New Year Honours for industry stalwart Don McLaren

Don McLaren, a Companion of the New Zealand Order of Merit in the 2014 New Year honours’ list, has been a longtime supporter of the horse industry.

Don was previously awarded an ONZM for his services to animal health and the racing industry in 2000.

As the founder and owner of the NZ veterinary pharmaceutical company Bomac Laboratories, which he set up in 1958 and sold to Bayer New Zealand Ltd in 2011, Don has been a generous benefactor to the NZERF. The popular Bomac Lecture Series (now Bayer Lecture Series) was an initiative that Bomac have sponsored since 1987, along with the half yearly NZERF Bulletin.

He also established the $750,000 Don McLaren Fellowship Fund, an investment fund from which dividends will be directed to branches of the NZ Veterinary Association including the NZ Equine Veterinary Association.

Northfields Stud, a boutique thoroughbred stud founded by Don, has bred and/or raced some outstanding young horses.

These funds will be used to support research and to fund continuing education for the country’s equine veterinary surgeons.

In 2002 Don was inducted into the NBR Business Hall Of Fame. He is also a past Chairman and Life Member of the Auckland Racing Club, the Patron of the NZ Racing Hall of Fame and in 2012 became the first non-veterinarian elected as an Honorary Life Member of the NZ Equine Veterinary Association.

NZERF Activities 2014

Over the last 6 months the NZ Equine Research Foundation has:

• Assessed applications and awarded Gillian Davis the Valachi Downs Young Achiever Award
• Assessed applications and awarded Monica Commons and Alex Fowler the 2014 Massey University Veterinary Student NZERF Scholarships
• Finalised approval & funding of 2 Research Grant applications
• Distributed the Spring Bulletin
• Participated in hosting the International Symposium on Equine Reproduction
• Provided on-going financial support for 2 research projects

In the next 6 months the NZ Equine Research Foundation will:

• Consider applications for the Vet/Farrier Scholarships
• Invite & consider applications for Research Grants
• Monitor Research Grants previously awarded
• Plan and host the next Bayer Lecture Series
• Sponsor the Massey Equine Club
• Distribute the Autumn Bulletin
• Finalise the publication of at least one booklet

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ISER XI – The 11th International Symposium on Equine Reproduction

26th – 31st January 2014, University of Waikato, Hamilton New Zealand

Dr Lee Morris, Chairperson of the Local Organising Committee ISER XI

Highlights of the ISER XI conference will be presented in this and the following 2 Bulletins as a series of 3 summaries: I: The stallion, II: The non-pregnant mare, conception and early pregnancy, III: The pregnant mare and perinatology.

BACKGROUND

The First International Symposium on Equine Reproduction (ISER) was held in Cambridge, UK in July 1974 and was initiated by Twink Allen (ex patriot New Zealander) with the support of John Hughes, Doug Mitchell, Bill Pickett and Peter Rossdale. The purpose of the meeting was to provide a forum for biologists and veterinarians interested in equine reproduction to exchange their views, to review the present state of knowledge on the subject, to produce guidelines for future research, and to foster international friendship and collaboration.

The Second International Symposium on Equine Reproduction was held four years later (July 1978) at the University of California, Davis, USA. Eighty-three papers were presented on basic and clinical research in all aspects of equine reproduction. The proceedings of this meeting, appropriately entitled ‘Equine Reproduction II’, were again published as a supplement to the Journal of Reproduction and Fertility and are still quoted in the current literature. A tradition was born. Since 1978, the International Symposium on Equine Reproduction has continued to be organised every four years to coincide with the Chinese Year of the Horse: Sydney, Australia 1982; Calgary, Canada 1986; Deauville, France 1990; Caxambu, Brazil 1994; Ondersteepoort, South Africa 1998; Fort Collins, Colorado USA, 2002; Kerkrade, the Netherlands, 2006 and Lexington, Kentucky USA, 2010.

THE 11TH INTERNATIONAL SYMPOSIUM ON EQUINE REPRODUCTION

Our local organising committee was a collaborative effort between New Zealand and Australia. From NZ: Lee Morris (chairperson), John O’Flaherty (treasurer), Jody Blomfield (secretary), Margaret Evans, Erica Gee and Bruce Taylor. From Australia: Angus McKinnon, Judy Cawdell Smith, John Chopin and John Hyland. The symposium was generously sponsored by: Platinum sponsors - West Coast Equine Reproduction Symposium, Hagyards Equine Medical Institute; Gold Sponsors - Caledonian Holdings, Minitube, Goulburn Valley Equine Hospital; Silver Sponsors - EquiBreed NZ, EquiLume, Fiber-Fresh, NZ Equine Veterinary Association; Bronze sponsors - Bioniche, BotuPharma, Matamata Veterinary Services, Newmarket Equine Hospital, NZ Equine Research Foundation, Rossdales and Partners Equine Hospital; and Grassroot sponsors - Select Breeders Services, Wai-Eyre Farm, Woodlands Stud, Alabar Stud and Nevele R Stud.

The scientific programme was made up of 153 abstracts (81 oral and 72 poster presentations) which had been through a peer review process by the international committee www.iser-online.org. It was an enormous honour for New Zealand to host this prestigious event with 300 delegates attending from all the continents. Our honorary chairman was Professor Keith Betteridge from the University of Guelph, Canada who has been a pioneer of equine embryology for over 40 years. He discovered that only fertilised eggs will move from the horse oviduct into the uterus and he also defined the capsule of the equine embryo. These studies continue to contribute to our understanding of embryonic development and pregnancy loss in the mare. The John Hughes Memorial lecture was presented by Professor John Aitken from the University of Newcastle, Australia. He eloquently described how sperm are vulnerable to oxidative damage because they contain an abundance of polyunsaturated fatty acids in the membranes. He examined the effect of oxidative stress on fertility and described new approaches to management of this problem.

New Zealand was represented scientifically with papers presented by Jody Blomfield (EquiBreed NZ), Erica Gee (Massey University), Nikita Stowers (Fiber-Fresh) and Sarah Vincent (Endolab, Christchurch Hospital). The winner of the Michelle le Blanc prize for the best presentation was Dr Zamira Gibb from the University of Newcastle, Australia, for her presentation on minimising DNA damage in stallion sperm. Zamira recently completed her PhD in sex-sorted stallion semen at the University of Sydney in collaboration with EquiBreed NZ. It was with sadness that our New Zealand great, Professor Cliff Irvine, was not able to attend this ISER due to his passing in 2010. Prof. Irvine was a regular contributor to equine reproduction and to ISER and he was remembered in his obituary, provided by Margaret Evans, in the scientific proceedings for his contribution to our current understanding of hormonal changes in the mare’s reproductive cycle.

PART 1: THE STALLION

Spermatogenesis and testicular function

Studies from the USA described the complex genetics of cryptorchidism that affects up to 8% of colts born. The Belgians also showed that using staples to castrate colts with large inguinal rings was successful. The effects of stress
on stallions were studied in the USA using a corticosteroid treatment model which reveals the long term effects of stress on spermatogenesis and sperm quality. Doppler ultrasound was also found to be useful in investigating severe testicular dysfunction.

**Breeding soundness evaluation and prediction of fertility**

Stallion fertility assessment using traditional methods (microscopic evaluation of sperm motility, testicle size and volume, sperm production) result in more stallions passing the breeding soundness examination than when modern technology (computer assisted sperm analysis and DNA analysis) is used. Typically human microscopic interpretation of sperm motility is higher than computer analysis of the same parameter. Total motility was found to be more predictive of fertility than progressive motility. New metabolic assays are being evaluated in Australia to provide on farm tests of fertility for Thoroughbreds. DNA fragmentation is proving a useful test for sperm function in studies in Australia, Brazil, Switzerland and Holland. Antisperm antibodies are also associated with lower fertility.

For stallions that accumulate sperm it can take up to 7 days and 9 ejaculates to produce good quality sperm. These stallions need to be on a regular ejaculation schedule. When stallions are on a regular ejaculation schedule all year round, there is no seasonal variation in the DNA quality of their sperm. Polish scientists showed that as stallions age there is an increase in sex chromosome aberrations which can be effectively diagnosed using fluorescence in situ hybridisation (FISH) analysis.

**Semen quality for cooling and freezing**

In Kentucky, USA they showed that to optimise the quality of semen for cooling and freezing, the number of stallion mounts per collection should be minimised. Studies in Belgium showed how optimising sperm concentrations for shipping and freezing are important to minimise anaerobic metabolism and reduce the detrimental effects of excess lactate production. The Brazilians have been concentrating on new semen extenders and their effect on sperm quality and found that milk is still required to optimise sperm quality after cooling. Egg yolk remains an important ingredient in semen freezing extenders, despite attempts to replace it with coconut water (Australia) or low density lipoproteins (USA). Soy lecithin (China), antioxidants (Australia, Brazil) and large molecular weight sugars (Germany) are showing promise as new ingredients in semen extenders. However, the Brazilians showed that the addition of motility stimulants to semen from subfertile stallions was not beneficial to fertility parameters.

Regardless of extender and shipping temperature (4 or 15°C), the Spaniards showed that the best pregnancy rates are obtained when mares are inseminated within 12h of ovulation with chilled semen. Efforts in Italy, Sweden and USA to select viable sperm using single layer density gradient centrifugation improve sperm quality but not fertility or freezability for subfertile stallions. Epididymal sperm is proving an interesting model for subfertile stallions and the effects of seminal plasma on fertility in Brazil.

**Nutritional supplementation of stallions**

New Zealand studies illustrated how anti-oxidant dietary supplementation of stallions with canola oil alone significantly improved sperm longevity and pregnancy rates when compared with supplementation of Vitamin E and Se alone. Furthermore, inclusion of HNF Fiber in the diet reduced the incidence of defects in the sperm tail and midpiece after freezing and thawing.

**Sperm transport in the mare**

Interesting work in the USA describes how some uterine treatments can have a deleterious effect on the motility of sperm in the uterus. Furthermore, there are important factors in the stallion seminal plasma that increases the binding of dead sperm to neutrophils in the mare’s uterus and other proteins that prevent the neutrophils binding to the live sperm. This enhances the ability of the mare to evacuate dead sperm from her reproductive tract while facilitating the selection of the remaining live sperm for their journey to the site of fertilisation.

**FOALING MANAGER AWARDED VALACHI DOWNS STUD YOUNG ACHIEVER SCHOLARSHIP**

Gillian Davis (28) has been awarded the Valachi Downs Stud Young Achiever Scholarship for 2013. Gillian is currently employed as the Foaling Manager at The Oaks Stud in Cambridge. She previously worked at Ballylinch Stud in Kilkenny, Ireland, before coming to New Zealand three years ago.

Gillian is using the scholarship to travel to Kentucky in the USA to further her knowledge of the management and treatment of pregnant mares, foaling and caring for new-born foals, and will be working closely with leading specialists in reproduction on stud farms foaling large numbers of mares. Gillian has a particular interest in placentitis and its effects on mares and foals and is keen to further her knowledge on this subject. She will also spend time with specialists in reproduction and medicine at the Rood and Riddle Equine Hospital.

Gillian will be returning to New Zealand in time for this year’s spring foaling season.

NZERF is very appreciative of the financial support provided by Kevin Hickman and Valachi Downs Stud which ensures this important opportunity is available to our young people.
Comparing Equine Stem Cells sourced from bone marrow, fat and blood

Amy Redmond Hubbard¹, Mônica Senna Salerno², Ray Cursons³ and Lee Morris¹
¹EquiBreed NZ Ltd, 399 Parklands Rd, RD 1, Te Awamutu. ²AgResearch Ltd, Ruakura Rd, Hamilton. ³The University of Waikato, Hamilton

BACKGROUND
Musculoskeletal injuries are a major contributor to wastage in the equine racing industry. While the horse is unable to race its earning potential is lost and the costs of rehabilitation are high. The rehabilitation period incurs an array of costs such as stabling, spelling, veterinary and feeding expenses. An Australian study of wastage in 2 year old thoroughbreds reported a loss of 66% of days in training due to musculoskeletal injuries. In the UK a review by Paris and Stout (2010) determined that 15-25% of horses requiring spelling from training had joint problems while tendon and ligament injuries accounted for 46% of horses requiring spelling. Following treatment or rest from training the incidence of re-injury once the horse returns to training is also high. A case-controlled study of 400 horses in the UK revealed that the re-injury rate of tendon and ligament injury was 53% (O’Meara et al, 2010). Any treatment which is able to reduce the incidence of injury, time to recovery and level of re-injury reduces this wastage as well as costs incurred to the industry (Seitzinger et al. 2000).

NEW TREATMENT OPTIONS
The use of regenerative cell therapies has been suggested as an alternative to current medical treatments which struggle to restore the tissue to its original form. Mesenchymal stem cells (MSCs) in the horse can be derived from fat, bone marrow or blood and it is thought that inclusion of stem cells in the treatment regime will facilitate the healing of injured tissue and help restore it to its original form. Currently, MSC treatments are autologous, meaning that the cells originate from the patient itself. Typically MSCs are used either fresh or after a period of culture and differentiation. Different laboratories around the world have investigated different sources of stem cells but no comparative study has been done to determine the best tissue source for treatment of horses with MSCs. Commercial kits using fat tissue as a source of stem cells are available in NZ. However, it may be that different sources of MSC will suit different types of musculoskeletal injuries.

![Fig. 1: (Left – right) Drs Barney Fraser, David Howes and Charlotte Cantley collaborating with Amy Redmond Hubbard at EquiBreed NZ for stem cell project.](image)

STEM CELL STUDY IN NEW ZEALAND
This study was generously funded by the New Zealand Equine Research Foundation and represents a collaboration between EquiBreed NZ Ltd, AgResearch Ltd, The University of Waikato and the equine surgeons from Cambridge Equine Hospital, Hamilton Veterinary Services, Marks-Ewen & Associates Equine Hospital and Shof International Ltd (Fig. 1).

Preliminary studies using post mortem samples of fat, bone marrow and blood facilitated the establishment and refinement of MSC processing and freezing protocols under New Zealand conditions.

For the “in vivo” phase of the study, equine fat, bone marrow and peripheral blood from six different horses were compared as sources of MSCs. Specific stem cell characteristics were investigated to confirm whether the three tissue sources do indeed yield stem cells and whether we could determine an optimal source of MSCs under laboratory conditions. The stem cell characteristics that were evaluated included the ability of the cells to adhere to a culture vessel surface, multiply in culture and differentiate into three tissue types (fat, cartilage and bone). The cells from all three tissue sources were also frozen in liquid nitrogen to investigate the viability of the cells after long term storage.

All three tissue sources yielded stem cells capable of adherence and multiplication in culture; however, fat and bone marrow provided better quality and higher numbers of MSCs than peripheral blood. The growth and development phase of the project used MSCs from fat and bone marrow samples which were then transformed into fat, cartilage and bone cell lines and this transformation was confirmed by histological evaluation of the structures under the microscope. We found that bone marrow-derived stem cells differentiated into cartilage cells better than fat-derived stem cells. The ability to differentiate into fat cells was superior in fat-derived stem cells, while the ability to differentiate into bone was similar for both fat- and bone marrow-derived stem cells. Stem cells were isolated from the peripheral blood but they did not perform well in culture.


PCR analysis was used as a second test to confirm the expression of genes for each tissue type. It was found that bone marrow-derived stem cells expressed bone and cartilage genes better than fat-derived stem cells.

Each source of stem cells (fat, bone marrow and blood) had different advantages and disadvantages. Peripheral blood is a poor source of stem cells using the currently published protocols. Fat is an abundant source of stem cells but requires extended handling in the laboratory that increases its risk of contamination.

Bone marrow can be collected safely and performs as well as fat in culture. The superior ability of bone marrow-derived stem cells to differentiate into cartilage is of clinical relevance, as joint injury is a leading cause of wastage in horses.

Overall, this study found that bone marrow-derived stem cells appear to be a superior source of equine MSCs under laboratory conditions. Although fat was found to be an abundant source of MSCs, this cell source displayed poor development into cartilage cells. Further investigation of the performance of MSCs in the live horse is now required to determine which source of MSCs offers the best therapeutic benefit for injuries in horses.

The authors would like to thank the NZERF and EquiBreed NZ for funding this project and the equine surgeons from Cambridge Equine Hospital, Marks-Ewen & Associates Equine Hospital, and Hamilton Veterinary Services and ShooF Ltd for their collaboration.

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**Efficacy of Strangles Vaccines in New Zealand Horses**

**Ray Cursons, PhD. Senior Lecturer, University of Waikato**

The disease Strangles is caused by the equine-restricted pathogen *Streptococcus equi* subspecies *equi* (*S. equi*). This highly contagious disease accounts for approximately 30% of recorded incidents of equine disease annually and is characterized by abscessation of the lymph nodes of the head and neck. The severity of this disease varies greatly depending on the immune status (resistance to disease) of the affected animal. Currently there are two vaccines for the prevention of strangles available in New Zealand. One is a live vaccine consisting of a non-encapsulated and attenuated (weakened) strain of *S. equi*, Pinnacle® IN (Ford Dodge, USA), which is administered intranasally. The second is an inactivated vaccine, Equivac® S (Pfizer, NZ), which is administered intramuscularly. However, the efficacy of these two vaccines against the two *S. equi* strains (99 and 100) that are present in New Zealand is unknown.

In this study a serological test (the detection of antibodies in serum) called the indirect fluorescent-antibody assay (IFA) was developed to detect specific antibodies in sera from horses either infected with *S. equi*, or vaccinated with either Pinnacle or Equivac S. The IFA results showed a difference in antibody titre (antibody levels) between pre-vaccinated horses and post-vaccinated horses. The IFA results also showed that the observed antibody levels induced by Pinnacle or Equivac S following vaccination were similar, indicating the efficacy of these two vaccines in inducing specific antibodies was comparable. Furthermore, all of the vaccinated-horses were shown to maintain high levels of pre-existing antibodies within their sera, even one year after vaccination. So while there was a four fold increase in antibody titre in horses after the first set of vaccinations, there was little observed increase in antibody titre in those fully vaccinated horses receiving their annual booster vaccination. Western blotting (another serological test that uses soluble peptides from the bacteria) results indicated that a stronger antibody response was formed in horses following a natural infection with *Streptococcus equi* as compared to vaccinated horses.

The conclusion of the study was that the vaccines available in New Zealand were shown to be effective in protecting horses against strangles.

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**2014 BAYER LECTURE SERIES**

This year’s lectures bring together some of New Zealand’s best equine researchers who will present their very latest findings on a range of exciting topics of particular relevance to NZ horse owners.

Dr Lee Morris, registered veterinary specialist in reproduction at Equibreed, Waikato, will speak on “Stem cells – how to turn fat into bone” and “New treatments for lameness on the horizon – snake oil or science?”. Dr Ray Cursons, senior lecturer in molecular genetics at University of Waikato, will speak on “What’s new in strangles – the disease that won’t go away”, an update on strangles in the NZ horse population and the vaccines available to prevent the disease. Dr Michelle Logan, Veterinarian from Alexandra, will speak about her recent research on “Equine Metabolic Syndrome – is your horse at risk and how can we tell”.

**THE BAYER LECTURES WILL BE PRESENTED AT 4 VENUES:**

- **Saturday, 26 July** Riccarton Racecourse, Christchurch
- **Tuesday, 29 July** Awapuni Racecourse, Palmerston North
- **Saturday, 2 August** Karaka Sales Centre, Auckland
- **Sunday, 3 August** Matamata Club, Waikato

Registration will be from 1.00pm Lectures start at 1.30pm and ending at 5.00pm
PROFESSOR CLIFF IRVINE SCHOLARSHIP WINNER – OLIVIA PATTY

The inaugural Professor Cliff Irvine Scholarship recipient is Ms Olivia Patty, from the University of Waikato. Olivia, originally from British Columbia, Canada, now lives in New Zealand with her husband and family and has recently completed a Masters degree supervised by Dr Ray Cursons on a NZ Equine Research Foundation funded project using molecular techniques to diagnose and sequence *Streptococcus equi* subsp. *equi*, the bacterium causing strangles. Shortly after completing this project Olivia was invited to present her findings at the world renowned Havemeyer Workshop in Lexington, Kentucky. Olivia will shortly commence her PhD studies on the bacterial agents causing respiratory disease in horses. As part of her NZERF funding for the project, Olivia has been awarded the Professor Irvine Memorial Scholarship. This Scholarship was established to recognize the contribution that Professor Cliff Irvine (Lincoln University) made to veterinary science, equine endocrinology and to the NZERF over his long and distinguished professional life. Our congratulations go out to Olivia for being awarded this prestigious scholarship.

Evaluation of a local treatment method for Strangles infection – a pilot study

Dr Anna Kendall, Massey University

Strangles is an infectious disease of horses caused by the bacterium *Streptococcus equi*. It is one of the few potentially serious infectious diseases that occurs in horses in New Zealand. Horses of all ages are susceptible, and the disease manifests as purulent infection and abscess formation in the retropharyngeal lymph nodes and guttural pouches. This can lead to a high fever and purulent nasal discharge, as well as airway obstruction and problems swallowing during the acute stage of disease (hence the name “strangles”). Although most horses that recover from the disease develop good and long lasting immunity, some become chronic carriers, harbouring the bacteria in the guttural pouches without displaying any clinical signs. These individuals most likely play an important role for maintaining and spreading the disease in the equine population.

For medical management of streptococcal infections, penicillin is the most effective antimicrobial drug. Penicillin is given by intramuscular injection, and having to perform repeated injections can be difficult in some horses and may steer the choice of antimicrobial to a less effective or less appropriate drug that can be given orally. Also, with any systemic treatment the penetration of drug into abscesses may be poor. Local treatment, where the penicillin is delivered directly into the guttural pouch, is an appealing alternative as it could decrease the need for long-term intramuscular injections of penicillin and may also enhance the local concentration of penicillin, thereby increasing the efficacy of the drug. Local treatment has also been suggested to be effective for horses that are chronic carriers of *Streptococcus equi*. The current recommendation is to mix up a gelatine paste containing penicillin and to deposit this mixture into the guttural pouches. Unfortunately, controlled studies on the efficacy of this treatment are lacking. Gelatine is used in order to retain the penicillin within the guttural pouch, as liquid formulations will not stay in the intended location for very long. However, even if the cold gelatine is solid when deposited in the pouch, the normal body temperature of the horse (37-38°C) will revert the paste back into liquid form. It is unknown if a sufficient amount of active substance is absorbed into the surrounding tissues to have the desired therapeutic effect before it drains out of the pouch. If not, an alternative treatment option should be sought in order to improve treatment outcomes and minimise inefficient and unnecessary use of antibiotics.

The NZ Equine Research Foundation has funded a pilot study that will look at tissue levels of penicillin in the guttural pouches of horses after local treatment. Horses will be treated with either the penicillin/gelatine formulation or with intramammary penicillin originally formulated to treat mastitis in cows. The horses will be observed to investigate if the drug is seen to drain out through the nostrils, and tissue levels will be examined after 12-24 hours in order to see if therapeutic effect before it drains out of the pouch. If not, an alternative treatment option should be sought in order to improve treatment outcomes and minimise inefficient and unnecessary use of antibiotics.

If you would like to know more about this project, please contact Anna Kendall; a.t.kendall@massey.ac.nz

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**Evaluation of a local treatment method for Strangles infection – a pilot study**

*Dr Anna Kendall, Massey University*

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If you would like to know more about this project, please contact Anna Kendall; a.t.kendall@massey.ac.nz
2014 Massey Student Scholarship winners

The NZERF Massey Scholarships of $5,000 each for final year Veterinary Students in 2014 have been awarded to Monica Commons and Alexander Fowler.

Monica Commons

Monica has a background in show jumping and has competed throughout New Zealand and in Canada. She is also involved in an equestrian livery and training establishment with her family at Waimauku. As part of her final year Monica is planning to return to the US to complete externships in North Carolina, Kentucky and Florida. After completing her BVSc degree she is aiming to undertake an equine medicine internship.

Alex Fowler

Alex initially expected to become a sheep veterinarian, having spent time on a high country station in the South Island. However, after experiencing equine veterinary work his passion to work with horses came to the fore. Eventually Alex intends to pursue a pathway to specialization in either equine medicine or surgery. Earlier this year he took part in externships at both Pioneer Equine Hospital, California and Rood & Riddle Equine Hospital, Kentucky and hopes to apply for an internship in 2015.

Chairperson’s Corner

We are fortunate to have a number of excellent equine research groups in New Zealand, and this issue of the Bulletin includes reports from two of these on their just completed NZERF-funded projects. We may be physically distanced from much of the world but this not does prevent New Zealand from producing research results of significant benefit to horses here and overseas, results which contribute to the body of science worldwide. Indeed at the 11th International Symposium on Equine Reproduction held this year in Hamilton, there were 4 presentations from NZ groups, one of which was funded by the NZ Equine Research Foundation, and another a collaboration between researchers in NZ and Brazil that was also supported by the NZERF.

With this in mind, the 2014 Bayer Lecture series has been designed to bring you findings from some of the latest research being performed in New Zealand. This is exciting work, all of it very topical and relating to horses in NZ, and should be of great benefit to anyone involved in the horse industry. Please check the date that the lectures will be in your area and send in your registrations!

Congratulations to the recipients of various awards announced in this issue of the Bulletin. The future of the equine industry in New Zealand is in good hands if the calibre of these young people is anything to go by.

If you wish to find out more about the activities of the NZ Equine Research Foundation, please visit our website on www.nzerf.co.nz, or contact one of the Board members listed on the back page of this Bulletin.

Dr Margaret J Evans
NZERF Chairman
Acknowledgements

The New Zealand Equine Research Foundation gratefully acknowledges the following organisations who gratuitously distribute the 15,000 Bulletins we produce for horsemen and women throughout the New Zealand Horse Industry.

The NZ Thoroughbred Breeders' Association (Newsletter)
NZ Thoroughbred Racing (NZTR Thoroughbred Racing Monthly)
Harness Racing New Zealand (Harness Racing Weekly)
The NZ Standardbred Breeders' Association (Newsletter)
Equestrian Sport New Zealand (ESNZ Bulletin)
The NZ Equine Veterinary Association (Equine Veterinary Practitioner)
NZ Farriers Association (Inc) (N.Z.F.A. Newsletter)
NZ Thoroughbred Owners Federation (Bulletin)
Taranaki Miniature Horses (Newsletter)
The Morgan Horse Association of NZ Inc. (Newsletter)
NZ Hanoverian Society (Inc.) (Newsletter)