Chapter 9

Some significant people of the department

Perhaps this was the hardest chapter to write. While many of the officers listed present themselves as automatic entries, others, to a degree, are representatives of a wider group of officers, all of whom were vital cogs in the organisation.

Some 50 people are listed for their special contribution to the Department of Agriculture and the agricultural industries. The list is not in any way exhaustive because a large organisation like the department works through the efforts of many people. They are the administrative staff at all levels, the support staff of technicians, field and laboratory assistants, the inspectors, the instructors and others.

A selection of professional staff

Only a small selection of the staff has been included yet those not included were or are also important people. The chapter aims to both record the work of those included and to record the quality of the staff of the department over many years.

Lancelot Lindley-Cowen

Lancelot Lindley-Cowen was born in Virginia, USA, and arrived in WA in 1889 at age 31. When the Bureau of Agriculture was formed he was appointed as Secretary. He had been an officer in the US Navy, serving on the USS Enterprise on the China Station. After arriving in Australia he ran a newspaper and wrote on agricultural matters for the Melbourne Leader. On arriving in WA he took up a position as manager of Palinup Station east of Broomehill.

He became connected to the WA Land Company and for some time produced the Albany Observer newspaper. He then worked as a travelling commissioner with interests in vine and fruit growing and agriculture generally. He travelled extensively in the South West, giving lectures on the industry and forming vine and fruit growers’ associations. He contributed a series of articles to The West Australian on fruit and vine growing and dairying. He also wrote humorous literature for the paper under a nom de plume.

As Secretary of the bureau he established the Journal of Agriculture immediately after its formation. This was the vehicle for presentation of existing knowledge on all aspects of agriculture. With his journalistic background he was doubtless a major player in the publication and the success of the Journal. The bureau was also very active in obtaining and implementing legislation for the prevention of entry and the eradication of insects and weeds.

He sought its creation as an independent department but lost this battle and from 1898 to 1903 the department was a division of the
Lands Department. He was also one of the proprietors of the Santa Rosa Vineyard near Guildford. He died suddenly in March 1902 at the age of 44.

**Alexander Crawford**

Alexander Crawford was born in Belfast in 1857. He was educated at Queen’s College and at the Albert Agricultural College in Dublin. He came to Australia, possibly visiting Queensland but later prospecting for gold, surveying possible routes through WA for a transcontinental railway and for a time managing a butter factory at Ballan, Victoria. In 1881 he became part-owner of a sheep run inland from Geraldton but poor prospects made him go to Perth in 1882. He returned to Victoria where he married his cousin Eliza Jane Mathews in 1885. He extended a trip home to Ireland to visit the dairy districts of Sweden, Norway and Denmark. He then travelled to the USA spending almost a year visiting agricultural colleges.

With this background he took a position as a travelling dairy adviser in Victoria in 1888. Over the next two or three years he travelled widely in Victoria giving lectures and practical demonstrations on butter and cheese production. In 1891 he took a position as manager of the Victorian Creamery and Butter Company. This company failed in 1895 but Crawford had come to WA before then.

In 1896 he joined the Bureau of Agriculture as a dairy consultant. He continued in that position until 1902 when he was promoted to the position of Land Officer for the Victoria District (Geraldton). Shortly after his appointment he conducted members of the Agricultural Advisory Board on a tour through the land districts near Geraldton. Their duty was to report on the agricultural possibilities and to advise the Agricultural Bank whether it would be justified in advancing money on properties in the district. Their report was decidedly condemnatory, a view with which Crawford did not agree. As outlined in Chapter 8, he was instrumental in having Chapman Research Station established and was its first manager, where he proved the board’s report to be wrong.

He became Acting Director of the Department of Agriculture in 1903 and Acting Under Secretary in 1905. Meantime in 1905 he was subject to investigation by a Royal Commission looking into the failure of the Victorian Butter Company. This may have affected his career although no charges were laid. He took charge of the Rabbit Branch in March 1908 and continued in that role until 1920.

Crawford became a Councillor of the Royal Agricultural Society in 1909 and President in 1916.

**George Lowe Sutton**

George Sutton was born in Liverpool, England, in October 1872. His father died when he was only six months old. His mother migrated to New South Wales with George in 1882. Sutton attended Sydney’s Fort Street School. After leaving school he worked on a dairy farm with his uncle near Liverpool on the outskirts of Sydney. He attended Sydney Technical College and was awarded a Diploma of Agriculture with first class honours. He was appointed experimentalist and lecturer at Hawkesbury Agricultural College in 1900. There he met William Farrer and cared for Farrer’s wheat breeding plots. In 1905 he was appointed to manage and open the Cowra experiment farm for the NSW Department of Agriculture. His tasks included looking after Farrer’s wheat breeding plots. When Farrer died in 1906 Sutton was appointed experimentalist in charge of wheat breeding and manager of the Cowra and Coolabah government farms. In 1911 he was appointed Commissioner for the Wheat Belt by the WA Minister for Agriculture, Mr (later Sir) James Mitchell. He shared Mitchell’s desire for development to “settle landless people on a peopleless land”. He was responsible for changing the role of the ‘state farms’ from being demonstration farms for current best practice to being primarily experimental and plant breeding farms with no aspirations to be the
best farms in their districts. He showed great energy and considerable vision and in mid-1921 was appointed Director of the Department of Agriculture.

Sutton set out to develop the department as a professional organisation providing research and information services to the farming community. He immediately looked to employ graduates from the University of WA and in his first year he was able to employ two young graduates, then two more in his second year. However, he realised that direct action would be necessary if he was to obtain the professional staff he wanted. He introduced a cadetship scheme where young men could be trained while working during their vacations in the department. In 1922 he appointed six cadets who later became departmental officers and this carried on through the 1920s with two to four cadets being appointed on an annual basis. He also employed young veterinarians who had been trained in eastern states universities. Two of the early appointments were Bill Bennetts and Claude Toop.

Sutton’s vision was for the department to be an organisation which worked closely with the farming community, extending to it the latest information and being made aware of its problems. He saw knowledge of its problems as the driving force behind the department’s research and demonstration program. He retired in 1937.

In his 16 years as Director he had changed the department into a highly professional organisation on which his successors were able to build. He left a legacy of professionalism which has been the basis of its operation ever since. He was one of the early inductees into the Royal Agricultural Society’s Hall of Fame.

George Kingston Baron Hay MC

George Baron Hay was born in Kingston, Jamaica, educated in England and arrived at Albany at age 18. He joined the Narrogin Farm School. In 1915 he was one of only two students enrolled in the Faculty of Agriculture at the University of WA. That year he joined the 51st Battalion AIF. He gained commissioned rank and was awarded the Military Cross in France in 1917. He was demobilised with the rank of lieutenant. He resumed his studies and graduated with a BSc in Agriculture in 1922 and was one of the first two agricultural graduates appointed by Sutton in 1922.

He worked as an adviser for seven years, initially in the wheatbelt and then in dairying areas. He was appointed as Superintendent of Dairying when Hampshire retired in 1931. He followed L StJ Jones as Under Secretary of the Department of Agriculture in 1941. He was seconded to the position of Chairman of the War Service Land Settlement Board in 1948, returning to the position of Director of Agriculture in 1951. He oversaw the department’s contribution to the war effort and after World War II managed the settlement of many returned soldiers onto properties.

After rejoining the department in 1951 and recognising the importance of agriculture to the State, he developed the department from a small organisation of limited resources into a potentially major applied research and extension agency. The period from 1951 to 1961 was one of major expansion, increasing professionalism and capacity to
contribute to the developing agriculture of the State. He also encouraged the farming community and marketers to work together for the promotion of research and orderly marketing. As part of this service he revived the cadetship scheme which saw the training of the cadre of officers who made the department such an effective organisation after the late 1950s. Two subsequent Directors of the department, Mike Carroll and Graeme Robertson, were products of that scheme. Baron Hay retired in 1961 and is remembered by Baron-Hay Court, the site of the current head office.

**Thomas Charles (Tom) Dunne**

Tom Dunne was an outstanding student and a good sportsman. He joined the department in 1922 as a cadet and was appointed an adviser in the Wheat Branch in 1926. Later that year he was awarded a scholarship to study at the University of California, Berkeley. He remained there to the end of 1930. During that time he studied plant physiology, plant nutrition and plant pathology. At the end of the four years he was awarded an MSc degree and a PhD for his research into the control of acidity in plants. This was a watershed paper in the thinking about the way plants controlled their internal acidity. On his return he was appointed as Government Agrostologist and seconded to work for the Merchant’s Agricultural Research Fund at Muresk College. He published numerous papers including the 1934 paper co-authored by Leo Shier entitled *A Modified Rotation for the Wheat Belt*. This was the first recommendation for what became known as ‘ley’ farming.

In 1937 he was appointed horticultural research officer and subsequently acted as technical adviser on fruit and vegetable dehydration. As a result of this work he was appointed as an Honorary Food Technologist for the Commonwealth Department of Commerce and Agriculture. This was part of the emergency arrangements associated with World War II. As part of his horticultural research he identified ‘wither tip’ of apples as being due to copper deficiency.

In 1947 he was appointed Officer-in-Charge of the Plant Nutrition Branch, which later became the Plant Research Division. This period saw him working on a wide range of nutrition problems across an equally wide range of species.

As Plant Nutrition Officer Dunne focused on the issues of light land development and, with Shier, made a major contribution. As his role widened he took a strong personal interest in the Ord River development. He recognised it was important to provide a viable broadscale cropping system if the area was to be developed successfully, and chose cotton as the crop.

He developed the Plant Nutrition Branch by recruiting qualified staff with good academic records. When he was appointed Deputy Director of Agriculture (1956) and Director (1960) he applied the same standards across the department during a major period of expansion. He retired in 1971, leaving a much larger and highly professional department to his successors.
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**Edgar Noel (Noel) Fitzpatrick AM**

Noel Fitzpatrick was born in 1929 and educated at Northam High School and the University of WA. He graduated with a BSc(Agric) in 1951 and completed an external MSc(Agric) in 1958. He joined the Plant Nutrition Branch and was given responsibility for research on the nutritional problems of pastures in the higher rainfall districts.

In his first 12 years of service he worked on the nutrition of established pastures, the nutrition and establishment problems of legumes being established on previously uncleared areas, and later the interaction of stocking rates and nutrition in an area stretching east as far as Esperance. In 1963 he was appointed as the first Scientific Liaison Officer and in 1968 returned to the Plant Research Division as its chief. In 1969 he was appointed Deputy Director and in 1971 Director of the Department of Agriculture. He was seconded in 1984 to the Commonwealth Government as Deputy Secretary of the Department of Primary Industry. He subsequently resigned from the Public Service in 1985. In 1988 he was appointed first President of the Murray-Darling Basin Commission, a position from which he retired in 1994.

In his first 12 years in the department he demonstrated the extensive potassium deficiency of older pastures in the higher rainfall areas. He also identified the importance of molybdenum on some soils in the South West and Great Southern. Work was also carried out on identifying suitable Rhizobia for lucerne establishment on sandy-surfaced soils, on the management of lucerne under grazing, the relative value of a range of perennial pasture grasses and the complexity of the relationship between stocking rate and nutrition.

In almost 13 years as Director of Agriculture he oversaw the revision of the legislation controlling the dairy industry and the Soil Conservation Service, the amalgamation of a range of statutory marketing legislation controlling crops and seeds into a single Act, the establishment of the independent Rural Adjustment Commission and the statutory control of lamb marketing. He also initiated the regionalisation of the department. In 1976 he was awarded the Australian Institute of Agricultural Science Medal. After retirement in 1994 he was awarded the 1995 Farrer Medal for contributions to agriculture. He was inducted into the Royal Agricultural Society Hall of Fame in 2007.

**Norman James Halse AM**

Norm Halse was born in 1929 and educated at Wesley College and the University of WA. He graduated with a BSc(Agric) in 1951 and completed an external MSc(Agric) in 1958. He joined the Plant Nutrition Branch in late 1950 and was given responsibility for research in the horticultural industries.

He worked on the nutrition of fruit trees in the early years and on the problems of the tobacco industry. Glasshouse work showed the detrimental effect of chloride level on burn time of the tobacco leaf and field studies proved that chloride levels in the WA environment made it impossible to reduce the chloride levels. Subsequently the buyers for the manufacturers decided not to purchase WA leaf and the industry collapsed.

He was highly regarded as a scientist. As the branch/division expanded he became the senior adviser and consultant to a raft of young officers who were joining the department in the late 1950s and through the 1960s. In this role he insisted on scientific rigour in research. During the 1960s he carried out valuable work in cereal crop physiology, which provided guidance for the plant breeding program and to agronomists, showing that early planting could be the path to higher yields.

In 1970 he was appointed Chief of the Plant Research Division and for the next 13 years guided the young staff in making it a top class research organisation. In 1983 he was appointed Deputy Director. He spent little time in this position, being seconded to the Premier’s Task Force on Land Resource
Management. This reflected his long-term interest in the environment. He was appointed Director General in 1984 and retired in 1990.

Through the 1970s the department’s contacts and involvement overseas increased substantially. There was active involvement in Libya, Nigeria, Iraq and Thailand. In all these projects he was the leader of the feasibility mission, program leader or both. He had an active involvement with the international agricultural research institutes in various countries. He was a member of the external program review committee of the International Centre for Agricultural Research in Dry Areas (ICARDA) for eight years and a member of its board of trustees. Subsequently, he was a member and the chairman of two external reviews of the International Livestock Centre for Africa (ILKA). He was also a member of scientific committees fostering cooperation with the USSR and China. One of the early post-war graduates, he had a major impact on the development of agriculture and the department over 39 years.

_Michael David (Mike) Carroll_

Mike Carroll was appointed to the department as a cadet in 1954 and completed his BSc(Agric) at the University of WA in 1958. He was appointed to the Plant Research Division as a research officer to study plant suitability, establishment and nutrition in the medium to low rainfall areas. In 1963 he returned to the university, where he studied zinc nutrition of plants.

On completion of his PhD he returned to the department and continued in the Plant Research Division. In 1977 he was seconded to the Premier’s Department as Executive Officer of the new Rural and Allied Industries Council. This was set up to help the development of the State’s agriculture beyond the farm gate. The role broadened his perspective of agriculture as an important contributor to the economy. He returned to the department in 1979 and was actively involved in a range of Commonwealth/State policy issues via the Standing Committee on Agriculture, including initiatives to improve interstate research coordination. He was appointed Assistant Director in charge of regional services, then Deputy Director General in 1984. He served as Deputy Director General from 1984 to 1990 and was appointed Director General in 1990. He retired in late 1994.

Like other young graduates in the Plant Research Division in the 1960s Mike Carroll was heavily involved with much of the research and fitting of information to provide the knowledge for sound land development. He was part of a team looking at the basic farming technology for development of the sandy-surfaced soils, including superphosphate responses, trace element requirements, pasture varieties and establishment techniques, rotations etc.

Highlights of his work as a scientific administrator included involvement with the management of the 1969 drought, resolution of the difficulties of the Ord River Scheme and research liaison associated with the growing importance of the funds contributed by industry to the research work of the department.

His contribution to agriculture was recognised by the Australian Institute of Agricultural Science and Technology with a Fellowship of the Institute in 1989. He served as President of both the WA Branch (1972) and the federal body (1986). He was elected as a Fellow of the Academy of Technological Science and Engineering in 1997. At the time of his death he was Chairman of the WA Committee and a member of the Council of the Crawford Fund.

After retirement from the department he continued involvement in agricultural policy, research and management as a program consultant for the Grains Research and Development Corporation (GRDC). He also undertook several reviews of GRDC programs and chaired committees for the Australian Crop Accreditation System (ACAS). This involved working with breeders, agronomists, quality testers,
farmers and others to ensure that ACAS took a consistent approach to providing sound independent information to growers. In these roles his analytical mind and constructive, polite but firm, approach made him an ideal facilitator in resolving the many inter-institutional and interpersonal issues across a range of such programs.

His untimely death, after a lengthy fight with cancer, was a sad loss to Australia’s agricultural industries, particularly the crop industries.

**Graeme Albert Robertson**

Graeme Robertson joined the department as a cadet in 1965, graduating with a BSc (Agric) in 1969. He then won a Rhodes Scholarship for study at Oxford, where he completed his PhD in plant nutrition and MSc in agricultural economics. He returned to the department in late 1974 as an adviser in the Marketing and Economics Branch. During this time he did extensive work on the situation of Ord River farmers following the collapse of the cotton industry and the options for government to provide assistance for that farming community. In 1977 he was appointed Officer-in-Charge of the Kununurra District Office. In this period he changed the attitude of farmers from despair to optimism. His influence was demonstrated by the farmers who, when learning he would be transferred to Perth, offered to pay his salary for two years if he was allowed to stay. This offer was not accepted and in mid-1981 he was transferred to Perth as Commissioner of Soil Conservation and Director of Resource Management. He revitalised the Soil Conservation Service to make it one of the best in Australia. He became a leading influence in the development of policy in resource management in Australia. He was recognised nationally with the McKell Medal in 1993 for “Outstanding Contributions to Soil and Land Conservation in Australia”.

In 1990 he was appointed Assistant Director covering research and research management. At this time he was also appointed Chairperson of the Federal Land and Water Resources Research and Development Corporation—a part-time position held until 1996 in association with his departmental responsibilities.

In March 1991 he was appointed Deputy Director General. He was acting Director General and then Director General with a major initial task of implementing the 1994 Portfolio Review. He was then Chief Executive of the total agency (Agriculture WA) comprising some 1700 staff. He effectively implemented changes required by the government following the review. This included moving the department’s focus to include marketing of products and meeting the requirements of consumers beyond the farm gate as part of its commitment to providing sound advice on production issues to the farming community.

**Ian Geoffrey Longson**

Ian Longson graduated with a BSc (Agric) from the University of WA in 1975 and obtained a Masters Degree in Marketing and Policy from the University of Guelph, Canada, in 1978. After a short period with the department (1978-1981) as an economist he moved via the Premier’s Department, the Asian Development Bank and the Dairy Industry Authority to a private economic consulting firm in 1985. In 1995 he was appointed as Executive Director, Program Coordination within the Department of Agriculture’s executive and was directly involved with the implementation of the Hussey Review. In 1998 he was appointed as Deputy Director General/ Executive Director Policy and Business Services. In this role he developed strategies to reform the WA agricultural statutory marketing boards for grain, eggs and potatoes to address national competition policy compliance. He also developed strategies for the implementation of the government’s policy on gene technology research and the commercial release of modified organisms. He administered the delivery of $27 million of dairy assistance following deregulation of the
industry. He also developed a food quality and safety (SQF) protocol and organised its sale to the Food Marketing Institute in the USA to make it available for international adoption.

He was appointed Director General in 2004. In addition to the normal role of the chief executive he continued the introduction of a market focus and value-adding approach for all products and services provided by the department. He established a food section and developed a multi-agency food strategy. He also initiated the ‘Farm Focus’ project to review and redirect the department’s extension and communication for the farming community. He retired from the department in June 2009.

**Charles Austin Gardner MBE**

Charles Gardner was born in Lancashire in 1896 and came to WA in 1909 with his family who took up farming in the Tammin district. He was a talented artist and won a prize for a flower painting at the Royal Show in 1916. He was appointed to the Forests Department as a botanical collector in 1920 and was a member of a Kimberley Exploration Expedition in 1921. He published details of his observations and collections under the title of *Botanical Notes, North Kimberley Division of Western Australia*. This comprised more than 100 pages, giving detailed descriptions of habitats and plants, including the naming of 20 new species. It was illustrated with photographs and detailed drawings which were a hallmark of his future work. He was appointed to the department as an assistant to the Plant Pathologist and Botanist in 1924.

Although he was not university-trained he already had a substantial knowledge of the plants of WA and a reputation as a collector. By 1927 Gardner had revised the material in the department’s collection. He had also made a collection visit to the eastern Goldfields and discovered a number of plants not previously reported. In 1928 the Botanical Branch was established and a small plant collection was transferred from the Forests Department and joined with the department’s collection. This became the State Herbarium and Gardner was appointed as Government Botanist and Curator. Gardner held this position until his retirement in 1960. In 1930 he published a paper giving a systematic census of the plants of WA describing a number of new plants.

The State Herbarium remained part of the department until it was transferred to the Department of Conservation and Land Management in 1986.

The department’s interest was primarily in economic botany and in his early years he published extensively on weeds and pasture plants. By the end of 1928 he had published over 60 papers on these issues. When he was appointed Government Botanist there was a significant change in the direction of his publications which then focused on the flora of WA. Progressively the economic aspects were left to staff as they joined his group.

Gardner was a committed plant collector, classifier and recorder. He travelled extensively, adding to the collections in the herbarium and producing numerous taxonomic papers. His 1930 paper on a systematic census of WA plants was intended to be a preliminary to a *Flora of WA*. However, except for a chapter on the grasses in 1952 and his joint paper with Bennetts on the poison plants, this did not proceed very far. At the time of his death he...
was working on the genera *Banksia* and *Eucalyptus* but these were left to be completed by others. His series *Eucalypts of Western Australia* published in the *Journal of Agriculture* covered 117 species. These were compiled into a book, *Eucalypts of Western Australia*, by department botanist TEH (Ted) Aplin in 1979.

Over the years he published prolifically in the journals of the Department of Agriculture and of the Royal Society; 320 publications are listed in a bibliography held in the department's library. He developed an encyclopaedic knowledge and made a major contribution to the knowledge of the unique flora of Western Australia. Through vigorous representation he was instrumental in having five major flora reserves proclaimed by the government.

**Harold William (Bill) Bennetts**

Bill Bennetts graduated from the veterinary school at Melbourne University in 1920 having completed Masters and Bachelors degrees. In 1930 he was awarded a doctorate in veterinary science. He then worked with the Commonwealth Government in Cairns during an outbreak of bubonic plague. He lectured and demonstrated in the Department of Pathology at Melbourne University before coming to WA in 1925 as the first veterinary pathologist in the department. In 1947 he was appointed Principal of the Animal Health and Nutrition Laboratory at Nedlands, retiring in 1959. He worked for a short time afterwards as a consultant to the veterinary medicine group, Coopers.

Bennetts was without doubt one of the most illustrious veterinary scientists in Australia's history. He was the principal scientist in the control of enterotoxaemia in 1930, the control of enzootic ataxia in 1937 and the control of 'falling disease' in cattle in 1939. He identified the cause of clover disease and wrote extensively on the toxic plants of WA. Enterotoxaemia, or Beverley disease, was a major problem to the early sheep industry in the Avon Valley. The discovery of the cause and the cure and production of a vaccine to control the disease had a very large impact on animal husbandry throughout the world where sheep grazing was important.

Enzootic ataxia was found to be caused by copper deficiency. This was one of the first records of a trace element deficiency causing an animal health problem in the field. It led to a large amount of experimentation to determine the extent of copper deficiency in WA. This in turn led to the development of the large areas of light land for agriculture.

**Botulism:** Sheep in the medium rainfall areas were affected by botulism due to poor diet causing them to develop depraved appetites and consuming the carcases of rabbits. Feeding trials had shown that the problem was due to a protein deficiency. Investigation by Bennetts and others identified the organism responsible and a vaccine was developed to overcome the immediate problem. The botulism problem was overcome later through the development of higher protein pastures through the planting of subterranean clover and the control of rabbits. Details of this and Bennetts' other work are in Chapter 6.

**Clover disease:** The identification of the cause of this problem by Bennetts and his colleagues focused subsequent research and pasture management and plant breeding which provided the low isoflavone clovers which solved the problem.

These major disease conditions seriously affected sheep farming over wide areas of agricultural land in Western Australia. The research was largely completed by the mid-1940s and made possible the development of a major sheep industry. Despite a lack of resources, Bennetts achieved world recognition. Such was his reputation that while he was at the Hollywood laboratory hardly a week went by without notable scientists from overseas or interstate calling to see him.
Eric Underwood CBE, AO, FRS

Eric Underwood joined the department as a cadet in 1924 and was appointed to the staff on graduation in 1928. He was awarded a scholarship to study at Cambridge University, where he was awarded a PhD in 1931. He rejoined the department and held the position of Animal Nutrition Officer. He resigned in early 1946 to take up appointment as Professor of Agriculture at the University of WA.

Underwood won worldwide recognition for his contribution to the solution of a number of animal nutrition problems, the outstanding one being the demonstration that Denmark wasting disease of young cattle was due to cobalt deficiency. He worked on this problem with veterinarian JF Filmer. Underwood was credited with being the first to demonstrate a field response to cobalt. He also worked on issues such as pregnancy toxaemia and fat lamb production. He was part of the team assembled to determine the cause of ‘clover disease’ in the early 1940s, and subsequently as Professor of Agriculture he supervised a program which saw the solution develop through plant breeding.

As Professor of Agriculture he earned a major international reputation as an animal scientist, particularly through publication of his book *Trace Elements in Human and Animal Nutrition.*

He was the major force in persuading wheat farmers to make a direct financial contribution to agricultural research and persuading the WA Government to match those funds to establish a Soil Fertility Fund. This was subsequently taken up nationally by the wheat industry and the Commonwealth Government to form the Wheat Industry Research Fund. The current Rural Industry Trust Funds grew out of this initiative. These funds have been a huge benefit to all State departments of agriculture.

Underwood’s work was recognised through numerous national and international honours, including Fellowship of the Royal Society. He was one of the first inductees into the Royal Agricultural Society’s Hall of Fame.

Laurence John Hartley (Hartley) Teakle

LJH Teakle was appointed to the department on his university graduation in 1923. In 1924 he took up a scholarship to study at the University of California, Berkeley, and completed his PhD. In 1928 he was appointed as Plant Nutrition Officer in the Department of Agriculture. On the instruction of the Director, he carried out an extensive survey of the forest and mallee soils within the triangle of Salmon Gums, Southern Cross and Lake King. This preliminary survey identified salinity as a potential cause of the problem of an estimated 40 per cent of these soils. He recommended more detailed surveys before further settlement of these areas. This report, coupled with the onset of the Depression, resulted in the area largely between Lake King and Salmon Gums, known as the 3500 farm scheme, never being developed although much of it had been surveyed ready for release. This advice extended to the Lake Brown and Lake King areas which had been settled. As a result of Teakle’s report soils of these areas were surveyed and the farms were reconstructed with some potential farmers losing their properties. This resulted in Teakle being very unpopular with some farmers and he was forbidden by the Director to go back to the area for a period. He continued to oversee this extensive soil surveying program, which was carried out in the early to mid-1930s.

As Plant Nutrition Officer he was also involved in a lot of the early work on phosphate use on various soils. He also took a major part in the early days of the trace element studies which followed on from the demonstration of copper deficiency at Gingin. In 1946 he was appointed the first Commissioner of Soil Conservation. He resigned to take up the position of Professor of Agriculture at Queensland University at the end of 1947. His departure was a big loss.
Clee Francis Howard Jenkins

Clee Jenkins originally joined the Western Australian Museum on graduation with a Bachelor of Arts from the University of WA in 1929. He transferred to the department in 1933 as an assistant entomologist and was appointed as Government Entomologist in 1939. In 1964 he was appointed Chief of the Biological Services Division which contained the Plant Pathology, Entomology, Botany and Weeds and Seeds Branches.

Among his first challenges were the grasshopper problems of the 1930s and early 1940s when plagues were common in the dry years. Swarms developed on the thousands of acres of abandoned cleared country of the eastern wheatbelt. He told of coming to work in the morning in the mid-1930s to be ordered to catch the Kalgoorlie Express that evening to travel to the grasshopper-infested areas so the Minister could say in Parliament that night that he had an officer en route to the area “at this moment”. Outbreaks of codlin moth, oriental fruit moth and sirex wasp were also dealt with effectively under his direction.

He oversaw the development of the Entomology Group from very small beginnings to an effective research and advisory unit. He was responsible for the implementation of the Argentine ant eradication campaign and advising on methods of spreading myxomatosis in WA. He was in charge of the Entomology Branch during the introduction of the new synthetic pesticides, with the benefits and problems these new tools brought to insect control.

He was awarded an Honorary Doctorate of Science in Agriculture in 1995 in recognition of his contributions to the industry and science. One of the sidelines of his period as Chief Entomologist was the continued development of the insect collection which was kept in a room protected by fire prevention equipment based on carbon dioxide flooding in the event of fire. In 1986 the collection held 160 000 insect specimens.

Another sideline was his dedication to native wildlife, a major passion for most of his life. He built on his reputation as a naturalist well after his retirement in 1973.

Clee Jenkins made an outstanding contribution to agriculture and the department over a 40-year career.

Claude Roderick Toop

Claude Toop retired from the position of Chief Veterinary Officer in 1966. He had joined the department in 1926 after two years in private practice, having graduated from the University of Melbourne. He began work on TB problems of dairy herds and was then appointed as the first Government Veterinary Officer stationed in the Kimberley. He worked initially on cattle tick and buffalo fly, and later pleuro-pneumonia. He then spent five years as quarantine officer at Fremantle and for a further 10 years undertook general veterinary work in the south of the State. During this period he became familiar with the disease problems and well-known among farmers.

He became acting Chief Veterinary Officer in 1948 and was confirmed in the position in 1951. In this role he oversaw the development of the departmental veterinary service in the post-war years and also fostered and developed a strong inspection service. The inspection service had the dual role of managing the eradication programs...
and relevant legislation for stock management and managing the border controls which successfully excluded weeds and exotic diseases.

Toop is credited with developing the protocols which contained the buffalo fly and pleuro-pneumonia in the Kimberley. He was involved with the eradication of swine fever in 1942 which was introduced in food for US troops stationed in WA during World War II. It reached the pig herd through swill feeding, which was subsequently banned. He introduced Strain 19 vaccination against brucellosis in dairy cattle and organised the campaign to eradicate TB from dairy herds. This had been almost achieved when the national program started in the State.

In the early 1960s he oversaw the early stages of the national program which finally eliminated TB from all cattle herds in WA. He organised the footrot eradication campaign. This was regarded one of his great successes as he adopted a rigorous quarantine and slaughter campaign which was at first quite unpopular. However, results led to widespread support for the program. While it was not fully successful, it reduced the incidence of chronic footrot from a major to a minor problem. He was also involved with the control of the pullorum disease of poultry when it was introduced.

He is also credited with the introduction of the cadetship scheme to train young men as veterinarians in eastern states universities, before the establishment of a veterinary school in WA. Toop was an outstanding officer who was inducted into the Royal Agricultural Society’s Hall of Fame.

Francis Leonard (Leo) Shier

Leo Shier joined the Public Service as a cadet in 1922. On completion of his Agricultural Science degree he was appointed to Geraldton as an adviser in 1926. During his time there he was involved with the experimental program at Chapman Research Station and carried out active extension and practical research over a wide area of the wheatbelt.

In 1934 he was transferred to Perth as a specialist export lamb market adviser. He was the original State member on the Commonwealth Technical Committee on Fat Lamb Production. In 1941 he was appointed Assistant Superintendent of Wheat Farming and was associated with the major development of what became the Wheat and Sheep Division. His major contributions as Assistant Chief of the division were to develop the agricultural advisory services for the wheat and sheep areas, particularly in the period after World War II, and through his collaboration with TC Dunne on the development of a suitable cropping rotation for the wheatbelt; he was co-author in their 1934 paper A Modified Rotation for the Wheat Belt. He also worked with Dunne on the development of the sandy-surfaced soils for agriculture from 1950 to 1956; particularly through Wongan Hills and Esperance research stations.

In 1953 he was appointed Chief of the Wheat and Sheep Division and continued the development of advisory services. In 1955-56 he took leave of absence to work in Syria and nearby Arab countries for the Food and Agriculture Organisation.

He established a reputation for his capacity to cooperate with, bring practical knowledge to, and marshal resources for teams of specialist researchers. Underwood, Bennetts and Reg Rossiter, a CSIRO scientist, were among his colleagues in the solution of a range of management issues with livestock. In studies of botulism in the 1930s he was an integral part of the investigation team working on feeding regimes. In the 1930s he published a number of papers on management of fat lambs. He was also part of the team that first investigated the breeding problems of sheep on subterranean clover pastures—the problem which became known as ‘clover disease’.

He became Deputy Director of Agriculture in 1961 and in that role proved to be an outstanding administrator, taking a particular interest in the development of younger members of the staff.
George Henry Burvill

George Burvill joined the Department of Agriculture as a cadet in 1927 and was appointed as an agricultural adviser in 1930. He became Assistant Plant Nutrition Officer in 1937 and was appointed Commissioner of Soil Conservation in 1947. In 1956 he was appointed as Chief of the Plant Research Division and in 1969 and as Assistant Director. He retired in 1971.

Burvill graduated from the University of WA with a BSc(Agric) with first-class honours. He had distinctions in all subjects during his degree, an achievement only matched by one other graduate. From 1930 to 1935 he worked on the soil surveys in the Lake Brown district, Lake Carmody and Lake Camm areas west of Lake King and then the Salmon Gums district which followed Teakle’s report. In 1937/38 he spent a period with CSIR Soils Division and the Waite Institute in Adelaide on study of the salinity problems of the Kerang area in Victoria. For this work he was awarded a Master’s degree.

His main work after return to WA in 1938 until appointment as Commissioner of Soil Conservation in 1947 was in a team looking into the nutritional problems of sandy-surfaced soils. This followed the identification of copper deficiency at Gingin which triggered a widespread interest in trace element deficiency. This work provided the basis for the development of the 1950s and 1960s.

In 1944 he led a soil survey of the Ord River Valley which was the basis of the establishment and subsequent management of the Ord River irrigation scheme.

In 1947 he took over the infant Soil Conservation Service which had been established under Teakle in 1946. In the following nine years he worked with limited resources and limited support from the community to establish an ethos of conservation of the State’s soils. It was almost 30 years before the community in general started to give strong support for conservation of soils as part of the growing commitment to conservation of natural resources. In 1956 he took over the Plant Research Division from Dunne and oversaw its expansion into a potent research unit within the department. The division worked on a range of issues over the next 50 or more years making a major contribution to the successful development of both existing agricultural and the light land areas.

After early retirement in 1971 he edited the book *Agriculture in Western Australia—150 years of development and achievement 1829–1879* which was part of the State’s sesquicentennial celebrations in 1979. He also prepared a final report on the Salmon Gums soil survey which due to other pressures had not been completed. The Salmon Gums survey remains one of the largest detailed soil surveys ever carried out in Australia.

Burvill was inducted into the Royal Agricultural Society’s Hall of Fame for his contribution to agriculture in WA.

He became renowned for his encyclopaedic knowledge of Western Australian soils, vegetation, and geography. While this was not his main contribution to agriculture he was an important reference point on many issues for professional colleagues of all ages with whom he shared his knowledge generously. When he died in 1992 the comment was made that “a library of information had died with him”.

Meredith Ryers (Bill) Gardiner

Dr Gardiner was born in the USA in 1913 and obtained his BS(Chem Eng) and later VMD (Doctor of Veterinary Medicine) at the University of Pennsylvania. His early career involved several universities and in private industry, a period of war service with the US Navy in the Pacific followed by private practice in northern Queensland before returning to the USA.

In 1959 Dr Gardiner was appointed Veterinary Pathologist in the Animal Health Laboratories. Later in that year he became Chief Veterinary Pathologist following the
retirement of Dr Bill Bennetts. In 1966 he was appointed Chief Veterinary Surgeon and Chief Inspector of Stock, and occupied this position until his sudden death in 1976 at age 63.

Bill Gardiner was recognised for his great capacity for work and his enquiring mind, and he applied both of these characteristics to a wide range of veterinary problems in Western Australia, both as a researcher and an administrator. During his time with the department he published over 85 scientific papers on a range of topics including lupinosis, selenium and nutritional myopathy, clover disease, various poisonous plants, internal parasitism, and diseases being tackled by State eradication and control programs including bovine tuberculosis, bovine brucellosis and cheesy gland in sheep. He identified the presence of a large number of diseases not previously reported.

Dr Gardiner made huge contributions to scientific knowledge on lupinosis, selenium and animal health, clover disease and cobalt nutrition in ruminants. He made the first comprehensive descriptions of the pathology of lupinosis, and his review published in 1967 is still widely referred to. He was the first person to conclusively prove that lupinosis was a mycotoxicosis (in 1966), but was beaten to publication of the identity of the causative fungus by the South Africans in 1970. He conducted extensive studies into the epidemiology and pathology of nutritional myopathy in sheep and the association with selenium, building a base of knowledge in Australia for others to build on in coming decades. His investigations and reviews of clover disease and cobalt deficiency are still considered essential reference materials. His research achievements were recognised with the award of the degree of DVSc by Melbourne University and foundation membership of the Australian College of Veterinary Scientists.

During Gardiner’s period of leadership, the Animal Health Laboratories were developed into a complete diagnostic veterinary laboratory with the full range of diagnostic disciplines, and he built up a team of well-trained scientists that formed the foundation for the excellent reputation this organisation developed. He also oversaw considerable expansion of field veterinary services and directed greatly increased animal health field activities throughout the State. Dr Gardiner was also a member of the planning board and the Veterinary School Committee during the establishment phases of Murdoch University.

**Stanley Thomas (Tom) Smith**

Tom Smith joined the department on graduation in early 1944. He was a farmer’s son with a sound general knowledge of agriculture and excellent interpersonal skills. He worked initially in the Plant Nutrition Branch where his first job was taking part in the first soil survey of the Ord River Valley. In the early 1950s, he was appointed Senior Soil Research Officer with specific responsibilities to develop research programs to increase understanding of the expanding wheatbelt salinity problem and to devise practical ways of maintaining agricultural production on affected farmland. In particular, he initiated studies into the direction and movement of groundwater in wheatbelt valleys using techniques which had not previously been applied to the agricultural salinity problem. Under his direction, work on the selection and propagation of salt-tolerant plants was promoted.

Tom Smith was one of the early proponents of clearing restrictions on actual and potential water storage catchments in the South West. Although this advice was largely ignored at the time, a number of catchments were subsequently revegetated at very considerable cost.

In 1969 and for several years in the 1970s, low rainfall led to many areas in the wheatbelt encountering a serious lack of on-farm water supplies. The government organised special measures to provide relief. As part of these arrangements Tom Smith, in association with the then Rural and
Industries Bank Commissioner, Jack Gabbedy, put in place emergency supply measures. These included drilling programs, pumping water from fresh and brackish lakes, and trucking bulk water supplies into water deficient districts. Tom Smith’s appreciation of the seriousness of the situation and his empathy with farmers’ problems ensured a very rapid response. He then encouraged staff to develop new and innovative techniques to maximise run-off into farm dams and to minimise evaporation and seepage losses. They were also encouraged to design computer models to estimate optimal dam and catchment sizes for a given sheep flock size in a range of rainfall and evaporation zones.

Tom Smith’s expertise in soil matters was recognised when he was appointed in the 1960s as a soil specialist assisting a UNESCO project in the Sudan. With his sound knowledge of the soils he was heavily involved with the Ord River Scheme and served on the Kimberley Research Station technical advisory committee. He also supervised further soil survey work on the Ord and elsewhere and undertook some early studies of salt movement in the soil profile under irrigation on the Kimberley Research Station. He was appointed Chief of the Soils Division and Commissioner of Soil Conservation in 1966. He took responsibility for the general oversight of the department’s work on the Ord. He was appointed Deputy Director in 1971. The department lost a very valuable officer with his early death in 1981.

**Thomas Edward McDowell**

Tom McDowell joined the department on graduation in early 1949. His first advisory post was in Esperance but he moved to Narrogin early in his career. In Narrogin he was highly regarded for his work across a very large district. In the eastern parts large areas of light land were being developed for agriculture, requiring a lot of attention. Tom was a pasture and crop enthusiast and his work at Narrogin demonstrated both the value of topdressing pasture and the enormous advantage of applying superphosphate to pasture as close as practicable to the start of the season compared to early topdressing.

Tom also played a pivotal role in the development of the experimental area at Forrestania some 30 miles east of the rabbit-proof fence to determine its suitability for farming. This area demonstrated that agriculture could be successfully extended into that area on light land. The heavier soils carrying forest and mallee had been looked at for the 3500 farms scheme and rejected, but the combination had proved to be economically viable elsewhere. A monument to his work now exists on that site even though the government decided not to extend settlement into the area.

In 1967 he moved to Perth as Assistant Chief of the Wheat and Sheep Division and in 1969, Chief of the Division. He became an Assistant Director in 1971 and Deputy Director in 1981. His sudden death in late 1982 was a great loss to the department.

**Alfred Richard (Dick) Tomlinson**

Dick Tomlinson initially joined the clerical service of the department but was appointed as Acting Chief Inspector of Vermin in 1949. This position was later confirmed and with the creation of the Agriculture Protection Board in 1952 he became its first Chairman and Chief Executive Officer. Due to potential administrative conflict and the intention that the board would remain closely allied with the department, the Act was subsequently amended to make the Director of the Department of Agriculture the *ex officio* Chairman, and Tomlinson remained the Chief Executive Officer.

The success of the board over the next 40 years was a tribute to the energy, vision and insistence on work being a cooperative effort with farmers, local government and the board. Rabbits, which had been a plague, were controlled with innovative poison programs and warren ripping, even though
myxomitosis was not as effective in WA as elsewhere.

Wild dogs in the pastoral areas were also brought under control largely through identifying their breeding areas and carrying out a targeted aerial poisoning campaign. There was some (but less) success with the fox. This was largely due to difficulty getting the same degree of cooperative action coupled with greater difficulty in getting an effective control measure.

Caged birds were also brought under control in order to avoid accidental introduction of serious pests into Western Australia. A particular success was the prevention of starlings from reaching the State as rabbits and foxes had done.

During his period of office the rabbit-proof fence was modified. The No. 2 fence was largely sold; the No. 1 and No. 3 fences were joined and with the remainder retained as a vermin-proof fence. The work on weeds was also far better managed than in other states because of the legal capacity to have action taken. A particular success was the control of skeleton weed. Independent study showed that this weed was potentially a serious problem. This has not occurred because of the farmer-funded control program.

**Robert John (John) Lightfoot**

John Lightfoot joined the department as a cadet and completed his agricultural science degree at the University of Western Australia and was appointed an adviser in the Sheep and Wool Branch. In the 1960s he spent three years at the University of Sydney undertaking a PhD. He resigned from the position of Executive Director of Animal Industries in 1998 to join an agricultural lime supply company, Aglime, as manager of exploration and mining.

John’s major interest was research. Much of his work was related to the reproductive physiology of the sheep. This included the impact of high isoflavone subterranean clovers, nutrition during and before mating and the management of rams during the joining period to increase the efficiency of joining, the use of deep-frozen sperm in artificial insemination and the movement of sperm in ewes following insemination. He investigated the important components of clover disease, which had returned as a major problem in the 1960s and 1970s. This research led to a range of recommendations to minimise the depression in fertility of ewes associated with grazing on clover-dominant pastures. Later work showed an effect on ewe fertility remained even on ‘balanced’ pastures. He also clarified management and production issues associated with lambing ewes at different times of the year.

The opportunity for higher stocking rates than those used traditionally by farmers had been demonstrated by the late 1950s as had the importance of measurement as a tool in selecting superior sheep in breeding programs. Lightfoot promoted both these ideas strongly to the industry. In the early 1960s he was involved in the encouragement of Merino stud breeders to use objective measurements in the selection of sires. This involved visits to many of the larger studs to demonstrate the benefits resulting from weighing rams, from weighing fleeces at shearing and having the diameter of the fibres measured rather than using visual crimp scores. Regrettably, the studs were not initially receptive to these ideas.

Perhaps his most important contribution to the sheep industry was organising the importation of Awassi (a fat-tailed meat and milking breed) sheep from Cyprus through a very vigorous import and quarantine protocol. This was controversial, with concerns expressed by the conservative fringe of the wool industry about the possibility for black fibre contamination of the Australian fleece. The downturn in recent years of wool had boosted live export industry. This industry has been helped by the capacity to export the preferred fat-tailed sheep to Middle Eastern markets. This capacity developed in the 1980s.
John Lightfoot's expertise in sheep production was widely recognised and over a 15-year period he was heavily involved in advising the sheep industries in Libya, Nigeria, Tunisia, Iraq, Saudi Arabia and China. He retired at an early age, which was a serious loss to the department.

**William John (Jack) Toms**

Jack Toms joined the department in 1952 after graduation from the University of WA. He was appointed to the Plant Nutrition Branch and after gaining experience, including some time on Esperance Research Station, he was given the responsibility for managing the branch’s work in the wheatbelt. This demanded a lot of cooperation with the advisers in the field. At the time the Jerramungup War Service Land Settlement Scheme was being developed. Investigating the needs of this area was a challenge in itself. All the experimental work had to be done with farmers’ or the scheme’s machinery and there was no accommodation, so camping was required.

Development of the western sandplain centred on Eneabba was also creating special problems, developing large areas of deep sand. As the development push slowed Toms became interested in the use of nitrogen across the wheatbelt and carried out the initial work on its use. He also initiated the early experimental work on continuous cropping.

With the first blocks on the Ord River Scheme about to be allocated he was sent north to supervise the planting of trial areas. He grew 30 acres of cotton as the first crop in 1961/62 and 200 acres in 1962/63. The first commercial crop was grown in 1963/64. As an indication of his energy and commitment he fertilised and weeded the first 30 acres by hand and did the same on the 200 acres with the help of a potential block owner. He was dependent on a private company for equipment for planting, spraying and harvesting but found them peculiarly uncooperative.

Later he was a vigorous research leader, described by one of his staff as “challenging, stimulating and fiercely supportive of his staff”. He oversaw the modernisation of plant breeding in the department. He was appointed Chief of the Plant Production Division and later Assistant Director in charge of the department's research program. Overall he made a major contribution to the industry.

**Barry Richards**

Barry Richards joined the department as a cadet and graduated BVSc from Queensland University. On graduation he joined the veterinary pathology staff and was appointed Chief Veterinary Pathologist in 1990, retiring from that position in 2004. He returned to the role from late 2006 to early 2009.

He was involved with the establishment of the regionalised veterinary laboratory services and initiated the concept of specialist functions in regional laboratories. The success of this was reflected in the Albany Regional Laboratory being designated as the national reference laboratory for ovine footrot. This resulted from the development of a definitive test for the virulent form of the causative agent of footrot at that laboratory. This provided the means of carrying the footrot eradication campaign forward as a control program.

A 1980 Senate Select Committee report concluded that “on welfare grounds alone, there is sufficient evidence to close the live sheep trade”. This report had to be dealt with, for this trade was a vital component of the sheep industry. Richards became actively involved in research into the causes of death in live sheep export. He was backed by considerable industry support and his team were able to identify the major causes of death and the risk factors. The recommendations from this work, adopted by the industry, halved the annual death rate and allowed exports to continue. It is almost certain that the trade would have ended in 1986 without this research.
In 1990 an administrative decision was made to charge for laboratory services deemed to be for private rather than public benefit. Following the 1994 review, the private services portion of Animal Health Laboratories was formally rolled into a business unit (AGWEST Animal Health). This meant that revenue had to cover the cost of providing the services. The business grew steadily until the end of the 1990s and has remained at about $2 million a year since. The business unit now uses export testing to hone the skills essential for maintaining the State’s ability to handle high-volume testing in the event of an exotic disease outbreak.

In the late 1990s the Commonwealth asked the states to increase the quality of their laboratory services, primarily to enhance its bargaining power in negotiating international trade protocols. The WA laboratory was the first Australian Government laboratory to obtain accreditation under the National Association of Testing Authorities of Australia (NATA) in the relevant fields of veterinary testing. Engineering the cultural shift and the funding the program was a major undertaking.

Richards also initiated an Australian-wide system, called Syndrome Surveillance, which aims to collect, collate and report the data from the testing for about 12,000 outbreaks of animal diseases annually. This activity is essentially the reason Australia knows it has no ‘exotic’ disease. Previously this valuable data sat in State laboratory IT systems and was not used to demonstrate the extent of active disease surveillance in Australia. The system is now installed in the key performance indicators of the National Animal Health Laboratory Strategy (NAHLS).

Richards also had a major role writing and workshopping the business plan (defining the deliverables and key performance indicators) for the National Animal Health Laboratory Strategy. The outcome was long overdue and required each jurisdiction to provide sufficient good quality services to make a major contribution in the event of an exotic disease outbreak.

**DG (David) Wilcox AM**

A request from the Pastoralists and Graziers Association led to the appointment of David Wilcox as the first agricultural adviser to the Mulga Zone, a vast area extending north from Kalgoorlie and Yalgoo, to Gascoyne Junction and to Newman and east towards Giles. In 1955 he took up residence in a disused hotel in Wiluna, where mining had ceased in 1948. He continued to work in the rangelands of WA and in Australia generally for 31 years and became Principal Rangeland Management Officer.

He combined studies with keen and accurate observations of the clear changes which had taken place in the 100 years of settlement, to develop a fundamental understanding of the natural pastures of the region. This involved identifying the relationships between trees, shrubs, grasses and herbages, the ever-changing rainfall and the grazing pressures imposed by domestic and native grazing animals. This allowed him to formulate a number of grazing management regimes and to identify the adverse impacts of unsustainable stocking rates on the multitude of distinct pasture resources in the region. In association first with JG (John) Morrissey and AA (Andrew) Mitchell, he published a definitive book *Guides to the Arid Shrubland Plants and Their Use*.

His abilities in landscape description equipped him to lead the first survey of land resources and their condition in the Gascoyne catchment, which began in 1969. Using land description methods pioneered by CSIRO and developing a methodology for land condition assessment, he was able to report on the location and severity of land degradation for each lease and to make recommendations for the future use of the leases. This innovative approach has continued to the present day. Almost all leasehold land in WA has been described and assessed in sufficient detail to allow for reports and recommendations for all leases to be prepared.
As a result Western Australia has no rival for the quality and extent of its knowledge of its pastoral resource base. The Gascoyne catchment report was followed by the search for effective and reliable methods for measuring trends in land condition. Wilcox began, with others in 1972 to develop a method for measuring change in pastoral condition. This led eventually to the adoption of a Western Australian Rangeland Monitoring System (WARMS). It is the most reliable spatial system of recording changes in Australia. When lease-specific monitoring systems, also pioneered during this time, are included, this State has the capacity to ensure that its leasehold land is managed sustainably. David Wilcox was appointed a Member of the Order of Australia for services to the environment and to Australian rangelands in particular. He received the Centenary Medal for services to the Western Australian pastoral industry and the Order of the Quart Pot by the Pastoralists and Graziers Association. He founded the Australian Rangeland Society, which is devoted to the science and art of using Australian rangelands in a sustainable manner, and was its first president. A rare acacia, A. wilcoxii, has been named after him as a token of his distinguished career in Australian rangelands.

**David Lawrence (Dave) Chatel**

David Chatel graduated from the University of WA with a BSc(Agric)Hons in 1960, MSc(Agric) in 1964 and PhD (1968). He joined the department as a research officer in the Division of Plant Industries in 1967. In the early years Chatel continued his university studies into the development of new strains of inoculant Rhizobia aimed at overcoming serious nodulation problems in large areas of young subclover-based pastures. The work resulted in one of his strains being used throughout Australia and overseas. It was an example of an ecological study into an agricultural problem, and its resolution was often quoted in the literature.

In subsequent years he investigated and overcame nodulation problems with lupins and medics that involved strain development and inoculation methodology. His awareness of possible specific Rhizobial requirement for legumes collected overseas resulted in seed collectors bringing back seed with nodules and soil from which the bacteria could be isolated. This resulted in acid-tolerant Rhizobia being collected with medics from Sardinia. Early in the 1970s David Chatel became involved with research into the subclover disease, clover scorch. After the causative organism had been identified by plant pathologist Atilla Bokor, David and Clive Francis embarked on a breeding/selection program that resulted in the production of a new resistant variety of subclover, Esperance.

He also worked on the Jezira project in Iraq and produced an inoculant *Rhizobium* isolated from native Iraqi medics that proved to be very effective when introduced to Iraq for the project farms. He was the Australia-based coordinator of the project *Australian Contribution to the National Agricultural Research Project* (ACNARP) in Thailand which was funded by the World Bank. He was an outstanding scientist with an International reputation for work from the fundamental to the applied on the vital *Rhizobium* link to the host legume. He was the author of three book chapters, 22 refereed papers, 18 conference papers and 22 technical reports and extension papers. Much of his time from 1980 until he left in 1996 was in administrative positions, ranging from Officer-in-Charge of the Plant Pathology Branch to positions in the executive.

In 1983 he was appointed Principal Plant Pathologist, and in 1986, Chief of the Plant Research Division, and in 1987 he became Director of the Plant Industry Division. From 1992 to 1994 he was Manager of Plant Protection and Chief Quarantine Officer (Plants), and in 1994 to 1995 he was A/Executive Director Plant Industry. He retired in 1996.
Michael Leslie (Mick) Poole

Mick Poole graduated with a BSc (Agric) from the University of WA in 1965 and joined the Plant Research Division as a pasture research officer working on establishment of legumes on new land. In 1970 he transferred to crop research, investigating the competitive effects of sowing pasture under crops. With the growing importance of minimum tillage, he began working on aspects of the developing technology and providing leadership over the next 15 years. With the transfer of the Weed Research Group to the Plant Research Division he moved to the leadership of that group. In 1987 he was appointed Director of Enterprise Development with responsibility for new industry development, overseas projects and intellectual property. In 1991 he was appointed Executive Director of Plant Industry. He resigned in 1994 and moved to CSIRO as head of the new CSIRO Centre for Mediterranean Agricultural Research.

Mick Poole published extensively on his work and the issues associated with the development of the new cropping systems. This included the competitive aspects of pasture establishment under crops, new crops for the southern wheatbelt (particularly rapeseed/canola), effects of waterlogging on crop and pasture production, aspects of weed competition and fertility build-up and rotations, and environmental impacts of the new cropping systems. He later provided overviews of the developing alternative cropping systems. He also oversaw the department’s overseas programs in Iraq and Saudi Arabia and contributed to the projects in north-western China and Iran.

He represented the department on a wide range of State and national committees and held personal appointments to a number of national committees and organisations. These included Chair of the Australian Plant Industries Committee and National Pasture Improvement Coordination Committee. He spent several years on the board of the Grains Research and Development Corporation, chairing its research committee.

Mick has been recognised by award of the Centenary Medal, Urrbrae Medal and the Farrer Medal for his contributions to agriculture. He was also elected a Fellow of the Australian Academy of Technological Sciences and Engineering and a Fellow of the Australian Institute of Agricultural Science and Technology.

Clive M Francis

Clive Francis joined the department having completed his PhD at UWA. He retired in 1999 after 33 years, of which seven years from 1992 were spent as Deputy Director of CLIMA, the jointly-funded Cooperative Research Centre (CRC). He was awarded both the Farrer Medal (1985) and Institute of Agricultural Science Medal (1982). He was perhaps Australia’s most successful pasture plant breeder. In the period 1975 to 2000 the group he led release of a large number of commercial pasture cultivars or species. There were nine low isoflavone subterranean clover cultivars, two low isoflavone red clovers, three new medics, one Persian clover, one serradella, one bitter vetch and three high isoflavone red clovers for a drug company.

The concept of free-seeding easily-harvestable pasture varieties as an alternative to subclover and medics was a new approach which he promoted. It was brought to fruition as a phased pasture system through the efforts of other staff. This approach resulted in no less than six new pasture species for Australian farmers.

Gathering and utilising a wide range of genetic resources was an underlying part of his career. He developed strong links with the famous Vavilov Institute in Russia and was awarded the Vavilov Institute Memorial Medal in 1999. The link developed with the Vavilov Institute resulted in over 4000 accessions of grain legumes being introduced to Australian collections. He also travelled extensively on plant collection tours.

He collected plants from other parts of Australia and from Spain, Portugal, Morocco,
Ethiopia, Libya, Israel, Syria, Iraq, Iran, Sardinia, Cyprus, Greece, Crete, the Canary Islands, Madeira, Turkey, Armenia and Georgia. These missions resulted in a number of commercial releases and dramatically widened the genetic base of the breeding program.

**HG (Jack) Neil**

Jack Neil joined the department in September 1948. He was located at Moora for much of his period as an adviser. He had a special interest in sheep and sheep management and in pasture development. Jack enthusiastically applied his skills to the animal industries and in particular the scientific approach to wool improvement. He also made a valuable contribution as a trainer of young advisers in their early years of development of professional service.

In recognition of his contribution in the area of sheep management he became OIC of the Sheep and Wool Branch in 1965. There he built up the fleece testing laboratory and developed a cooperative approach with a large proportion of the State’s parent and commercial Merino studs. With the reorganisation of the department in 1977 he was appointed Chief of the Animal Production Division.

In 1971 he undertook a study tour of Middle Eastern countries to look at the live sheep industry and discuss with the purchasers and their customers the type of sheep wanted. While the exporters and importers focused on older fat wethers his investigations indicated that the customers would have preferred younger sheep. Over the years the industry moved in that direction and is now dominated by the export of younger animals. In all his roles he was an outstanding officer. But in his early years he also made a particular contribution to re-establishing the department’s country-based advisory service which had been decimated during World War II by enlistments, resignations and transfers to other duties.

**Lionel Dawson White**

Lionel White left school to work on the family farm at age 15. He then spent some years in the RAAF during World War II and trained as an agricultural scientist after being demobilised. He joined the department in 1951 and was appointed initially to Katanning. He decided to return to the family farm but after a short time returned to the department and was appointed an adviser at Northam.

Lionel was a livestock enthusiast with a passion for proper grazing management. He saw this as a keystone to successful crop rotation in minimising take-all disease in wheat and set up many grazing demonstrations to show the impact. After some years at Northam he moved to Perth as a senior adviser. When the department was reorganised in 1977, as the first step in its eventual regionalisation, he was appointed as the first Assistant Director in charge of the Regional Services Division. He acted as Deputy Director for a period before his retirement in 1983.

**Ronald John (Ron) Parkin**

Ron Parkin joined the department as a cadet and was appointed as an adviser on completion of his degree in 1962. He worked initially in Geraldton and then Esperance. After obtaining a Diploma in Agricultural Extension at Melbourne University and a short period in head office he spent four years at Albany as Officer-in-Charge and two years leading overseas projects before moving to Perth in an administrative role. He resigned to take up consultancies in overseas programs in 1991. Ron was a very able and effective extension officer, a very good field research worker and an able administrator. After he left the department he was sought after by International agencies.

At Geraldton as an adviser he also had a substantial program of applied and adaptive on-farm research. He was energetic and innovative and was involved with the development of the preparation of lime-pelleting of legume seeds in large scale
quantities, identification of the importance of cereal cyst nematode in the Geraldton district, the introduced Harbinger medic and demonstrating management options for medics, subclover and rose clover. While at Esperance he played a major role in the establishment of the Johnson Lakes experimental area to test its suitability for farming as well as continuing in extension and field research.

During his period at Albany the office was developed as one of two pilots testing the regional conduct of research and extension, as part of the developing regionalisation policy in the department. Core research staff were located at the office in animal health and production, agronomy, plant pathology, entomology and horticulture. Interdisciplinary teams were established including a regionally-based economist.

In early 1980 he accepted the role of team leader of an agricultural development project in the Jezira area of northern Iraq. This proved to be a very challenging undertaking for technical and political reasons. He followed this with a period as Principal Overseas Projects Officer with the Western Australian Overseas Projects Authority (WAOPA), responsible for the servicing/management of overseas agricultural projects in Libya and Iraq. After a brief period as Principal Extension Officer located in Perth, he took over as team leader of the Western Australian cooperation with the AusAID and World Bank-funded National Agricultural Research Project, Thailand (ACNARP) in 1983. This involved the development of 19 regional research centres along the general lines of similar organisations in Australia. In 1984 returned to the Department as Assistant Director in charge of regional services. He held this position until his resignation in 1991. Ron Parkin was an outstanding officer, which was reflected in extensive and varied career.

Richard Frank (Dick) Buckley

Dick Buckley joined the department as a messenger in 1934. After a short time there he was transferred to the Mines Department. In 1940 he enlisted in the Army, then rejoined the Department of Agriculture in 1946 and spent the rest of his working life there. He became a stores clerk and by the mid-1950s was in charge of the Stores Branch. He became a legend for his capacity to get things done through the complex Public Service system which existed at the time. Although not a high profile member of the organisation he was greatly appreciated by a generation of the department's employees and was a most valuable officer.

Richard Frank (Dick) Buckley.

Olga May Goss

Having won an Exhibition to study science at the University of WA, Olga Goss graduated with a BSc with honours in zoology. After a short period as a lecturer and demonstrator at the university and working as a pathologist at the Children’s Hospital, Olga then joined the Department in 1945 as a plant pathologist. In her 35 years of service she worked on a wide range of issues, particularly in the early years when there were only two other plant pathologists.

Olga retired in 1980 as a highly respected senior plant pathologist. She took a particular interest in nematodes and published papers on eelworm infection of
potatoes and other vegetables and also took the leading role in the investigation of eelworm problems in viticulture, orchards and cereals.

Olga pioneered the control of nematodes on bananas at Carnarvon and showed the importance of using resistant rootstocks in viticulture and orchards. She identified the existence of resistance to eelworm infection rootstocks of peach trees and also summarised the overall position of eelworm in WA and the available control measures.

Prior to the advent of commercial production, Olga also oversaw the provision of a wide range of Rhizobia to other researchers and to the farming community. Her other great interest was in nursery hygiene and she published a handbook on this subject drawing on local, interstate and overseas experience.

In recognition of Olga’s contribution in this field she was honoured with the Australian Nurseryman’s Award in 1978 and in the same year was elected Nurseryman of the Year.

Plant pathologist Olga Goss was closely involved with the early work on eelworm infestation and had a close association with the nursery industry.

Olga was also a ground breaker and was the only female member of the professional staff. Initially she was rarely allowed to make field trips because it was thought that growers would be reluctant to accept advice from a young girl. Ironically, she spent most of her working life on farms assisting growers with their problems. At first she was not permitted to spend a night away from the office. The final problem was that she was not as well paid as male graduates in comparable positions.

**Laurence (Laurie) Snook**

Laurie Snook graduated with a BSc(Agric) in 1932 and an Honours degree in 1935. He was awarded a Hackett studentship and studied at the Rowett Institute in Scotland. His work in Aberdeen related to pregnancy toxaemia in sheep. He demonstrated that the problem, then known as twin lamb disease, was due simply to a shortage of energy in the latter stages of pregnancy. For this ground-breaking work he was awarded a DSc. This was important in WA because of the autumn lambing practised here.

He began research at Cambridge University but with the outbreak of war returned to Australia to enlist. He saw service in North Africa and Tobruk. He was transferred to the medical corps as a pathologist and served in Palestine, New Guinea and Bougainville before discharge with a rank of Captain. He rejoined the Department in 1946 and worked as Officer-in-Charge of the Animal Nutrition Section. He resigned in 1962 and worked until 1979 for FAO in many countries. He was awarded Fellowships of the Australian Institute of Agricultural Science in 1979 and Society of Animal Production in 1988.

His work on phosphorus deficiency in high yielding dairy cows was also very important. Phosphorus supplementation resulted in both increasing production and improved fertility. Attempts to improve the phosphorus level in pasture were not successful but he was able to demonstrate that dissolving a soluble phosphate (superphosphate) in water and sprinkling this on feed in the bail was quite effective. This work was carried out at Bramley Research Station which was purchased for the purpose.

He made a separate and important contribution through promotion of tagasaste (tree lucerne) as a fodder for cattle. As a boy
he had observed the hardiness and the preference for the shrub among farm animals in summer in the wheatbelt. Having established a small area at the Animal Health Laboratory in Nedlands, he measured its productivity. This showed it could be very productive but despite his promotion there was little professional or farmer interest until the 1980s. Eventually it was tried by farmers who developed methods of having it grazed by cattle rather than having to harvest and hand-feed it. It proved to be particularly useful on the deep sandy soils of the western sandplain. In 1988 Laurie Snook led a group to the Canary Islands, where tagasaste came from, to look for other genetic material. His resignation at an early age was a loss to the department. He has been inducted into the Royal Agriculture Society’s Hall of Fame.

**Stanley Edward Hardisty**

Stan Hardisty graduated from the University of WA with a BSc(Agric) degree, joined the Horticulture Division, and worked on issues in the fruit industry for his whole career. He is listed here for the major contribution to reducing the cost of sending apples to Europe, work which he began in the 1960s. During the first 65 to 70 years of the 20th century England was a major market for WA-grown Granny Smith apples. In the late 1960s and early 1970s access became difficult. This was partly due to competition but primarily to cost.

Freight was a major component of costs. In the 1960s, Hardisty worked on the use of loose-packed bins rather than cartons. However, refrigerated containers were introduced in the early 1970s and soon became the only means of consignment. The new challenge was to ship a maximum amount of fruit in each container.

Bulk bins which Hardisty had developed earlier gave greatly increased stowage. In 1979 the next step was to consign a sea container full of ‘loose’ apples. This trial proved successful as were small shipments of a few containers consigned by South West growers (from Donnybrook and Manjimup) over the following two seasons. The loading of apples into the containers was done by a conveyor belt of half the length of the container with a false door to ensure control when unloading. On arrival at Tilbury the containers were loaded onto a truck and delivered to an importer at Canterbury and unpacked with equipment built in WA and consigned on an earlier ship. The pack-out quantity was high.

The move to container shipment was a big cost advantage and also resulted in handling being transferred away from the port workers of both countries. Packing and unpacking were in the hands of experienced staff in the orchard areas and in the importers’ warehouses. Previously, hardwood dump cases were manhandled by dock labour at both exiting and inward ports, resulting in heavy bruising. In contrast, the pack-out of the bulk containers was excellent, with no downgrading for the observed pressure points which were small and shallow, with no discolouration.

**John Ernest Cripps**

John Cripps joined the department in 1955 and was posted to the Horticulture Division in 1955 as a research officer. Biennial bearing had been a problem of the apple industry for many years. It was a particular issue for exports producing smaller fruit during the ‘on’ years and large softer fruit in the ‘off’ years. Neither was ideal for the export market. Cripps was able to demonstrate that chemical thinning of the heavy crops gave good crops in the ‘light’ years and overcame this problem. He also demonstrated that heavy super dressings overcame die back of mature trees. This was in contrast to earlier work. He was also in charge of the work at Stoneville Research Station which showed that the Malling Merton rootstocks bred in the UK were superior under WA conditions. These rootstocks are now universally used in the industry.
John Cripps' main achievement came from apple breeding. This program was reluctantly approved initially but over the years proved a great success. As in most breeding work selecting the right parents and managing a large volume of material are the secrets to success. In apple breeding it also requires a long-term commitment—20,000 plants were protected from cross-pollination each year and 108,000 seedlings were produced over three decades.

Apple breeder John Cripps bred the Pink Lady™ and Sundowner™ varieties.

In the late 1980s two new cultivars were selected and registered as Cripps Pink and Cripps Red. Both were grown commercially and high quality fruit marketed as Pink Lady™ and Sundowner™. It was reported that 20,000 Cripps Pink trees had been planted by the industry to June 1990. In 2008 Western Dawn, marketed as Enchanted®, an apple which does not brown after cutting, was released. In 2008 the Cripps Pink was grown in 15 countries and sold in 30 countries.

In 1989 Cripps was put in charge of the eradication of apple scab from WA. The campaign involved the destruction of 45,000 trees, spraying of non-infected orchards and raising the hygiene standards in the industry. It was successful and WA became the first State to eradicate the disease. Earlier, he was involved in the initial plantings of vines in the Manjimup district, which has led to the establishment of the industry in Manjimup. He retired in 1998. In 2010 he was inducted into the Royal Agricultural Society Hall of Fame.

Clive Vincent Malcolm

Clive Malcolm graduated from the University of WA in 1955 and joined the Department of Agriculture. He later completed degrees of MSc(Agric) in 1963 and an MSc from the University of Manchester in the UK. He retired from the department in 1991. His major work with the department was on the revegetation of saltland. While this work had been started some years before, he approached it with skill and determination, recognising the extent of the salinity problem in WA and the difficulty of the work he was undertaking.

The key issues were to first identify plants which would grow in the environment and select ones which were palatable to stock. It was then necessary to find methods of establishing them across large areas and finally to determine their value to livestock. He established a major collection of salt-tolerant plants, then together with a farmer, developed the innovative Mallen seeder. Having established good stands of saltbush and bluebush he was able to stock them and determine their carrying capacity. He promoted the value of saltbush and published the first paper on its value as a summer feed. He was instrumental in forming the Australian National Program on Productive Use and Rehabilitation of Saline Land (PURSL). This laid the foundation for the Cooperative Research Centre for Plant-based Management of Dryland Salinity based at UWA.

He was a gifted communicator, equally at home at an international conference as he was discussing issues with farmers on their properties. He inspired others to carry on his work and turned it into a mainstream activity from being a minor part of the whole saltland
management issue. He was inducted into the Royal Agricultural Society’s Hall of Fame for his work.

**John Sylvester Gladstones**

John Gladstones was an outstanding plant breeder. He set out as a young scientist to convert the bitter New Zealand blue lupin into a crop plant. It was known to be suitable for the WA climate and widely used as a green manure crop in the horticulture industry. It was also known that the New Zealand blue lupin genus was suitable for the light soils of WA.

It took nearly 25 years of meticulous breeding and selection before the first crop plant was produced. Essential features were low alkaloid content (sweetness), non-shattering pods and white flowers. While it illustrated the potential for the lupin as a crop plant, it had a number of defects and with further work over the next 20 years a range of varieties suitable for planting across a range of climates was produced. In addition, resistance to introduced diseases was bred into the varieties. This work included developing resistance to the fungus *Phomopsis*. When Phomopsis-infected lupin plants were exposed to summer rain a toxin was produced which killed sheep grazing on the dry lupin stubble. This made the grazing of lupin stubbles hazardous and the solution increased the value of the crop tremendously. The development of the lupin as a grain crop is covered in Chapter 7.

In the continuous cropping system the lupin is a legume and break crop which also provides build-up of nitrogen. The development of an important crop plant which has a range of uses in such a short period was an outstanding achievement.

As part of his research at the University of WA, Gladstones also found time for breeding and selection of subterranean clover strains. Separate from his work as a plant breeder, John Gladstones carried out intensive studies of climate and soil conditions for producing high quality table wines and had an important role in the establishment of Margaret River as a premium wine district.

His work was recognised when he was among the first inductees to the Royal Agricultural Society’s Hall of Fame.

**Jeremy Allen**

Jeremy Allen studied veterinary science at Queensland University as a cadet with the department. He graduated in 1972 with first class honours and an honours degree in veterinary pathology.

He worked as a veterinary officer in the Bunbury office in 1973 and 1974, spending much of his time managing the brucellosis and tuberculosis eradication programs in the region, and conducting disease investigations. In 1975 he moved to the Animal Health Laboratories in South Perth as a veterinary pathologist.

Jeremy Allen took the lead role in studying the epidemiology and pathogenesis of lupinosis associated with sweet narrow-leaved lupins, and did so for the next 15 years. During this time he developed management techniques to significantly reduce the risk of lupinosis in sheep grazing lupin stubbles, published numerous papers in the scientific literature and gained his PhD for this work. He worked closely with the plant breeders over many years. During the period he tested the toxicity of many hundreds of lupin samples from breeding
lines. These results guided the breeders towards their ultimate goal. He then conducted the field grazing trials that proved the success of the phomopsis-resistant lupins in preventing lupinosis.

From the mid-1990s Dr Allen directed most of his attention towards annual ryegrass toxicity (ARGT), and was a lead researcher in a four-year Australia-wide survey of the contamination of harvested grain by the bacterium that caused ARGT. This identified that this contamination could potentially devastate the grain export industry and resulted in funding of extra studies to develop answers to the problem. One of these, a five-year study of the ability of the twist fungus to reduce the prevalence of the causative organisms of ARGT, was conducted by Dr Allen. He was also funded to investigate the risk of secondary toxicity resulting from the consumption of animal products sourced from livestock consuming toxic ryegrass. The negative finding from this research gave the meat and dairy industries confidence that produce from Western Australia presented no risk to consumers.

Jeremy Allen won the Australian College of Veterinary Scientists’ Ian Clunies Ross Memorial Award for excellence in veterinary research in 1981, and the Western Australian Society of Animal Production’s RJ Moir Medal for a significant contribution towards improving the animal production industries in 1990.

He has published 157 papers, reviews and chapters in the scientific literature and a further 56 articles in general industry publications, on topics including lupinosis, ARGT, nutritional myopathy, poisoning of livestock by various metals, plants and fungi, mineral metabolism in ruminants, McArdle’s disease in sheep, nutrition of pigs and infectious and neoplastic diseases in livestock.

Jeremy Allen had an outstanding career and at 2008 continued to work in the department.

**Narenda Nath Roy**

Narenda Roy was born in East Bengal, India, in 1923. He graduated from the East Bengal University in science and agriculture in 1939. He was awarded a masters degree from the Indian Agriculture Research Institute in 1950 and a PhD from Cornell University after winning a Rockefeller Scholarship in 1958.

He was recruited as a wheat breeder by the Department of Agriculture in 1969. He was transferred to work on rapeseed when the potential industry was wiped out by the fungus disease blackleg in 1971.

By 1977 Roy had material which had a low erucic acid content and good resistance to blackleg. These crossbreds were regarded as having early enough maturity to be suitable for a considerable part of the South Coast. The program was continued to develop further earliness and greater resistance. Lower glucosinolate content was also introduced to improve the quality of seed meal left after the oil was extracted. The aim was to produce varieties with sufficient early maturity to extend rapeseed growing into the wheatbelt proper by crossing with very early varieties obtained from India.

In 1978 a new rapeseed variety which was low in erucic acid and resistant to blackleg was released. It was named Westway and was produced from a cross between French and Canadian varieties. It was also earlier maturing and suitable for later planting or lower rainfall conditions. In 1980 two new rapeseed varieties, Wesbell and Wesroona, were released and were expected to increase sowings of the crop. In 1987/88 a gene for complete blackleg resistance was imported from the wild mustard plant (*Brassica juncea*). This was combined with the field resistance already present and the crossbreds inherited a high level of blackleg resistance in the field.

From 1987 he bred rapeseed varieties that were resistant to blackleg and had low erucic acid and glucosinolates. In 1991 another variety named Narenda which he had developed was released for the medium
rainfall areas. Progress was also made in developing improved oil qualities and resistance to shattering. The advances in blackleg resistance, together with the development of shattering resistant types of rapeseed, further highlighted the success of the program. It was recognised as leading the world in several lines of breeding and attracted much overseas interest. The material was in great demand from breeding programs around the world. He afterwards spent time in China as an honorary consultant and teacher. He visited Canada in 1989 and Germany in 1991. He retired from the Department of Agriculture in 1998 and joined Cornell University as an emeritus professor, finally returning to Australia after he retired.

**Peter Portmann**

Peter Portmann joined the Department of Agriculture in 1969 as barley and oat breeder, following graduation from University of Adelaide with a BAgSc. In 1980 he was appointed to manage the Plant Breeding Section. He then focused on barley breeding. In 1987 he became responsible for managing all crop breeding, grain quality testing, crop variety testing and crop seed production. In 1993 he also took over responsibility for managing all cereal and legume agronomy. He resigned in March 1997 to take up a position with the Grain Pool of WA.

On joining the department he recognised that plant breeding was a 'numbers game' and to be effective, breeders needed to be able to evaluate a large number of genotypes across a wide range of environments. In order to achieve this he concentrated his efforts on automation and computerisation of the plant breeding systems. It was also necessary to be able to manage small amounts of seed accurately at planting. This involved replacing the traditional 12-run drills with cone seeders. He also developed extruded plastic seed magazines for handling seed for plant breeding trials. These magazines became the basis for all plant breeding work throughout Australia and many other countries. He also converted small plot combine harvesters from three-person to single-person operated machines. To do this he developed a pneumatic grain transfer system to carry grain from the back of the machine to discharge alongside driver. This was then incorporated into both brands of small plot harvesters—Hege and Wintersteiger.

In conjunction with a young colleague, Arnold Rosielle, he developed software for the design of trials, printing of field books and the collation and processing of data. They also developed electronic weighing and data capture and the use of hand-held dataloggers. The net impact of these innovations allowed plant breeding to become much more efficient, with capacity increasing from 360 plots per person per year to a potential of more than 10,000.

Portmann was part of the team which saw the release of some 15 barley and 10 oat varieties, including a number of benchmark varieties. He also developed a working relationship with breeders at the University of WA to convert two competitive barley breeding programs into one collaborative program. This was a very successful partnership and was directly associated with the release of important varieties. The program focused on breeding for climatic zones. Part of the program aimed at developing shorter-strawed varieties for the southern districts. This was based on introduction of semi-dwarf genetic material from Canada and Europe. The program produced key oat and barley varieties for this region, one of which was adopted worldwide.

**Mark Sweetingham**

Mark Sweetingham joined the department in 1983 after completing his PhD at the University of Tasmania. Until 1993 he worked as a plant pathologist in the areas of biosecurity and diagnostics, disease management in the farming system and breeding for disease resistance. During the
period he determined the cause of major root diseases of the narrow-leaved lupin and researched *Rhizoctonia* diseases of wheat, barley, canola and legumes. His discoveries laid the foundation for the development of an agronomic management package for lupin diseases and for resistance breeding technologies. He also pioneered the fingerprinting of *Rhizoctonia* pathotypes explaining the nature of the host range of different pathotypes and establishing a basis for establishing crop rotation and tillage approaches.

This work was the basis for establishing the need for a detailed understanding of the epidemiology of major grain diseases in different environments. He established a national and international reputation as a result of his work on *Rhizoctonia*. Later, as a research leader, he was instrumental in developing the AGWEST Plant Laboratories. Until the time of reporting he had been the principal investigator of 23 industry-supported programs attracting over $6.5 million. He was the principal author of 50 scientific publications. He was also instrumental in establishing a number of collaborative research programs with CSIRO and the Grains Research and Development Corporation.

He moved into increasing administrative roles beyond 1999 across all grain cropping areas. In this period he contributed significantly to strategic planning and alignment of agricultural R&D to the critical needs of industry. He also contributed to the development of national policy in his areas of expertise, representing Western Australia on national research and policy committees.

**William (Bill) Bowden**

Bill Bowden joined the department as a cadet in 1969. Because of his exceptional academic performance he was released to undertake a PhD, then he rejoined the department in 1973. He developed a reputation for great “intellectual horsepower and capacity for data accumulation and organisation”. His made a major contribution in the organisation of data and the description of that data in models. In particular he focused on phosphate and nitrogen use, producing models capable of forecasting need on the basis of past history, soil type etc.

The original model was known simply as ‘Decide’ and retained that name as it was progressively improved over the years. He also became a leader, consultant and adviser to many of his colleagues, particularly young researchers seeking guidance in their careers. He set high standards for himself and expected the same from his associates. While he could have pursued a career as an academic or fundamental researcher he chose to stay at the cutting edge of applied science. The department was fortunate to retain his services for the whole of his career.

**Ron Jarvis**

Ron Jarvis joined the department as a cadet in 1963. He completed his BSc(Agric) in 1966 but was called up for National Service and served in 1967 and 1968. He worked initially as an adviser, first in Northam and then Lake Grace. He was very successful in Lake Grace from 1971 to 1980. While there, he diagnosed severe copper deficiency on crops where copper had been added with the superphosphate. He found this was due to the copper being immobilised in the granules produced by the particular fertiliser mixing technique. A spring copper spray was found to be the solution.

In mid-1980 he moved to the Plant Research Division. In 1981 he identified the advantages of cultivation to a greater depth than seed was planted. He then started work with Chamberlain John Deere, resulting in the release of a suitable combine which allowed deeper cultivation and shallow seed planting. In 1982 he identified the problem of hardpan development in some sandy soils of the wheatbelt. He successfully promoted the use of deep ripping to overcome the problem. In 1983 he also identified and did the first experiments on the use of narrow-
pointed tynes which allowed seed to be sown near the surface while fertiliser was placed deeper as a viable method of improving yield. The initial aim was to minimise the effect of the disease Rhizoctonia.

In 1984 he was able to demonstrate the long-term advantages of minimum tillage on the level of water-stable aggregates on heavy soils. In 1990 he demonstrated the advantage of deep banding of superphosphate on the yield of lupins. In 1992 he was awarded the Urrbrae Medal for outstanding contributions to Australian agriculture. From 1993 onward he conducted a large field experimental program investigating the extent of these issues. He retired early in 1998, shortening a career which had made a major contribution to agriculture.

**John Hamblin**

John Hamblin joined the Department of Agriculture in 1977 after completing a PhD at Adelaide University, then further studies at Cambridge. He worked on lupin breeding with John Gladstones in the Plant Production Division. The initial breeding had been focused on the major genes but with the program expanding he worked on disease resistance (mainly Phomopsis and brown spot) and developing mechanisation and field-testing processes.

His early experience convinced him that many of the problems of growing lupins were due to poor management rather than poor varieties. Together with an experienced adviser and farmer a new lupin management package was developed and demonstrated to farmers in the northern agricultural areas in 1979. The demonstrations involved two varieties, early versus late planting dates, use of simazine to control weeds, depth of seeding and good versus poor quality seed. Farmers were harvesting seed like wheat and not as a more sensitive dicotyledonous crop. Despite 1979 being a drought year, the correct treatments (early variety, early planted, good quality seed at the shallow depth with weed control) gave yields averaging 1.6 t/ha. The wrong combination gave yields of 0.3 t/ha—equivalent to farm yields in that year.

After a short time with the Victorian Department of Agriculture he returned to Geraldton as a research agronomist with a brief to develop the regional research effort. Observing that on the sandplain farmers were getting better lupin yields than cereals he worked on improving cereal yields, forecasting that they would double by the year 2000. This was achieved by the average farmer with good farmers achieving trebled yields.

In 1986 he left Geraldton to take up a senior appointment. The foundation he had built was developed by enthusiastic young staff. His own research efforts were severely constrained by administrative roles in the department, overseas and at UWA. He had a philosophy aimed at solving real problems that improved farming systems, rather than taking a more discipline-focus to components of systems. Hamblin made a substantial contribution to the development of lupin agronomy and the whole new cropping system which became ‘normal’ cropping practice.

**Don MacFarlane**

Don MacFarlane came to the Department of Agriculture after working as an exploration geologist in mining and completing an MSc and a PhD in hydrogeology. This was unusual at the time as most professional staff had agricultural science degrees. With the assistance of Rick Engel of the department and Greg Street of the Mines Department he applied geophysical techniques used in the mining industry to dryland salinity problems. This mainly involved using magnetometers to map dykes and electromagnetic induction to locate salt storages. Small businesses were established to provide ground-based and aerial services to farmers and catchment groups as a result of this work.
In association with CSIRO the group developed satellite remote sensing methods for mapping dryland salinity, waterlogged cereal crops and remnant vegetation condition. They also developed prediction maps for salinity. The remnant vegetation mapping was extended to mapping above-ground biomass for carbon accounting, for which they were awarded the CSIRO Chairman’s Medal—which carried a $150 000 prize. This method has been applied in other countries and was adopted as the international standard by the Clinton Climate Initiative.

The Catchment Hydrology Group which Don MacFarlane led in the Department of Agriculture was also influential in natural resource management. They divided the South West into four regions for management purposes, and these became the basis for the natural resource management regions that used Natural Heritage Trust and National Action Plan funding for the next 15 years. Don established the NRM group for the South Coast region while based at Albany for 11 years.

His work on waterlogged soils helped to resolve the conflict between the WISALTS organisation and the scientific community. The WISALTS movement advocated bulldozer-built level banks as a means of stopping the spread of salt. In practice it was shown that crop growth in saline areas could be greatly improved if waterlogging was prevented. On the original property at Brookton where benefits from building banks was first claimed this would have been the situation. Working with Tim Negus, then Narrogin OIC, Don MacFarlane used shallow seepage interceptor drains to remove waterlogging on duplex soils. This did not add recharge to the saline aquifers as the WISALTS banks had. When this was demonstrated to the chairman of WISALTS the organisation stopped advocating level banks.

**Ross Kingwell**

After a double major in agricultural economics and agronomy at the University of Western Australia, Ross Kingwell joined the Department of Agriculture in 1977. He developed an interest in farm modelling and along with David Morrison and later David Pannell, helped develop a computer-based farm model named MIDAS (Model of an Integrated Dryland Agricultural System). In 1987 Wageningen University published a seminal book that described MIDAS and its policy and research applications. It was edited by Ross Kingwell and David Pannell. During the 1980s and 1990s Ross Kingwell gained postgraduate qualifications and continued to regularly publish his research and collaborate on a wide range of projects and research issues. He developed another farm model known as MUDAS (Model of an Uncertain Dryland Agricultural System) that incorporated price and seasonal uncertainty. In the late 1990s he joined the staff of the University of Western Australia as a fractional academic appointment. There he supervised the research of scores of honours and other postgraduate students.

He was appointed as both Chief Economist in the Department of Agriculture and Food and a Professor of Agricultural Economics at the University of Western Australia. Through his efforts and those of his many colleagues, the department and its modelling staff rose to national prominence and Western Australia became regarded as a centre of excellence in farm modelling. The department's modelling work is detailed in Chapter 8.

**Key extension officers**

The following officers are dealt with as a group because they were all outstanding extension officers and were the post-war pioneers of the Department of Agriculture’s country-based services. In the early years office accommodation was poor, the department was small and the information base was just developing. At the same time major expansion was occurring in the
agricultural areas, with farmers requiring a lot of professional advice both about initial development and subsequently about the developing technology. This group represents the cadre of extension officers, most of whom are not mentioned here, who all made an important contribution to the industries they serviced and to the work of the department.

**Gerald Ledsham (Gerry) Throssell**

Gerry Throssell started his career with the department as a cadet and was appointed as an adviser in 1927. He was a member of GL Sutton’s second cadet intake. He joined the army in 1940 and returned in January 1944. He then spent the rest of his career as a district adviser in Geraldton.

At one time he covered the whole of the agricultural area north of Perth. It was in the very early days of legume pasture development and he strongly promoted the sowing of Dwalganup subclover which became widespread on both heavy and light land. His enthusiasm was shared by a renowned farmer of the era from the Walebing-Miling area, Sir Edward Lefroy. In the early 1950s they formed the Miling Pasture Improvement Group, the prime function of which was the development of annual legume-based pastures. This was the forerunner of an explosion of Pasture Improvement Groups (PIGs) over the next decade and by 1960 there were more than 50 groups established throughout the WA wheatbelt alone.

Gerry Throssell had a classic approach to extension. He was always careful to operate through the influential people in each recognisable community, whether they were shire officials, organisation officials (Farmers Union) or farmers who were widely respected among their peers. His modus operandi was to ensure he visited each locale not less than once a month. He always made sure he had at least one solid message each visit whether it were some recent research results or the experiences of farmers from other locations. It was this need for new, locally-focused information, and his association with farmers which led to the development of district on-farm trial programs.

In 1957 a mobile planting unit arrived in time to plant the experiment program. The unit consisted of a 12-row disc drill on loan from the Massey Ferguson Company (under persuasion from the Mendel-Wongoondy Pasture Improvement Group) and a four-wheel drive Land Rover plus a two-wheeled trailer. The Land Rover served to transport the unit and act as a tractor for the drill. Use of these units went a long way to differentiate which species and varieties were best suited to different soils and localities. It was this large expansion of on-farm trials that became the cornerstone of extension in WA over the next three decades. The mobile units are covered in Chapter 7.

Gerry Throssell retired after 37 years of service in 1965 with his unique contribution largely unrecognised at the time.

**George Halpin**

George Halpin joined the Department of Agriculture in January 1946. He spent most of his career in Katanning, where he was an experienced adviser and a valued member of the community. He had a special interest in animal husbandry, which was appropriate for the district at that time. At the time there was extensive development of light land to the south-east and east of Katanning and the demands on George were very heavy. He was an adviser who made a tremendous contribution in a quiet, unassuming way to the development of agriculture in the south-east of the State. Towards the end of his career he was appointed Principal Coordinator of Research Stations, a position he held until his retirement in 1982.

In the early 1970s he led the first group of farmers who went to Libya to demonstrate Western Australian farming techniques. The work was carried out on the Gefara Plain, south and south-west of Tripoli. This was a particularly challenging undertaking as
accommodation was basic and general facilities quite rudimentary. It was to the group’s credit that they managed and put the project on a sound footing from the beginning. The saga of the Libyan project probably warrants a book of its own.

**Henk Suijdendorp OAM**

Henk Suijdendorp was a deck officer on the Dutch liner *Orange*, but married a girl from Toodyay, and subsequently graduated with a degree in agricultural science from the University of Western Australia. With his family he left Perth in early 1951 to work with the recently established North West Branch at the Abydos Woodstock pastoral stations in the Pilbara about 150 km south of Port Hedland. These stations had been abandoned for some years and were purchased by the government in 1946 when the sheep industry in the Pilbara collapsed. The government’s aim was to attempt to revive the industry through improving pasture productivity and examining sheep husbandry problems.

Life in the bush did not start well. Henk’s home was to be in the old homestead on Woodstock. It was over-run by wild cats and on his arrival he found that 24 rams had also taken up residence in the abandoned building.

Henk Suijdendorp was the first research officer in the Pilbara and began his ground-breaking work on pastoral land management in this most difficult of environments—the spinifex shrub steppe. In a series of outstanding experiments he found that it was not drought or dingoes which had caused the decline in the sheep industry, but over-use of the tussock grasses within the spinifex communities. The frequent burning practices adopted by pastoralists had also reduced the amount of feed available to sheep as cool winter burns favoured spinifex at the expense of the palatable and productive edible tussock grasses. Having defined the problem he was able to show in a further series of experiments that the degraded lands could be restored to their earlier productivity through combinations of resting from use and burning in summer.

These large scale experiments were among the first rangeland grazing studies in Australia. The results revolutionised grazing practices in the Pilbara with the rapid and widespread adoption of Henk’s recommendations. In a general sense the findings also showed the sensitivity of the fragile semi-arid communities to incorrect management. In this case it had reduced the capacity of pastoral land to support domestic stock.

Following his success with grazing management Suijdendorp then began investigations into sheep reproduction and wool production in this very challenging environment. Important issues included the season and its influence on the time of mating and the interaction with the grazing system. Low lambing percentages and disappointing wool production in ewes had been important factors in the poor performance of the pastoral industry. He was quickly able to show that a deferred grazing system, and the resulting increased amount of tussock grasses available, increased lambing percentages as well as increasing wool production. In addition he showed that early mating was essential for good lambing percentages and survival. Late mating when lambs were dropped in August reduced lamb survival as the tussock grasses had dried off after mid-winter. He also showed the advantage of using locally-bred rams which had greater libido and performed better than rams introduced from the south.

His fine research work and ability to convey the essentials of management to pastoralists gained him the admiration of a whole generation of lessees in the Pilbara and over a wider area in Western Australia. He was awarded the Medal of the Order of Australia for services to agriculture in 1980.

**Raymond James (Jim) Doyle**

Jim Doyle was a Muresk Agricultural College graduate who went on to complete a degree in Agricultural Science at the University of
WA. He was posted to Geraldton in 1956 to work as an adviser with Gerry Throssell. Jim was given control of an on-farm experimental program in collaboration with Perth-based research officers. Over the next six years he pioneered the use of an experimental planting unit donated by a group of farmers, and developed a program of some 20 trials a year. In 1962 he transferred to Esperance as officer-in-charge of that district.

Two highlights of the field research program drew widespread attention: The first demonstrated highly effective lime pelleting of inoculated seed as a technique to separate seed and fertiliser. This reduced some types of 'seedling mortality' in subterranean clover sown on virgin sandplain soils.

The second was a significant wheat yield increase in 1960 resulting from the application of molybdenum—a world first which was repeated in 1962. The response was first observed by farmer Trevor Way. Both trials were carried out on Wodjil type light soils at Gutha. They resulted in the demonstration of widespread molybdenum deficiency in the eastern wheatbelt.

Jim reinforced this blend of research and extension in the rapidly developing Esperance region between 1962 and 1972 and again in head office where, among other roles, he facilitated cooperative research programs between research and extension officers. He also arranged the replacement of, and funding requirements for, field equipment including mobile planting units. He helped build a prototype cone seeder in collaboration with plant breeder Peter Portmann and workshop manager Laurie Liddell.

Jim originated the publication of the Agricultural Memo local newsletter (see Chapter 8). The 'AgMemo' proved so successful it became used in all the department's country offices.

Peter Nelson

Peter Nelson arrived from England in 1961, joined the Department of Agriculture and was stationed at Northam as an adviser to the wheat and sheep industry, mentored by Lionel White. In 1963 he transferred to Katanning with George Halpin and moved to be the first adviser at the small Lake Grace office. From 1968 to 1970 he trained in the USA as a cotton agronomist and in 1970 he moved to Kununurra. After seven years at Kununurra during which the cotton industry collapsed due to the cotton bollworm developing resistance to all available insecticides, he transferred to Geraldton.

There he made a major contribution to the adoption of lupins as a crop plant and its integration into the 'new cropping system' as the key legume in the rotation.

He resigned in 1996 but continued to serve the industry, spending 14 years as the lupin and crop production specialist with the Grain Pool of WA.

Peter Nelson was an outstanding officer who made a big contribution to both the department and to the industry.

Gillie Brown

After graduating in the UK and migrating to Australia, Gillie Brown joined the department in 1982. She was appointed to Narrogin and was the first female general agricultural adviser appointed to work in a country office. She was there for some 12 months, moving to Moora in 1983. She spent almost five years there, proving to be very successful. In particular, she enjoyed field days, which she managed very effectively. She carried out some of the first quantitative work on the value of lupin grain as a supplementary feed for weaner sheep.

In 1988 she transferred to Perth as OIC in charge of crop variety testing. In this role she redesigned the crop variety sowing guide, making it much more user friendly and informative. From 1994 to 1996 she led a wheat marketing project aimed at bringing the wheat quality message to growers. This
followed an AWB announcement in April 1994 that it was going to pay premiums for protein, a challenge for the majority of growers who grew low protein wheat. A major information program was undertaken to give advice to growers before the crop was planted.

From 1995 to 1997 she was manager for the markets of Japan and Korea. From 1997 to 1999 she was Executive Officer of the Horticulture Products Partnership Group dealing particularly with the outcomes of each project. From 1998 to 2001 she was project manager for floriculture industry development in addition to her role as executive officer of the partnership group. In 2001 she was appointed Senior Development Officer for Horticultural Intellectual Property.

Gillie Brown continues to work in the department, having had a varied and valuable career, starting as a successful field adviser.

Arthur Cyril (Cyril) Linto

Cyril Linto joined the department as a laboratory assistant in 1949 and was appointed a stock inspector in 1953. He worked for some time on the TB eradication program, the initial attempts to eradicate footrot from sheep, and on general quarantine inspections. In 1959 he was transferred to Kalgoorlie to take charge of the inspection of stock being transported into WA. He remained there until he retired in 2007. For the first 20 years he had the dual role of Stock Inspector and Regional Weed Control Officer. In 2000 he was awarded the Australian Public Service Medal for his outstanding work.

In the period from 1959 to 1969 the dramatic increase in the cleared area and sown pastures resulted in a parallel demand for livestock, particularly sheep, which could not be met from within WA. As a result, large numbers were imported from the eastern states. In one four-year period he inspected more than 1.2 million sheep. Over the 10-year period more than two million sheep came through Kalgoorlie. A major concern was weed seeds carried in the wool and it was not unusual for sheep to have to be shorn. His thoroughness and toughness in a difficult role became well known to all importers. Without doubt his work played a major role in keeping a wide range of noxious weeds out of WA.

Separately, he was responsible for developing a certification system to allow the transport of pastoral sheep into the agricultural areas, reducing the area of noxious weeds in the pastoral areas near Kalgoorlie, and undertaking the initial survey of the habitats of starlings as part of the program to keep them out of WA.

Cyril is here as an outstanding example of the work done over the decades by the army of inspectors who worked in the Department of Agriculture.