfer to their own properties.

Local understanding of soil capabilities was fairly patchy at the start. Trust chairman Peter Manson recalled how a few farmers turned up to the field days with soil maps; most were less knowledgeable but still keen to get stuck in.

“We were able to employ the skills of specialists such as Tony Rhodes from

AgFirst and the late Murray Jessen, a soil scientist from Landcare Research. Murray's course, based on a detailed soil analysis of the block and held at the Woolshed, was highly successful and very effective.”

Activity of this kind, mixed in with vigorous debate and field walks, helped local farmers understand the need for better tools to make informed decisions based on the knowledge of soils and their values.

Importantly, it led to the formation of a “Growing Business from the Ground Up” soils group with members doing a working analysis of their own farms, Peter recalled.

“This has been the major success of the whole project with many farmers now having skills that are crucial for the future of their individual businesses.” – PETER MANSON



2001

Controlling crop contamination

The potential for contamination through cross-pollination from conflicting crops had long been a thorny issue for the vegetable seed crop industry. Member companies used a manual process based on sticking pins on a paper map once a year.

In 2005, a digital tool developed by the Foundation for Arable Research (FAR) with SFF funding provided a revolutionary solution – and helped secure the position of the \$85 million export seed industry at the same time.

The key output of the “management of specialist seed crop isolation” was an innovative web-based system known as a Seed Crop Isolation Distance (SCID).

FAR Chief Executive Officer Nick Pyke recalled that while the system was ambitious at the time of its 2005 launch, the industry almost immediately grasped what it was offering and accepted it.

The process remains simple. Seed companies wanting to book a paddock, log on to the SCID website and input crop sites. The system performs an automated isolation check and returns a conflict notice if or when other cross-pollinating crops are entered onto the system and fall within that crop’s entered isolation distance.

An automated email notification is then sent to the seed company of the conflicting crops to alert them of the conflict and allow them to discuss a resolution. An automated paddock history check also occurs.

Scheme membership is currently voluntary, with no mandatory or legislative requirements for operators to enter crop sites.

However, for the scheme to operate effectively, all operators who are producing vegetable or forage brassica seed crops and/or oilseed crops are strongly encouraged to use the system.

Nick remains proud of the SCID system and its significant, enduring, barely acknowledged contribution to the seed crop industry. Other countries have elements of the system, but SCID is the most advanced and extensive one.



Hybrid radish plants flowering, male and female.

2002

Ridding the West Coast of ragwort

Like many of our pastoral weeds, ragwort came ashore by accident. It proved an early scourge on the landscape, poisonous to cattle, horses and deer, and a ruthless displacer of desirable plant species.

Attempts to control ragwort with biological control finally succeeded by the 1990s after the introduction of the ragwort flea beetle. But in wetter regions, like the West Coast of the South island, the weed remained a stubborn problem.

In 2001, the West Coast Ragwort Control Trust (WCRCT) joined forces with Landcare Research to obtain SFF funding to tackle the problem and explore the use of other biological agents in wetter regions.

“We soon learned that conditions on the West Coast were ideal for the ragwort but not for the flea beetle. WCRCT later gained approval to import and release two new agents, the plume moth and the stem-boring moth,” recalls Landcare Research scientist Hugh Gourlay.

The latter failed to establish but the plume moth flourished and was widely released around much of New Zealand. Further SFF funding allowed Landcare Research to train Caryl Coates from Barrytown to rear and release the plume moth.

Until recently Caryl monitored release sites, followed up with farmers, ran workshops and field days while rearing and releasing the moths.

All the hard work paid off. Hugh Gourlay said that during a visit to the West Coast in 2015, he struggled to find any significant ragwort infestations.

“What we now see is that ragwort has almost completely disappeared from many regions in New Zealand due to the flea beetle and the plume moth. The only areas where ragwort continues to persist in significant populations is on land that is still being sprayed with herbicides.”

He’s also delighted with the economic benefits that have flowed from the project.



“If biocontrol had not been instigated, expenditure on ragwort control across New Zealand dairy farms in 2015 would have been an estimated NZ\$64 million (adjusted for inflation and national herd size).”

– HUGH GOURLAY

2002

No8 Wired: SFF on TV

N*o8 Wired* was the little show that could, an award-winning TV programme committed to showcasing the evolving world of agribusiness. Partly funded by SFF, it ran for 136 successful episodes, proof of strong heartland support for rural and farming stories.

Its beginnings were modest. Gibson Group senior producer Brett Tompkins recalls the show grew out of a series of informative videos distributed to 25,000 farmers twice yearly.

“The massive job of duplicating and mailing those videos made us think ‘Why not put this on TV instead?’ So we went out and bought a half hour slot on TV3.”

The years after 2000 proved frantic as *No8 Wired*, fronted by former *Radio NZ* Rural Report head Don Carson, chased stories from the Deep South to the Far North.

The show kept a strong focus on a farming audience. Carson’s *Straight Talk* slot featured agriculture and rural decision-makers tackling the rural sector’s hard issues.

No8 Wired also addressed the nitty-gritty practicalities of the business of farming and the latest market outlook, featuring leading commentators from each of the major agribusiness sectors.

The all-important issue of weather was also highlighted, as experts like National Institute of Water and Atmosphere agriculture meteorology specialist Alan Porteous gave viewers the lowdown on soil moisture and pasture growth outlooks.

“*No8 Wired* covered the country, from the latest breaking agribusiness and rural news, to farming weather and current affairs.”

– BRETT TOMPKINS

Brett believes the show played a big role in helping make the public aware of the skills and technology underpinning modern agriculture, especially in the realm of sustainability.

By 2004, *No8 Wired*’s success, however, became its downfall as a rival show won funding from rival TVNZ.

The show was wound up, having only completed four successful seasons. Along the way, however, it had scooped up a number of awards, including the BNZ Rongo Award for Excellence in Agricultural Journalism in 2002.



No8 Wired team: L–R: Janet Tyson, researcher; Rachel Donald, presenter/reporter; Don Carson, presenter/reporter; Brett Tompkins, producer; Emma Robinson, reporter; Francesca Carney, project manager.

2002

Practical, safe, and effective strategies for citrus

The New Zealand citrus industry – like others in the fruit sector – faces constant pressure to improve the effectiveness and sustainability of its pest and diseases management. Worldwide consumers increasingly insist on practices as safe as possible to human health and the environment.

In 2002, NZ Citrus Growers Inc was granted SFF funding for a project to help capture safe, practical and effective pest management strategies as followed by many of New Zealand's larger horticultural industries.

"At the time (2002) the major driver was the fact that some of our most valuable insecticides and fungicides were at risk of cancellation because of new EuroGAP policies on food safety. Entry to the American market also ruled out some of the sprays used back then," said Rebecca Fisher, Executive Manager of NZ Citrus Growers Inc. (NZCGI).

A project steering committee was formed, comprising members of the NZCGI executive and prominent technical advisors in the industry. Most of the research, data management and benchmarking work was contracted out to HortResearch (now Plant & Food Research).

"Growers from all over the country supported the project, providing more than 500 spray diaries from 90 different orchard blocks. Along the way we learned much about reducing calendar spraying, use of disruptive chemicals and the establishment of pest monitoring protocols and pest thresholds. New pesticides were identified for registration," said Rebecca.

A key outcome of the three-year project was an integrated pest management manual and field guide for citrus growers, a valued industry resource that continues to be widely distributed and sold today.

"Given the age of the publication, NZCGI is undertaking a project to update the manual, using much of the existing data that is still relevant, but delivering the information as an online resource," she said.

Citrus grower Keith Pyle added: "The project manual and IPM poster gave a clear outline and description of the different pests and diseases, their phenology, susceptibility of the different varieties at different times of the year and an easy to follow management guide, with available control options."



2003

The future of flax

Harakeke/flax is among our most distinctive and beloved native plants. For a century a significant flax industry operated here. But in most parts of lowland New Zealand, this ancient species has quietly faded.

In 2003, the SFF supported a project to explore reconnecting flax to larger-scale environmental management in farmscapes and landscapes, for use in iwi land development, and for a revival of commercial crops based on flax.

“Harakeke is a little champion: robust, fast-growing, wind-tolerant, flood-tolerant, drought-tolerant, light-tolerant, frost-tolerant... all the attributes required of plants to take a lead in establishing a new indigenous/exotic farming matrix in lowland New Zealand,” said project manager Elizabeth McGruddy.

The project began by drawing on flax’s long and established history of traditional and industrial agronomy, a potential springboard for future developments.

“Our focus was on pulling together information from industry veterans, from the nurseries and regional councils involved with large-scale revegetation projects. We also tapped the scientists researching flax properties and contemporary product/market opportunities.

“Our intent was that – with the base information assembled in one place – flax enthusiasts could build forward from that platform.”

Although Elizabeth is happy with what the project achieved over three busy years, she describes flax as an industry in waiting.

“Landowners hesitate to jump in without knowing the market is there. The markets won’t develop without knowing the supply lines are there. The bit in the middle is the R&D, but the challenge for flax is that there is no existing industry sector to sponsor or part-fund it.”

“On the conservation front, hundreds of thousands of flax plants have since gone in the ground as part of riparian and farm plantings. On the commercial front, the stand-out is harakeke seed oil. This success builds on research at Lincoln initiated as part of this project.” – ELIZABETH MCGRUDDY



“The elements are there but a new generation needs to pick up the baton, building forward from the platform we established.”



Early establishment.

2004

A world beyond pine

Farm foresters looking beyond pine plantations have a range of options – but access to practical information about alternative timber species has traditionally been patchy.

In 2004, action groups within the NZ Farm Forestry Association (NZFFA), backed by the SFF, embarked on a three-year project to draw together knowledge about less orthodox species: cypresses, eucalypts, blackwood and redwoods.

Expert foresters, regional council staff, research specialists and land managers formed themselves into a series of individual species co-operatives, recalls project leader Denis Hocking.

“The first year focus was on cypresses, the second eucalypts, and the third year on new information on redwoods and blackwood.”

The eventual outcome was a suite of practical electronic handbooks, each comprising twelve chapters and running to approximately 100 pages, including widespread use of colour photography. They are seen as a highly valuable source and remain in use to this day.

Based on a web-based format with modules/chapters on each species, the project harnessed internet technology, still relatively new at the time.

Advantages included accessibility, searchability, updateability and ease of conversion to hard-copy format.


Denis said that the project provided an opportunity for many NZFF members to share decades of “best practice” knowledge and experience about alternative species.

“NZFFA receives frequent requests from landowners for information about alternative species. Due to time and cost restraints, it is not possible to effectively supply the information requested.

“In some cases ‘best practices’ have not been written down and reviewed by other experts. In some cases information is held in scientific papers and research institution records that are not readily accessible. In some cases there are ‘gaps’ in the knowledge base which further investigation or research are required to fill.”

“They collated and summarized information covering management operations such as establishment techniques, management regimes, forest health and marketing.”

– DENIS HOCKING



Growing together
2005-2009

2005

Adapting dryland farming to climate change

Seven years of dry weather and relentless wind erosion in the early 2000s had devastated the Flaxbourne-Starborough landscape of South Marlborough, one of the country's earliest farmed areas.

Doug Avery's Grassmere farm Bonavaree was one of those affected. "Over-grazing during the long dry was harming the financial, environmental and emotional sustainability of the farm," recalls Barbara Stuart, regional co-ordinator of the NZ Landcare Trust (NZLT). "People like Doug were stressed, heartbroken, even a bit ashamed about what was happening."

In 2004, NZLT helped bring a group of locals together to form a soil conservation group – and successfully apply for SFF funding. The late, revered Awatere farmer John (JL) Peter became the Starborough Flaxbourne Soil Conservation Group (SFSCG) chair. The focus was on six key areas: farming systems, soils, dryland plants, human impact, landscape options and climate. Bonavaree became the project's focus farm.

The idea gained momentum locally, soon spreading to the dry east coast of both islands. Barbara Stuart recalls the stir among workshop participants one day

in 2005 when systems analyst Graeme Ogle, one of the specialists on hand, proposed a new seasonal grazing system for affected farms.

"The Avery family already knew a lot about lucerne. But Doug immediately sniffed out the potential for using it as a green feed rather than a supplement – a way to rapidly grow lambs so they are finished before the summer dry sets in. Soon he was using it at Bonavaree – and the results have been remarkable."

The lucerne breakthrough was only one of the measures flowing out of this landmark project centred on the challenges of adapting dryland farming to climate change.

In 2008, around 400 people gathered at Bonavaree to attend a "Beyond Reasonable Drought" field day. That year the SFSCG won a prize for showing leadership in helping improve farmland affected by drought.

As Doug Avery said: "The moment of truth came when I realized that we could not keep on farming as we were, if we were to remain financially and environmentally sustainable."



Top left: Grasslands' conference delegates check out saltbush planted to conserve eroded soil while providing fodder for stock.

Above: Fraser Avery addressing the Beyond Reasonable Drought field day of 400 participants.



Ewe hoggets finish off a lucerne stand in the summer dry.

Top right: Valley floor plantings of lucerne take advantage of the deepest soils and rainfall run-off from hillsides.

Above: Protecting remnants of native vegetation.

2005

Farewell Scotch broom

Soft, yellow-flowered Scotch broom might appear harmless. Dense thickets of the weed, however, continue to infest swathes of productive farmland, especially foothills and high country tussock land.

In recent years, biological control has become a critical ally in the war on broom, a fast-growing weed that threatens native plants. Landcare Research scientist Hugh Gourlay places it as possibly our worst environmental and productive sector weed in New Zealand.

“For a century, farmers had been spraying and grubbing gorse, but ignoring broom, and that’s been to its advantage. Gorse is relatively stable but broom keeps invading and smothering new areas,” he says.

In the early 2000s, worried North Canterbury farmers rallied to stop its spread. The Canterbury Broom Group and Hugh Gourlay later gained SFF funding in 2006 to import and release biological agents to control broom: a gall-forming mite, a foliage-feeding beetle and a foliage-feeding moth.

The beetle was the first to be released. It and the moth have since established in limited sites around New Zealand.

The gall-mite has established at well over 500 sites. “It has reduced broom populations by up to 90 percent and at around 50 percent at a number of release sites,” said Hugh.

Hugh recalled that the impact on broom didn’t take long to show: “David Rutherford, the late Canterbury Broom Group chair, once told me that this project was for his great grandchildren. But we were delighted to note he witnessed some of the early benefits for himself,” Hugh said.

Hugh points to additional positive spin-offs, such as better access to rivers, and improved scenic and natural values. He also cites second-round benefits, such as further employment in transport and product processing beyond the farm gate.

The economic benefits to New Zealand from the reduction in broom by the gall mite alone are calculated at around \$20 million per annum.

2005

Sweet success for corn toolkit

In 2005, the sweet corn industry decided to consolidate the expert knowledge and experience gained by sweet corn growers over many years – and also relevant information contained in previous scientific reports. A resulting “sweet corn toolkit” developed as part of an SFF project became the industry benchmark.

“We knew there was significant information out there, but we wanted to capture it and make it more accessible to growers in the one package so growers could use it to maximize their profitability while also increasing their quality and production volumes,” recalled project leader John Seymour, General Manager at Process Vegetables NZ.

An early step was assembling a project advisory group made up of grower and processing company representatives to map out the content of the toolkit. Science and industry experts contributed their knowledge, ensuring the most relevant, up-to-date, practical information was included.

“Included was information on plant growth and crop physiology; growing site selection; cultivation and plant nutrition; crop establishment; weeds, pests, diseases; irrigation and water management; and harvest and post-harvest handling.”

– JOHN SEYMOUR

Additional chapters included assistance with trouble shooting and an extensive list of further resources.

The suite of resources finally released in 2008 included a crop manual (printed and CD-ROM

formats), an accompanying field notebook (ute guide), a production calculator plus a yield and fertiliser forecaster.

“The sweet corn toolkit has continued to be held in high regard in the ensuing years, and provides a benchmark model for other crops including peas, beans, carrots and beetroot,” said John.

“The project was a strong argument for improving practical technology transfer across the vegetable industry and for developing relationships between growers, processors, and supporting industries including scientists,” he said.

At the end of 2016, the Process Vegetable NZ Research Board reviewed the toolkit and contracted Plant & Food Research to update it in a new pdf format and publish an updated ute guide. New features include crop development and growth, and site selection and this has now been distributed to all fresh and process sweet corn growers.



2006

Slowing the spread of wilding conifers

Wilding conifers continue to invade our high country; young trees cloak nearly two million hectares, advancing by up to five percent a year. They compete with native flora and fauna for sunlight and water, and can disrupt natural landscapes.

Work on controlling these runaway pests began in 2006 after scientist Nick Ledgard convened a group of farmers and other stakeholders in Christchurch. The result was a Wilding Conifer Management Group (WCMG) that successfully gained SFF funding, in time becoming a national authority on wilding awareness.

Getting everyone together in one room really helped. “For the first time all the stakeholders with wilding concerns were meeting regularly and ‘singing from the same songsheet’,

although it did take some time to persuade some bodies to come to the party,” he said.

“The SFF money allowed us to run a comprehensive research programme aimed at answering the key operational questions around dealing with wilding spread,” Nick recalled. The project began in mid-2006 and ended in 2010.

Members had three key objectives. First was mapping the extent of the problem, determining key drivers and finding simple ways to predict spread risk. Next came reviewing control options and getting that information out to end users. Determining vegetation successions associated with control was the last.

“Mostly we want reversion to native species, so we investigated what control options would help bring that about,” Nick said.

The many outputs flowing from the project included a spread risk decision support system (DSS) to assess wilding spread risk on any given site. Maps, a practical handbook for control methods, and a website were among the others.

Project work culminated in a *2011 Wilding Conifer Status Report* document, a crucial input into the NZ Wilding Conifer Management Strategy 2015–2030.

Nick says he’s proud of what the WCMG has achieved to date. “It would be fair to say that the Budget 2016 announcement of \$16 million for wilding control over the next four years is directly linked to the work done under SFF.”



Nick Ledgard, Manager of the SFF wilding project, talking to field day participants, Flock Hill station, upper Waimakariri catchment.



Peter Willemse, DOC ranger, at a workshop near Twizel in the Mackenzie Basin.



Wilding contractor, Wayne Godfrey, demonstrating use of wilding control tools to farmers at an SFF end-user workshop near Queenstown.

“The Decision Support Systems are now used by many territorial authorities to determine risk of spread from new plantings, and are a part of the forest industry’s best management practice toolbox.” – NICK LEDGARD

2007

Saving the Sherry River

Farmers living around the Sherry River, below the ranges of northwest Nelson, reeled in 2001 as a study showed cows crossing their pristine stream had made parts of it unsafe for swimming.

“The news was a shock to landowners who felt hurt and surprised,” recalls Barbara Stuart, regional co-ordinator of the NZ Landcare Trust (NZLT).

“Locals and their families have always used the river for drinking water and recreation without harm. The problem of unwanted bacteria and sediment had quietly arrived as farming and forestry became more intensive.”

A farmer-led Sherry River Catchment Group, initially assisted by NZLT and then SFF after 2007, came together to tackle poor water quality revealed in the analysis by local scientists, *Cows in Creeks*.

A three-year project led to development of Best Management Practice information and Landowner Environmental Plans specific to the requirements of individual farms and land uses along the Sherry River. Sixteen such plans were subsequently drawn up.

“This included all working farms – dairy, sheep and beef farms, two forestry companies, a free-range poultry farm and other small landowners in the catchment,” Barbara recalls.

Work has not ended there. Three major bridges have since been erected over the Sherry River, and a fourth, formerly used for farm vehicles is now used to cross cows. Thousands of plants have been dug in along waterways, and 5018 metres of fence laid.

By halting the practice of cows crossing through the river, a 50

“By working together the people of the Sherry were able to set their own targets and have a collective voice.”

– BARBARA STUART

percent improvement of water quality was achieved. A second report *Cows out of Creeks*, noted this great achievement, attracting nationwide coverage and making the Sherry a beacon project for other areas. In 2009, the Sherry River Catchment Group were First equal winners of the Tasman-Nelson Environment Awards for that year.

For Barbara Stuart, the story shows what can be achieved when landowners apply the scientific knowledge now available, ensuring their farms remain environmentally sustainable and productive for future generations.





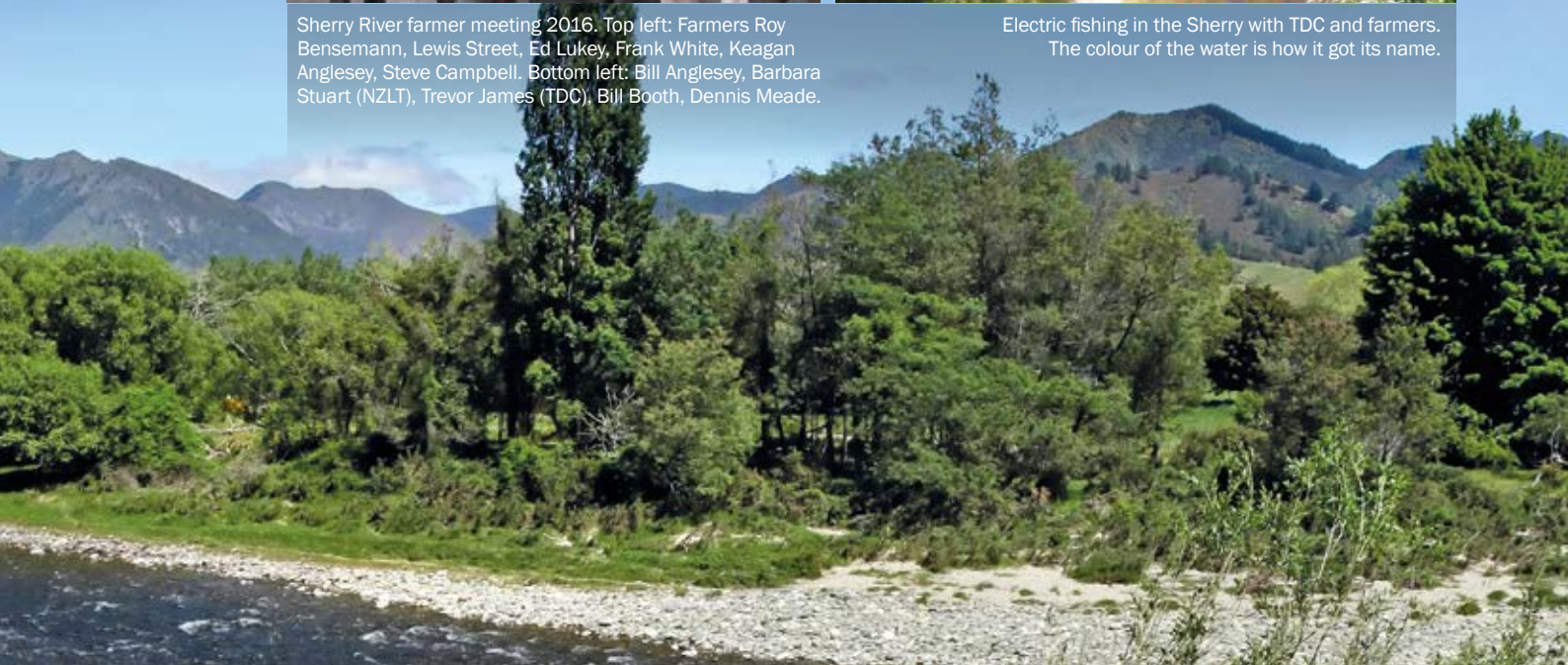
Andrew Fenemor (Landcare Research) presenting key information to the local Sherry community.



Sherry River farmer meeting 2016. Top left: Farmers Roy Bensemann, Lewis Street, Ed Lukey, Frank White, Keagan Anglesey, Steve Campbell. Bottom left: Bill Anglesey, Barbara Stuart (NZLT), Trevor James (TDC), Bill Booth, Dennis Meade.



Electric fishing in the Sherry with TDC and farmers. The colour of the water is how it got its name.



2007

Non-chemical control of kumara rots

An overseas ban on the use of postharvest fungicides on export kumara into the UK led the industry to explore less toxic alternatives.

In 2007, an innovative project that involved treating the kumara vegetable with hot water dipping (HWD) as an alternative control for fungal protection attracted SFF funding.

Kumara is prone to soft rotting after washing and before sale mainly due to a fungal pathogen. For many years local packhouses relied on a powerful fungicide to minimize these rots.

Overseas trials on sweet potato in the early 2000s suggested

that a 20-second rinsing and brushing in hot water could be a viable, simple and relatively cheap alternative solution.

Researchers from Plant & Food Research and HortResearch therefore visited packhouses in Dargaville to conduct trial runs, gathering information from packhouse operators and growers.

“The project undertaken unfortunately confirmed that HWD would not be a viable alternative treatment for export product, but that confirmation was essential to determining whether future export initiatives would include the UK or not,” recalled then-project leader John Seymour of Vegetables NZ Inc.

Although results from the project did show a drop in *Rhizopus* incidence when the product was removed from the packing line for the trial, the results were very inconsistent and negated the use of HWD as a reliable alternative solution.

“Despite the outcome, the project yielded important outcomes of great benefit to pack house processes. These include improved hygiene methods now standard practice in the kumara industry and which have made a real difference to the quality and consistency of the product being presented to consumers,” John said.

“After 15 years the market issue with kumara exports is no longer the same. But the project provided industry with a chance to undertake a major rethink of the post-harvest handling of its product. They realised the benefits of new technologies in packhouses and changed the way they operate accordingly.”

– JOHN SEYMOUR



2008

Tackling yellow bristle grass head-on

In 2004, yellow bristle grass came under overnight scrutiny after dairy farmers in the Waikato watched in alarm as this familiar weed made wild, incursions into their pastures. Worse, their cows wouldn't eat it.

Scientists and a farmers' action group, assisted by SFF funding across four projects, soon embarked on a series of activities to manage and control the weed that seemed to be proving unstoppable nationally. Herbicides and on-farm cropping were among the tools identified.

Measures such as blocking roadways as corridors for dispersal were successfully investigated. "After observing yellow bristle grass along roadsides before farmers complained about it, we demonstrated that the seed was moved by both roadside mowers and in cut maize for silage," project leader Trevor James of AgResearch recalled.

The most successful output, however, was unquestionably the *Yellow Bristle Grass Ute Guide*, an information booklet of which 15,000 copies were printed and distributed. It remains a vital resource.

The battle against yellow bristle grass has kept scientists

like Trevor busy over the past decade. "We've probably been involved in a hundred field days over that time, events all over the country. Farmers are not at all happy about this weed."

But was the enemy in their sights the right one? Only well into the war did Trevor James and fellow scientists realise they were up against a superweed: a vigorous hybrid of yellow bristle grass crossed with another introduced species of grass.

Trevor remains on the case. Fenoxaprop, a herbicide used to manage grass weeds in cereals, is helpful but needs regular application. The battle continues: "Right now it's a bit like using a .22 rifle to stop an elephant."

“When we made this discovery in 2016, it was a bit of a relief. The whole thing fell into place: the sheer vigour, the persistence of this particular weed suddenly made sense. It is the epitome of a superweed.” – TREVOR JAMES



Farmers discussing a patch of yellow bristle grass at a field day in south Auckland, March 2012.



Katherine Tozer addressing a field day crowd on yellow bristle grass, south Auckland.

2008

Preserving the past: The Open Orchard project

The concept of old, abandoned orchards, with rows of gnarled fruit trees bearing heirloom varieties of apples, pears, plums and other sweet fruit, has an undeniable aura of romance and nostalgia. But such locations, dotted around the regions, also represent unique storehouses of fading horticultural diversity.

In 2008, an Open Orchard project led by the South Coast Environment Society successfully sought SFF funding to secure the many old fruit varieties from local heritage orchards throughout Southland before they were lost.

Other aims of the project included stimulating interest in the planting of new home orchards, providing the grafted trees, rootstock and scions to establish them, and running local workshops teaching the grafting and pruning.

The project attracted considerable publicity including an appearance on *Country Calendar*. It continues to seize the imagination of local people

– and those as far away as England – with many coming forward to offer time and resources to help identify the varieties.

It feels like everyone has been touched by the project: people often say “Ah, you’re the ones saving the fruit trees,” recalled project leader Robyn Guyton. “It has become our group’s ‘flagship’.”

“We ended up being contacted by more than 100 people who told us where dozens of old orchard remnants, some dating back to 1853, were located.

“We visited each one, photographing, mapping the orchards and coding the trees. Each autumn we selected fruit from each tree, photographing them and recording their characteristics. Each winter we returned to gather and store scions for spring grafting.”

“We’ve saved at least 250 different apple varieties in Southland, and 20 each of pears and plums,” said Robyn. “We have only identified 80 of them so far and are uncovering rare treasures.”



The project has continued to gain momentum and support. The group is now establishing 12 Heritage Orchard Parks, returning replica trees of the early settlers into the areas they came from. The first four parks have been planted and were officially opened in April 2017.



Heritage orchard parks at Monowai (left), Tuatapere and Riverton.



2008

Restoring the trees of Te Urewera

Podocarp trees – toromīro, rimū, kahikatea, tōtara, mataī – have been logged from many forests, but the Tuhoe Tuawhenua Trust is seeking to restore these great trees in their forests at the heart of Te Urewera.

Trustees envisage this regeneration activity as a key biodiversity goal but also as a way to create jobs for Tuhoe people through an associated indigenous forestry venture.

In 2008, the SFF provided funding for a three-year project based on podocarp restoration, canopy manipulation and a tawa harvest feasibility study in a large tract of land about Ruatahuna. The project involved a range of stakeholders, government agencies and local hapu and organisations. Landcare Research provided a research component and overall advice.

The project involved transplanting out naturally occurring seedlings in the first stages, and releasing seedlings and saplings in later stages. People from four hapu were involved in this activity.

“Over 4000 plants were dealt with: a total

of 3830 seedlings were transplanted, 455 seedlings were released and 270 poles and saplings were released,” said project leader Brenda Tahī.

“In nearly all patches of transplanting or releasing the predominant podocarp species was rimū, followed by toromīro or kahikatea then mataī. In about half of our restoration locations, most seedlings were transplanted into shaded or partly-shaded areas. Overall the survival rate was good,” she said.

“Coupes” in the forest were created where the tawa canopy was opened to create smaller gaps, and in which podocarps were planted. The growth and survival of seedlings is being monitored, along with the growth of trees at the edges of the coupes.

“We were blessed to learn a lot about podocarp restoration and canopy manipulation. We found that we could mount a restoration programme using seedlings from our own lands and make it an integral part of tawa harvest where it is undertaken in small coupes,” said Brenda.

“These trials proved extremely valuable. We gained new perspectives on regeneration methods and where that fits with tawa harvesting. We have since decided not to go ahead with tawa harvesting as the economics are not currently favourable for selective harvesting in a forest such as ours. That’s OK for us – we have very long-term timeframes for our forests and we’re in no hurry.” – BRENDA TAHI

2009

Utilising laser scanning in horticulture

A remote sensing system based on laser technology has proved itself as a valuable precision tool in European horticulture.

British apple orchards have successfully used Laser Imaging, Detection And Ranging (LIDAR) to sense chemical application rate requirements for trees of different sizes and densities. This project evaluated LIDAR use on a range of local apple, avocado and winegrape canopies at different growth stages, said project leader Dr David Manktelow.

“We compared LIDAR scan data with physical and other canopy measurements to assess its potential in areas like quantitative pruning assessments, yield potential assessment and block variability mapping.”

Overall, the project sought to demonstrate LIDAR technology and its potential uses to local industry and associated industry researchers. As part of the trials, the LIDAR unit was mounted on a vertical stand fitted to a tractor three point linkage to allow scans along orchard and shelter rows, David explained.

“The barriers to practical implementation of this technology have been cost, mechanical reliability in a tough environment and the computer processing capability (and programmer ability) to cope with truly

massive datasets. All three problems are being overcome, with costs of the technology dropping dramatically.”

Lincoln Agritech has since successfully implemented a prototype sprayer control system based on LIDAR readings that can process data to differentiate between crop training wires and posts and turn sprayer nozzles on and off in the presence or absence of the crop canopy.

David said the project provided local researchers and consultants with a useful opportunity to see LIDAR technology at work and gain some understanding of its potential uses and limitations.

“The software we had in 2009 to run the hardware and to process the data provided useful results, but was not

In 2009, a project to introduce and test the technical and practical feasibility of LIDAR (Laser Imaging, Detection and Ranging) technology for measuring local fruit crop canopies attracted SFF funding.

reliable enough to immediately apply the technology in the industry in a commercially useful way.

“However, work with LIDAR in local fruit crops has continued. Dramatic reductions in hardware costs and improvements in reliability and software processing capability have reached a point that will see effective applications in local horticultural research and in commercial production.”



Slope data of an area in Northland taken by LIDAR. Photo: Landcare Research.

2009

The dirty business of dung beetles

Unprocessed dung is a blight, coating up to five percent of pastures at any one time. Our livestock produce over 100 million tonnes a year, enough to fill 41,000 Olympic-sized pools. Depending on the time of year and climate, manure pats can take as much as six months to break down.

Right across the world – except here in New Zealand – tiny dung beetles have evolved to process such manure by first burying it, then using it as a food source and breeding site. They naturally – and speedily – process the dung of sheep, cattle, deer, goats and other domesticated livestock.

In 2010, the Dung Beetle Release Strategy Group with SFF support, was established to import and release up to

eleven of the dung-smashing species that, in other countries, have manure pats buried within 48 hours.

Project manager Andrew Barber explained: “Dung beetles should have come here 150 years ago with the first cows and sheep, but they didn’t. Introducing dung beetles is the first step in making it right.”

Three years after the project began, following a lengthy approval process, came the first in a series of releases in both North and South Islands.

The beetles are now available for commercial purchase – and have already seized the imagination of many landowners. They grasp the potential environmental and economic benefits of introducing them.

“We don’t expect any impact of exotic dung beetles on native dung beetle as the native species have evolved to live in deep forest, while the introduced beetles are limited to open grassland.” – ANDREW BARBER

“We expect these tunneling beetles to enhance pasture growth, soil biodiversity and increase the numbers of other beneficial organisms such as earthworms, along with reduced nutrient leaching and overland flow of *E. coli*,” said Andrew who is now mass rearing, researching and selling them through a private company.

“They’ll also play an important role in reducing the incidence of infective stages of livestock diseases in pastures.”

Nor are there any significant adverse environmental effects forecast. The Environmental Protection Authority process was extremely rigorous.



Above: *Copris hispanus* field collected in West Australia bound for the Landcare Research Tamaki containment facility in New Zealand. Photo: Dr Shaun Forgie, Dung Beetle. Innovations.

Left: Farming for the future – Andrew Barber and his daughters release dung beetles. Photo: Andrew Barber, Agrilink NZ.

A photograph of two men in an orchard. They are standing behind a long line of red plastic crates filled with ripe, yellow-orange fruit, likely peaches or nectarines. The background is filled with lush green trees and foliage, suggesting a healthy and productive orchard. The men are wearing casual work clothes and caps, and appear to be inspecting the fruit. The overall scene conveys a sense of agricultural success and care.

Cultivating success
2010-2017

2010

Establishing the use of extra-durable eucalypts

In a warming world, our dry regions need sustainable land use options. The warmer parts of eastern New Zealand continue to face low and unreliable rainfall.

The New Zealand Dryland Forests Initiative (NZDFI) is working to establish forests of genetically improved eucalypts suited to these dry environments. It aims to develop a new industry based on naturally durable timber and specialty wood products.

In 2010, NZDFI successfully gained SFF funding to establish trials of durable eucalypts from Bay of Plenty to North Canterbury. These included establishing breeding populations and demonstration trials on sites provided by participating landowners.

“Our research work generated significant interest and support from farm foresters, iwi and corporate forest owners as well as regional councils in Marlborough, Canterbury, Wairarapa, Gisborne, Hawke’s Bay and Bay of Plenty,” recalled project leader Paul Millen.

“Landowners and potential growers instantly grasped what we were wanting to achieve. They readily offered sites for our trials, fenced the site if required and helped establish the trial.”

Over three years the project established trials of eleven species at 17 sites. A total of 120,000 trees were planted in 2011 and 2012.

On the successful completion of the first project, NZDFI gained a second SFF grant to measure and manage

demonstration trials with technology transfer to landowners.

“Breeding trees takes a very long time but we’re happy with progress to date. We sometimes compare it to a game of cricket. We feel we have won the first innings.”

The initiative was extended to new landowners and regions in 2013 and 2014, with a focus on species-specific management of the existing and planting more trials.

The NZDFI vision is to diversify local timber supply by establishing 100,000 hectares of trees – and making high-quality durable hardwood available locally in place of some of the \$270 million of hardwoods imported each year.



“The key all along has been helping our landowners and growers get optimal success from these trees. That includes research and training in silviculture. We want growers to know and understand the differences to managing pine trees.” – PAUL MILLEN



NZDFI durable eucalypt demonstration trial planted in 2011 overlooking Marlborough vineyards by Christo and Jo Saggars.



Clive Paton of Ata Rangi wines speaks about his use of durable eucalypt strainer posts at a NZDFI field day in Martinborough vineyard, Wairarapa.



Field day attendees inspect NZDFI durable eucalypt breeding population planted in 2011 at John and Robyn Cuddon's property in Marlborough.

Left: NZDFI durable eucalypt demonstration trial planted in 2011 on Gisborne hill country property by Bob Wishart and Meg Gaddum.

2011

Eliminating thrips in export apricots

Sweet, firm New Zealand apricots are prized in overseas markets, but discerning consumers and stringent border controls have caused exporters to explore environmentally friendly ways to disinfest the fruit before it leaves.

In 2011, industry body Summerfruit NZ successfully gained SFF funding for a project to investigate reliable, non-toxic postharvest disinfestation technologies for controlling insect pests such as flower thrips.

The four-year project ended up with new treatment technology that is helping to pave the way for smoother market access for New Zealand's export apricot industry.

"The maintenance of present export markets and the expansion into new ones requires the ability to ensure the fruit is free of quarantine pests," said chief executive Marie Dawkins. "Control of thrips remains our largest pest control issue and is therefore a crucial issue for us."

"We have recognised the need for an eco-friendly, safe answer to today's fumigation challenges for a long time and have directed considerable resources to finding a solution that satisfies both us and our trading partners."

Research conducted by Plant & Food Research in the first year of the project determined that a more benign agent – ethyl formate (EF) + CO₂ – might be an effective treatment against these pests.

A series of treatments were then carried out at a range of temperatures, confirming the efficacy of EF. The industry has since been quick to adopt it.

"EF technology is great; it kills the thrips and doesn't damage the sensitive skin of the fruit. In short, it has turned out to be the breakthrough we were hoping for – and we expect it to become the standard procedure for postharvest disinfestation," said Marie. "The technology is also both relatively easy to set up and cost-effective to use. Several of our export packhouses have now picked it up – and over time, we expect the others to add this treatment to their operations. This project ended up being a really good news story for us."



“The technology is also both relatively easy to set up and cost-effective to use. Several of our export packhouses have now picked it up – and over time, we expect the others to add this treatment to their operations. This project ended up being a really good news story for us.” – MARIE DAWKINS



Checking the monitor.



Vapormate set up.



Vaporiser unit.

2012

Uncovering the mysteries of mussel spat

Seed material (spat) collected at Te Oneroa A Tohe (Ninety Mile Beach) is used to stock about two-thirds of Marlborough mussel farms. But too little is known about the quality and viability of this critical ingredient of a \$200 million export industry.

In 2012, the Marine Farming Association successfully gained SFF funding for a project aimed at safeguarding the quality and sustainability of Kaitaia spat through field sampling and the adoption of industry best practices.

“We realised as an industry that it was vital to ensure these supplies continue and for protocols and for a testing regime to be put in place to ensure the quality and viability of this spat,” said project leader Debbie Stone.

“It is a major cost to a marine farmer if spat is purchased, seeded out and fails to grow.”

The first stage of the three-year project involved formation of a working group with specialist technical support, where variables

of spat survival and retention were discussed. The first of several trips to the Far North took place.

The project went on to become of a wake-up call to the industry, Debbie recalled.

“We realised how little we all knew about the condition of spat and its retention. Cawthron Institute scientists helped us a lot, providing information about screening spat for size and developing a spat stress testing kit.”

The other vital output was an industry-wide Code of Practice for the handling of Kaitaia spat from the beach to the marine farmer. Approved in 2012, this covers collecting, handling, storing, packaging and seeding onto mussel farms.



“This kit has become a vital tool in a testing regime to assess the viability of spat when it reaches the mussel farmer and when it is seeded out on the farm.” – DEBBIE STONE



Top: Kaitaia spat seeded on lines in the Marlborough Sounds. Photo: Aquaculture New Zealand.

Right: Kaitaia spat on seaweed. Photo: Greg Taylor.

2013

Cultivating a future for kōura

The freshwater crayfish – kōura – is familiar to generations of Kiwis raised around streams and creeks, but growing habitat loss has seen these iconic creatures classified as a threatened species.

Forest company Ernslaw One Ltd’s decision to stock kōura in hundreds of fire-fighting ponds across forests in Otago and Southland, supported by SFF funding, is now helping secure their future.

This 2013 project also helped awaken the potential of a commercial market for their sweet, succulent, delicate flesh, says project manager John Hollows. The company is now harvesting and marketing kōura – and getting good reviews for the delicacy from restaurant chefs and food critics.

He believes the project has created better understanding of what kōura need. Additional kōura farms are already being planned in locations in both the North and South Islands.

“This is New Zealand’s first large-scale extensive crayfish operation and there’s been no model to follow. We are fortunate, within the Ernslaw company, to have people who demonstrate good lateral thinking to help find practical solutions. Ngāi Tahu have also been really helpful.”

“As a result of this project we have been able to replicate natural habitat

type throughout rain or spring-fed ponds in an extensive aquaculture setting,” he said.

A second project output, the booklet *Freshwater Crayfish farming: A guide to getting started*, has found a wide readership and is helping ignite interest around the country.

“It provides an update on current information about kōura farming with sections on permitting and biology. It gives those interested in kōura aquaculture a good level of understanding when starting out,” explains John.

“This project helped provide a unique opportunity to farm a native species and sell them. I can’t think of any other species worldwide that provides a mix of environmental, conservation and commercial values.” – JOHN HOLLOWES



Forest company Ernslaw One Ltd stock kōura in hundreds of fire-fighting ponds across forests in Otago and Southland. Photos: Ernslaw One Ltd.



2013



Saving grapevines from trunk diseases

Wine regions across the world, including New Zealand, all face the reality of grapevine trunk diseases. Fungal spores infect wood, affecting both yield and quality, and posing a threat to vineyard sustainability.

A recent SFF-funded project by New Zealand Winegrowers to study the local extent of trunk diseases in vineyards brought some good news, yielding a range of practical tools for managing the diseases and lifting industry awareness.

“Trunk diseases are a looming issue for local winegrowers – and with replacement cost of a vineyard hectare at \$50,000, a potentially expensive one,” said NZ Winegrowers General Manager Research and Innovation, Dr Simon Hooker.

The project began in 2013 with a

survey of more than 700 vineyard blocks in Hawke’s Bay, Marlborough and Central Otago, consisting of 22 varieties, ranging from 4 to 33 years of age.

This work found that Malbec, Cabernet Sauvignon, Chardonnay, Syrah and importantly, the dominant Sauvignon Blanc, were the local varieties most susceptible to trunk diseases. Merlot, Pinot Gris and Riesling were the least.

Simon said that vines that were 15 years old or more were more likely to have symptoms of the disease.

“Given the average age of vines in Marlborough and Hawke’s Bay is 12 years, and that Sauvignon Blanc was found to be most susceptible, it is likely that we’ll detect more trunk diseases in vineyards over the next decade if strategies are not implemented.”

The project also included evaluating fungicides to apply to pruning wounds on vines, the most common point of infection. Data from the evaluation was then supplied to fungicide companies, a number of which have subsequently applied to add the procedure to their label directions.

Simon said the project had been a significant capability building exercise for the industry – and that useful tools had been produced, including cost-effective methods of applying the fungicides.

“These new methods are already being adopted by industry as the fungicides become available.”

– SIMON HOOKER



Trunk diseases are a looming issue for winegrowers.



2014

Advancing the New Zealand deer industry

The New Zealand deer industry is renowned for its passion and motivation, but individual farms have often grappled with productivity challenges that limited profitability.

The deer farming community therefore decided to trial a unique initiative with help of SFF funding – known as Advance Parties – to identify and implement focused opportunities to lift farming profits, with a view to increasing export sales of venison.

In 2014, six Advance Party groups were set-up, each involving six to eight farmers, each actively bringing on-farm issues to the table, and each working with their peers to hammer out real world solutions.

Describing Advance Parties as an “efficiency story”, Deer Industry New Zealand (DINZ) chief executive Dan Coup said he believed deer farmers were collaborative by nature and wanted to learn from each other.

He applauded how all Advance Party participants readily agreed to commit to what was a novel concept,

including adopting management changes, recording their outcome and sharing them with the wider deer farming community.

“DINZ provided an independent facilitator for each party, technical back-up and the ability to collect and collate farm data.”

Since 2014, the Advance Party concept has gone from strength to strength, with regular, well-attended regional and national workshops addressing a range of practical issues including fencing, fawning and feed utilisation.



Dan noted that 24 groups were now operating nationally, twice the number that had been anticipated when the concept was first floated a few years ago.

The uptake of the Advance Party concept shows that many deer farmers are motivated to try new things when they can see changes, relate them to their own farms and are able to trial them, he said.

“Above all, the benefits are not just limited to the participants. They are a way to test and refine profit gain opportunities and to demonstrate those methods (and their limitations) to the wider deer farming community.” – DAN COUP



Advance Party group, Dawson Downs.



2014

Optimising copper-use in the fight against Psa-V

Following the shock discovery of bacterial disease Psa-V in Te Puke kiwifruit orchards in 2010, the industry has been going all out to protect the vines and reduce the impact of the disease. Copper has since become a useful weapon in the arsenal.

In 2014, industry body Zespri Group Ltd received SFF funding for a project to trial the sustainable use of copper compounds as a frontline tool in the fight against this virulent disease, also known as kiwifruit canker. Copper-based sprays have already proven themselves across horticultural industries as a highly effective way to reduce the production of spores from the cankers.

“Overall, we now have a highly effective tool as part of our management plan for Psa.” – ELAINE GOULD

“This project represented a great three-year collaboration between researchers and the industry. Along the way, we built up a good body of knowledge about copper retention, Psa survival and best spray practices,” said project leader Elaine Gould of Zespri Group Ltd.

Copper kills bacteria on contact, but successful use of it in fighting a disease like Psa depends on both an even distribution and good retention of the copper across all plant surfaces.

“We now know a lot more about how long copper hangs around after application. Interestingly, about two

weeks seems to be the number. We also have to get the toxicity levels right so we don't compromise the vines and quality of fruit, and have been working with suppliers on that,” said Elaine.

“Copper has been a key player in our control programme against Psa, and we now have a long-term sustainable programme in place.

“We know a lot more about how long it lasts on the leaf, that it helps to spray it immediately after winter pruning, at bud break and around a significant weather event.

2015

Pathway for the Pomahaka

In 2013, NZ Landcare Trust (NZLT) initiated a project in the Pomahaka catchment in southwest Otago in response to poor water quality. Funding support was gained from SFF, bringing farmers and other stakeholders together to scope a plan.

A Pomahaka Stakeholders Group identified the factors having a negative impact on water quality, and developed a plan which focused on sharing information, and collaborating to get greater adoption of good management practices on farms.

Farm owners who have long cherished the wild river as a spot for picnicking, swimming and fishing formed a Pomahaka Farmers Water Care Group (PFWGC). The aims were to take ownership of the issue, engage with other farmers and identify what the water quality was like throughout the catchment and promote in a positive way what farmers were doing to improve it.

In 2015, the “Pathway for the Pomahaka” initiative, developed in conjunction with NZLT, gained further SFF funding and co-funding from Ravensdown, DairyNZ, Beef + Lamb New Zealand, Ernslaw One and Rabobank.

Farm owners have since been busy, harnessing and showcasing a range of industry tools enabling them to improve practices and infrastructure, to reduce nutrient loss and improve water quality. Through membership of the PWCG they have paid for regular water quality monitoring across the sub catchments which has identified issues with sediment, phosphorous and nitrogen, as well as *E.coli*.

The project continues to resonate with farm owners, dairy, sheep, beef and some deer. The landscape is mixed and includes mountainous tussock country in its upper reaches, with rolling, more intensively farmed hill country and lowland flats. Some 120

“People say landowners don’t care about the health of rivers. That’s not true. They want them swimmable for their families and future generations and that was the key driver here.” – JANET GREGORY

farmers have joined the PWCG, about half of the total in the area.

“Farmers need to know what’s coming off their properties. Keeping soil and nutrients on the farm is good for farm productivity and waterways. This is an issue for all farm types in the catchment and we need to work together to improve water,” said Chairman Lloyd McCall.

2015

Connecting children with food production

A new open online teaching resource is helping Kiwi school children take a fun and informative look at the science of food production, including how long it takes for food in a lunchbox to go mouldy.

Launched in 2015 with the help of SFF funding, the Soil, Food and Society project provides lesson plans, videos and fun experiments to primary and intermediate school pupils.

Key aims of the three-year project include raising awareness among young people of opportunities to work in the primary sector – and providing an innovative model of support for science teachers.

Soil, Food and Society helps teachers lead year 5-8 students on an inquiry that considers the key message: nutrients in the air and earth are the same nutrients we eat in our food.

It integrates essential subject matter and inquiry resources with the New Zealand Curriculum, specifically identifying science curriculum objectives and embedding the Nature of Science and Science Concepts using primary industry examples.

The resource is free to use and will continue to develop as teachers use and support it.

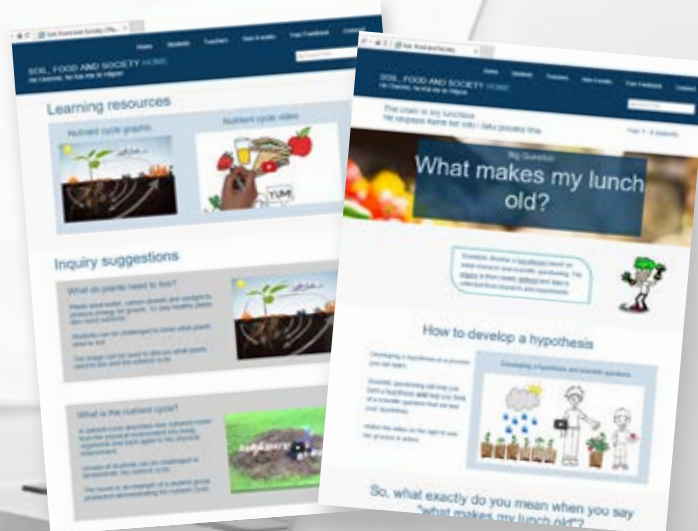
“Kids are a great place to start. We want switched-on kids coming through to work as farmers, growers and consultants.” – TESSA MILLS

“We’re 18 months – about halfway – into this project and we’re pretty pleased with progress to date,” said project leader Dr Tessa Mills from AgResearch.

“We’re busy seeking teacher feedback at the moment, finding out what the teachers are keen to use, and integrating it with the story of where our food comes from. There’s a lot of back and forth going on.”

Tessa said that food production contributed significantly to New Zealand's economy, so it was valuable for Kiwis to understand and appreciate it.

Contributing partners include Ballance Agri-nutrients, DairyNZ, Horticulture New Zealand, Fertiliser Quality Council, Ravensdown Ltd, Core Education, New Zealand Young Farmers, Federated Farmers, Irrigation New Zealand, and House of Science.



2016

Growing the demand for New Zealand olive oil

The 400,000 olive trees within New Zealand groves are capable of producing around 1.8 million litres of high quality oil. Current production, however, is less than one-quarter of that amount – and local olive oil sales could be much higher.

In 2016, industry body Olives NZ successfully applied for SFF funding to increase market share by identifying basic grove management practices to help growers lift productivity of fruit per hectare – and reduce their costs.

The project is seeking to identify and model changes that enhance tree and grove productivity in critical areas such as controlling leaf disease and restructuring tree canopies. A large number of “focus” grove visits and field days have already been carried out.

A major focus in the first year has been on providing hands-on advice to growers in a range of focus groves with the aim of controlling leaf disease

with affordable protectant spray programmes.

“Here the aim is to eliminate foliage diseases that defoliate olive trees, a primary cause of low productivity in New Zealand groves,” said Gayle Sheridan, Olives NZ executive officer.

“We’ve also been introducing practical, affordable tree pruning regimes that improve light distribution for stimulating flowering and fruit growth, aiding effective spray coverage and inducing adequate annual shoot growth to provide the required bud sites for new flower production – on an annual basis.”

Gayle said suggested regimes of pruning and proactive spraying have already had an impact: “The consultants recommended a secondary pruning, with some growers reluctant to cut off branches loaded with fruit. Those that did, however, were rewarded with arguably a better quality crop,



Demonstration of grafting, Mangawhai.

resulting in plumper fruit with a higher yield of oil and able to be harvested earlier.”

The issue of biennial bearing will be addressed in the project’s second year. “This is crucial in being able to establish and maintain an increased market share. Previously the swings were 30 kg per tree in a good year and no crop worth harvesting in an off-year.”

“What came as a big surprise was how quickly the groves responded to the new regime. When they saw the results, growers quickly adopted the practices.” – GAYLE SHERIDAN

2016

Combating the Giant Willow Aphid

In 2013, a colony of giant willow aphids (GWA) was found in Auckland. News that these oversized intruders had arrived here posed an immediate threat to the health of willow trees nationwide.

Bees, too, are at risk. Willows produce pollen and nectar, vital to bees in early spring. Even worse, the honeydew exuded by GWA feeding on the sap of willow stems is gathered by bees and affects honey quality. This honey contains different sugars and crystallises in the honeycomb, hence it is referred to as “cement honey”.

The aphid honeydew also feeds wasps, which are damaging to bees, and are a public health nuisance.

Aphids are now present year-round, with numbers increasing substantially in late summer when large colonies develop on host trees. They have

since spread as far as Southland. Over 50 types of willow are susceptible, and poplar, apple and pear trees can also be infested.

In 2016, SFF funding was awarded to Crown Research Institute Scion for a three-year project to seek biological control of GWA, identify willow cultivars resistant to GWA and investigate short-term control options. Partners include Apiculture New Zealand and the New Zealand Poplar and Willow Research Trust.

Leading the project is Scion scientist Stephanie Sopow. She recently visited California to scout out a parasitoid, a natural enemy that does its work by laying eggs in the aphid’s gut, which then hatch, feed, and pop out, killing the aphid.



Toni Withers and Stephanie Sopow in Scion’s containment facility.

“It’s pretty gruesome but in its natural habitats of Eastern Asia and California the parasitoid keeps the aphid under control,” she said.

“Our first task is locating the aphids overseas again, and finding ones containing parasitoids. Then we have to ship the aphid/parasitoid combo here into our secure containment facility.”

“We create populations of the parasitoid on colonies of giant willow aphids and conduct extensive testing to ensure the parasitoid will not harm our native aphids.”

“There are a lot of critical steps along the way, but this type of thing has been done successfully before.”

Mounting industry concern over the spread of GWA has seen Scion fast-tracking steps to locate biological agents overseas, and gain EPA and MPI approvals to import them into containment for testing.

2017

Facing up to facial eczema

Facial eczema remains a serious, recurring problem across many dairy farms. Cows are afflicted by a toxin found in the spores of a common pasture fungus.

A Facial Eczema Action Group, supported by SFF funding, is working to deliver improved prevention of the disease by providing evidence of the production cost and welfare implications for cattle when the disease is sub-clinical.

“Ultimately a better managed facial eczema programme will make a difference to the welfare, productivity and sustainability of national pastoral farming operations,” said project leader Emma Cuttance.

The disease proved especially prevalent in 2016, and in a warming

world, the signs are that it will not be disappearing anytime soon.

As part of the two-year project, Emma is especially keen to gather a body of knowledge that actively helps alleviate suffering from undiagnosed facial eczema.

“I honestly don’t know how the more badly affected animals keep going. This toxin completely ruins their livers. These animals on dairy farms must be stressed, maybe nauseous and most definitely depressed,” she says.

She’s also determined to keep debunking the many myths that surround the lethal disease.

“Some of our earlier SFF-funded work in this area helped dispel the idea that spreading lime on pasture would prevent it. I’m also concerned about

myths that zinc doesn’t work, and that rain washes away the spores.”

She supports prevention measures such as farmers taking out a microscope and monitoring eczema spore counts on their properties.

“Pasture spore counting is an effective way to keep up with spore count trends and understand the likely risk. Blood tests are another crucial tool.”

Emma is certain that better, more informed management of facial eczema can enhance pastoral farming.

“There are so many things that farmers can do here. We just have to get the message across.”

– EMMA CUTTANCE



2017

Training tomorrow's Māori orchardists

Māori kiwifruit growers have been significant players in the horticultural industry for decades, with collectively-owned trusts now running flourishing orchards across the Bay of Plenty, Gisborne and Northland.

Aware of the potential contribution of new technology and systems to production outcomes, a growing number of governors/trustees and orchard managers acknowledge the need to address gaps in their understanding of the business. They realise this can limit the ability of trusts to maximise returns for the whanau members they represent.

The aim of the Ka Matau Ka Ora project, funded by the SFF in 2017, is to overcome this hurdle. Drawing on a Māori-centred mix of learning, knowledge transfer and transformation, it will grow capability at both boardroom and on-the-ground level, and, vitally, ensure this flows onto on-orchard performance.

Ka Matau Ka Ora is founded on principles of whanaunga (kinship), with an emphasis on growers sharing knowledge and learning from each other. A new set of training modules tailored to Māori growers underpins the project, with a view to boosting the numbers of experienced Māori managers on orchard. This all builds on the success of the previous SFF funded kiwifruit productivity project.

“The industry and related training opportunities has not developed the level of participation nor the number of participants that Māori trusts need to make a difference in our industry,” said Dr Riri Ellis, chair of Tūhono Whenua Horticulture Ltd, set up as a vehicle for a Māori horticultural strategy in kiwifruit and other crops.

The project will develop and roll out a series of co-designed trustees and orchard training/cadetship courses/training with Tūhono Whenua and its industry partners that are accepted and recognised by Māori trusts and orchardists. Between 10-15 trusts

(in separate cluster groups) will participate.

A minimum of 20 trustees will participate in training over three years to achieve a recognised certification in kiwifruit/horticulture governance. And up to 15 management cadets will be recruited into training courses and given orchard placements towards gaining a recognised qualification in the horticultural industry.

“It will create opportunities for Māori women to excel and prosper both on-orchard and as governors. It is likely that many of the trustees will be women, in which case it will be important to find appropriate women to speak to them. This is exciting for Māori trusts moving forward.”

This project offers a unique opportunity for Māori trusts to secure the future development of skills and hands-on experience at both orchard and boardroom level. Importantly, it also allows Māori to retain their rangatiratanga.

1000th project

“This project will be the first of its kind and has wide industry support and the backing of industry leaders. Importantly it also has a specific focus on recruiting women.” – DR RIRI ELLIS



The Murray Whanau Trust, Matakana Island. Photos: Jamie Troughton/Dscribe Media.



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