Chapter 5

1995 to 2008: a change of focus

The political aim during this period was for the Department of Agriculture to become more focused on issues beyond the farm gate. A major review of the department and associated organisations made significant changes in the structure of the three relevant organisations. While internal changes were relatively small, loss of key staff and uncertainty about leadership and job security seriously damaged morale.

A key decision that advisers should not deal with farmers on a one-to-one basis progressively broke down the close relationship between departmental officers and farmers. This in turn shifted the focus more towards research and less on farmers' day-to-day issues. All this was coupled with reduced government funding. Nevertheless some good work was done in traditional and post-farm gate areas. Natural resource management moved progressively from local areas to catchments. New technology and improved facilities improved research support. At the end of the period cereal breeding was privatised.

The department

In the early 1990s a major review of the Agriculture Portfolio was undertaken covering the Department of Agriculture, the Agriculture Protection Board and the Rural Adjustment and Finance Corporation. The review was initiated in September 1993 and the report was submitted in October 1994. While its recommendations were progressively implemented over the following 18 months it is hard to see that they made any substantial difference to the overall thrust of the existing administrative structure except for the effect on the Rural Adjustment and Finance Corporation and the Agriculture Protection Board. The review did however introduce an internal financial management system which proved inappropriate for a research and extension organisation.

The first part of this chapter deals with the recommendations, implementation and outcomes of the review, followed by a brief discussion of the overall situation of the department at that time. It then deals with the activities within the framework provided by the review.

During the period there was a major change in the basis of reporting to a system which embraced some of the ‘modern’ administrative theory. This increased the administrative load on the department, with doubtful improvements in accountability. It certainly would have diverted resources from the ‘front line’, to work required to satisfy the central agencies.

In November 1994 the then Director General of the department resigned, apparently because of differences with the Minister on the implementation of the recommendations of the review. A new Director General was appointed during 1994/95 and in his June 1995 report he commented that: “… future priorities will reflect a strong market orientation to research and development, a commitment to the sustainable development of agricultural production and land use and a renewed commitment to protection of the agricultural resource. There will also be a stronger focus on the delivery of services from regional bases”. A similar statement had been made by his predecessor in 1993 and would be made by his successor.

During the period there was a significant shift of focus. This had started in 1992/93 and was driven by a perceived need to help smaller and developing industries with the
costly task of finding markets and identifying market need. The identification of market opportunities was also important to the grain industries. This had been achieved within the existing framework of physical and professional resources of the department. There were major gains in the grain export and production area where improved plant breeding capacity was able to develop cultivars to meet new market needs.

Work in the wool area was undermined by lower prices, leading to a progressive reduction in the size of the industry. In the horticultural area export marketing of vegetables was significantly reduced in Asia by competition from China. Some other industries were helped to develop but this did little to offset some of these difficulties.

**The 1994 Portfolio Review**

The Hussey Review of 1994 was commissioned by the Minister for Primary Industry, Monty House. It was written in general terms and dealt with aspirations which, while commendable, were inherently difficult to turn into defined activities. However, it did recommend major changes to the focus of the department and the way in which the organisation was managed. The review recommended the adoption of a structure which divided the department into four major divisions:

**Policy and Planning** included strategic planning, program definition on industry lines, outcome statements, budget allocation to program managers, program evaluation, and industry program coordination.

**Programs** included industry focus supported by advisory arrangements, funding to achieve program outcomes, strong emphasis on regional program delivery and regional level program integration by regional management, with some program managers located at regional level.

**Technical and Regional Support** included skills, labour and infrastructure required by program managers. The majority of funding was from program managers with some direct funding from the department for infrastructure not required by individual programs.

**Corporate Services** included clerical and administrative support organised on a user-pays bureau basis. The reviewer saw the new structure being program-driven with a regional and industry focus. The three main programs identified were:

- Trade and market development
- Industry support including the Rural Adjustment and Finance Corporation (RAFCOR)
- Protection.

In the change, the RAFCOR Board was seen as a program manager purchasing its requirements from the Corporate Services Group or the market.

The Agriculture Protection Board was seen as an advisory group advising on the integrated protection services. The protection services would include vertebrate and plant pest control, quarantine and animal and plant inspection. The viewers saw a need for greater on-farm focus for vertebrate and plant pest control.

The possible inclusion of landcare and sustainability as part of asset protection in a broader definition of protection was flagged. The intention was that the Planning and Policy Office refine the current programs and that these refined programs form the basis of budget allocation in 1995/96. There was a focus on fully costing programs for allocation of resources.

It was claimed that the recommended systems and structure would allow the organisation to function in a more commercial manner. It was also claimed that the existing system was over-managed.

The review recommended the introduction of contestability as the basis for allowing private suppliers to compete to provide some services. A challenge for the Executive was to develop workplace agreements which
would encourage more flexible working conditions and a need to focus on customers.

The new arrangements required a Technical Services group which would:

- provide technical staff, resources and infrastructure for statewide and regional programs
- supply the services required by the programs.

It was recognised that a small group would need to implement the proposal. A program was broadly spelt out with the key implementation steps seen to be:

- establishment of a Ministerial Advisory Council to demonstrate determination to involve the industry more fully
- the specification of job mandates and selection of the management team to lead the portfolio
- establishment of the Office of Planning and Policy to initiate the process of program definition. The outcome specification was that the new program structure should be confirmed in time for budget considerations in 1995
- once the program structure was more tightly defined, attention would need to be given to definition and establishment of the proposed technical services groups
- completion of a support unit viability study of the corporate services area was needed to benchmark and establish the appropriate level of service likely to be required by the new structure
- upgrading of management information services would be necessary. These new systems should reflect the program management requirements of the new arrangements
- infrastructure planning and renewal planning should proceed to ensure that a long-term view of the best use of the asset base is available to management.

In reality, when it was analysed, the structural effect of the review was to marginally change the structures and approaches already in existence. The main thrust was a greater market-based focus. The department had in fact had a 'market-based' focus for much of its existence because it saw its customers and market largely as the farming industry. Marketing in terms of domestic and export markets was seen as a function of the private sector. Over the previous decade the department had become involved in market investigations and facilitation. It had also focused research on particular market needs.

The review also recommended the concept of contestability to obtain funding for programs within the department as a formal process. This was new and provided difficulties in areas where outcomes are difficult to measure. Contestability had always existed in the department as an informal process.

**Major recommendations of the review**

The review recommended that the organisation develop:

- a strong leadership and corporate culture driven by a clear vision for the role of the portfolio agencies and resources
- a comprehensive focus on market requirements through all of its activities and programs
- strengthened strategic planning and policy development and structural separation of the program definition from the delivery
- partnership with the industry that accesses industry advice and liaison at both ministerial and local/regional level
- a clear program management approach characterised by the application of the business unit model of management and an accountable management structure to replace the department’s current matrix management structure
- a simplified program structure with a clear orientation in all activities (including R&D)
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towards the achievement of policy and program outcomes linked to the portfolio objectives

- development of a work environment which values and rewards initiative, effort and excellence, recognising and building on the commitment of staff
- increased opportunities for private providers and industry to provide services through the program framework of the portfolio
- substantial program level integration of the RAFCOR and APB boards within the portfolio in the 1995/96 financial year
- integrated activities to achieve whole farm, regional and industry agricultural outcomes
- programs to emphasise and locate and resource the regional presence and impact of the portfolio.

The review recognised a need to communicate to industry stakeholders and agency staff on the implications of the proposed restructure and the broad thrust of the changes proposed.

Adoption of the recommendations

The 1994/95 annual report showed that the recommendations of the review were substantially accepted and being introduced. The department listed four broad objectives which reflected the government’s policy priorities:

1. Identify market opportunities and develop new and improved products to enhance profitability of the rural and allied industries.
2. Develop agricultural and pastoral production systems which optimise economic returns, while conserving land resources.
3. Implement assistance to agriculture and to help rural and allied industries to manage risk and uncertainty.
4. Minimise the impact of diseases, pests and weeds on the agricultural and pastoral industries and to ensure the maintenance of safety and quality standards in agricultural products.

The report again stated that over the past four years the department had changed its emphasis from one predominantly driven by production-based research to one with a much sharper focus on marketing. Improving productivity remained an important element but it needed to be tailored to the expectations of a much more discriminating and complex market. In future the department would be closely aligned to market opportunities.

The report commented that the development of Western Australian agriculture had been based on technologies developed to match the climate and soils. These technologies were unique and arguably the most efficient in the world. It also stated that the department contributed to the development of sustainable farming systems to ensure that the productivity of the resource base could be maintained or improved; it was involved in the protection of industry against the introduction of pests and diseases; and had programs for the control of endemic pests and diseases.

As recommended by the review, a Policy and Planning Office was established and the principles of program management were adopted.

All activities were undertaken as interdisciplinary projects within the four programs:

- Industry and market development
- Sustainable agricultural systems
- Industry support and assistance
- Protection, regulation and control.

All the department’s activities were initially located in 33 operational programs. There were several operational programs under each agency program, directed at achieving planned outcomes.

Each operational program had set objectives and outcomes and achievements with an economic focus, and:
was subjected to benefit-cost analysis
had a program leader responsible for coordinating and reporting the delivery of outcomes
had an industry committee to advise on priorities and to which the program was accountable.

Each member of staff was located in one or more operational programs and shared responsibility for the delivery of outcomes. The functions were described as:

- conduct of research to develop the existing and new technology which will help rural industry to maintain economic viability
- development of new products and handling or processing techniques
- provision of essential diagnostic services
- development and promotion of sustainable land use systems which maintain and improve the basic soil, vegetative and animal resources
- regulatory activities designed to protect rural industries, primary producers and the land resource.

Some regulatory activities were funded by the Commonwealth Government.
The department continued to charge for services, based on full cost recovery with some discounting if a component of public good could be identified. Apart from its overall research and advisory services the department provided animal disease diagnosis, cereal testing, government loan assessment, analysis of wine and certification of grapevines and seeds, plant disease diagnosis and seed testing.

During the year the second major policy initiative of contestability was flagged for later full introduction. This was competitive tendering for funding by programs and contracting between the program and the funding body to achieve certain outcomes. This process was totally within the department. Within Corporate Services several business service units were identified and the initial stages of competitive tendering and contracting began. A review of the department’s costing methodology was undertaken to complement the contracting and tendering process and to accommodate Treasury costing requirements.

During the year the department vigorously pursued further advancement of the business unit concept. This involved the identification and combination of existing similar service delivery areas into 'meaningful and functional' commercial units. This resulted in the realignment of 21 traditional delivery areas into 11 commercial units.

In 1996/97 the operational functions of the department were carried out under three headings:
1. Industry and Market Development
2. Sustainable Rural Development

Each of these programs was divided into delivery programs or sections. There were eight delivery programs within Program 1; Program 2 was based on six regional groups stretching from the South Coast to the Kimberley; Program 3 used the Agriculture Protection Board to manage and provide funding support and guidance. The board was aided by its 10 zone councils covering the State, with regional advisory committees within each zone.

The Office of Policy and Program Planning was responsible for strategic planning, budget allocation and evaluation, and policy development. It also managed ministerial issues, legislation and government business.

By 30 June 1995, the department had 38 per cent professional, 30 per cent technical, 7 per cent inspectorial, 16 per cent clerical and administrative, and 9 per cent wages staff. It had also implemented the Clockwork human resource management information system to replace its previous Personal Information Management System.

As a result of the 1994 review, the department (1613 full-time equivalents or FTEs), the Agriculture Protection Board (257
FTEs) and the Rural Adjustment and Finance Corporation (23 FTEs), were merged in July 1996 to form Agriculture Western Australia. Total staff of the three organisations at that time was 1893 FTEs.

The approved annual staffing level for the new organisation at 30 June 1997, including staffing for externally funded projects and functions for the Commonwealth, was 1768 FTEs. This comprised 1304 funded from Consolidated Revenue, 209 funded from Commonwealth programs and 255 from Rural Industry Grants.

A voluntary severance package offered in November 1996 resulted in loss of 119 positions. The loss was a significant and unfortunate outcome of the review, particularly as it included a number of senior and experienced officers who were the leaders, mentors and trainers of younger staff.

A total of 1714 staff members were employed at 30 June 1997, compared with the 1768 FTEs allowed. Of these, 856 were based at South Perth with the remaining 858 staff in country offices, research stations and inspectorial checkpoints throughout the agricultural and pastoral areas. The staff consisted of 568 (33 per cent) professional officers, 557 (32.5 per cent) technical officers, 169 (10 per cent) inspectorial staff, 323 (19 per cent) administrative and clerical staff and 97 (5.7 per cent) wages staff.

The amalgamation of RAFCOR with the department varied from the original intent of its establishment as an independent organisation. This was to keep the adjustment decisions outside political interference and separate from the research, advisory and inspectorial role of the department. By this time the rural adjustment schemes had largely finished but there was a need to administer exceptional circumstances funding and a number of similar activities. The amalgamation of the APB with the department may have had some advantages but these would have been small following the changes from the 1987 review.

Communication across Western Australia was dramatically enhanced through investment in a statewide communication and financial management information system. This facilitated the transfer of functions to regional and district offices.

As part of the decentralisation of the department 10 new Community Agricultural Centres were developed. These were designed to bring the delivery of agricultural support services closer to industry and to support local community development. They were the first part of a program to establish 40 community and cultural centres over a three-year period throughout Western Australia. The 10 centres were at Mullewa, Morawa, Wagin, Boyup Brook, Coorow, Gingin, Jurien Bay, Narembeen, Darkan and Wongan Hills. These offices were small, with two to four staff, and were distant from Agriculture Western Australia’s established offices. Not many more of the proposed offices were established in later years, probably due to staffing problems.

Again, the establishment of these offices was a departure from the policy set 40 years earlier to avoid small offices because of the generally improved performance of officers where support was available in dealing with complex issues. The later policy that officers should not initiate contact with farmers on a one-to-one basis seemed to remove the need for a greater distribution of staff in rural areas. By mid-2008 only 11 centres are listed outside previously established offices and research stations with four or fewer staff. Only two of these had professional staff.

In 1996/97 the total operating cost for Agriculture Western Australia was $137,026 million. Revenue for services and trust fund receipts was $44,438 million with the net cost of the department to the State being $92,588 million.

The Director General commented that there had been a distinct shift from bureaucracy to business. This had been accompanied by new opportunities to establish collaborative projects with industry. He also stated that strategic alliances between producers,
processors and exporters in the State and with markets overseas, had allowed the development of new products from Western Australia for the supermarket shelves in Asia.

In 1996/97 the department maintained a formal contact with the rural industry through some 66 committees, some of which were statutory and some related to statutory functions. Others were liaison committees of one form or another. The department was also responsible for the administration of 46 Acts of Parliament relating to agricultural matters.

In his introduction to the 1996/97 report the Director General commented again that:

- The agency had refocused its activities on the market, with particular emphasis on market needs driving research and development.
- The agency had established industry and regional partnership groups in each program area, comprising industry, business and community representatives to provide direction for the government's investment in agriculture.
- This process allowed the agricultural and rural sectors to have some input to the delivery of government support which had previously not been possible, but would be an ongoing part of the agency's planning.

It is not clear whether this change had greatly different outcomes when compared with the structure and industry committees existing before the review.

In his review the Director General pointed to a key component of the increase in agricultural productivity being the increase in yields in the cereal sector. This in turn had been driven by research and development and farmer innovation, which had led to a total change in crop production. The department's contribution to market access included the release of higher yielding varieties, with an emphasis on identifying new quality-discriminating markets.

It is doubtful if the 1994 review had any impact on these achievements except possibly to slow them down through loss of key staff.

The Director General also noted that while the wool market had been weak, sales of WA wool to India had increased rapidly. He attributed this to the department's drive in research and market development to establish direct links between the WA wool industry and the Indian mills.

There was a further advance in the development of the department's biological research capacity with the opening of a new biotechnology laboratory at the State Agricultural Biotechnology Centre at Murdoch University. The laboratory was to undertake collaborative research on new and existing molecular techniques. This was to include screening for identified quality traits and disease resistance to support plant breeding, and to support quality assurance and compliance initiatives in agriculture and fisheries.

In 1996/97 it was stated that the process of separating core policy and advice functions from operational services had continued. A review of the corporate services support at district offices identified those required locally and separated these from those that could be provided from South Perth. Corporate Services support for competitive tendering and contracting continued. A number of information services were outsourced, with a claimed saving of $970 000 or 27 per cent of the former costs over three years.

The milestones and targets of the First Enterprise Agreements which were entered into were achieved, providing the staff with an 8 per cent pay rise. Negotiations for the second enterprise bargaining agreement were in progress in 1996/97.

Following the formation of Agriculture Western Australia a new financial operational system based on the Funder, Purchaser, Provider model was introduced. This approach had been introduced by the Deloitte Company, which had provided
substantial advisory services to the review. It had originally been used in the United Kingdom. In Agriculture WA the Office of Policy and Planning was the Funder, the Industry Resource Protection, Sustainable Rural Development and Industry and Market Development Programs were the Purchasers, and Program Services and Corporate Services were the Provider. The principles underlying the model were based on:

- the need to separate policy, program prioritisation, and service delivery functions
- ensuring the policy developed by the Funder was aligned with agreed government policies and outcomes
- enabling the Funder to allocate budget to the Purchasers
- facilitating the determination of outcomes
- requiring each program to achieve its key performance indicators
- ensuring appropriate contestability in the provision of services
- facilitating a commercial client-focused approach by the internal Provider, Program Services and Corporate Services, in the delivery of projects on time, within budget and to agreed quality standards.

This system proved to be administratively clumsy and unsuited to a research organisation. It was finally abandoned after a change of government in 2001. Department personnel reported that it also reduced cooperation and sharing of short-term workloads between programs.

In 1998/99 it was reported that Support Services continued its investment in self-renewal and continuous improvement. This was facilitated by the establishment of a Business Improvement Team and further expenditure on developing policies and procedures and systems, together with substantial investment in staff training. It was claimed that the new arrangements provided a more robust and productive environment.

The particular areas of activity for Support Services were: training and staff development, staff recognition and reward, equal employment opportunity, disability services, occupational safety and health, hazard-based initiatives, workers' compensation, the government's two-year plan for women, standards in human resource management, asset management, internal audit, finance, information technology, freedom of information, records management, contracts and procurement (including fleet management), corporate services restructure and pricing policies. No information was available on how these issues were prioritised or the extent to which they were subjected to the form of competitive discipline used in the rest of the department.

In recognition of the increased risks associated with contracting, a specialist Contracting and Procurement Branch was created.

The staff level at 30 June 1999 was 1655. There was a trend towards more inspection and this was reflected in the distribution of positions. Professional staff were reduced by 44 (7 per cent), technical staff were reduced by 30 (6 per cent), the inspectoral staff were increased by 94 (72 per cent) and the administrative and clerical staff were reduced by eight (2 per cent). Wages staff were reduced by 22 (39 per cent). The actual numbers were professional 624, technical 444, inspectoral 225, administrative and clerical 354, wages 68, for a total of 1715. During the year the FTEs numbered 1655.

The approved staffing for the three organisations amalgamated to form Agriculture WA for the year before the amalgamation was 1893. The loss of FTEs in the four-year period was 178.

Over the next decade, as the impact of the 1994 review and the previous focus on a program-based management system took effect, there were substantial changes in the overall regional organisation. These changes are dealt with in more detail in Chapter 8.
effect the objectives of the 1977 review were reversed and district offices appear to have become places to house staff rather than integral units of the department. In fact there seemed to be a loss of the historical integration of units throughout the department with the introduction of program management. The ‘new age’ approach appeared to divide rather than unify the divisions responsible for their implementation.

There was also a significant centralisation of field research facilities and the number of research stations was reduced. In the South West this started in 1982 when Denmark Research Station was transferred to the Education Department and Bramley was closed. Wokalup was then transferred to the Education Department. In the horticultural industries Stoneville and Swan were closed. The result was that Vasse and Manjimup remained as the only research stations in the South West. However, they were very well equipped and capable of high quality research.

Previously, the Vegetable, Poultry and Pig Research Stations had been centralised at Medina. Floriculture was added later to that group. In the wheatbelt there was gradual erosion of available field facilities. Northam was transferred to Curtin University in the 1982 review; Newdegate was downgraded and largely leased; Chapman was sold; Avondale was transferred to the National Trust; Badgingarra was being transferred to a community group; Salmon Gums was closed; Esperance operated at a very low level; and Wongan Hills was largely leased after cereal breeding was privatised. Merredin appeared to be functional. Mt Barker, which operated largely as a medium rainfall station, was fully functional.

This left the department with few dedicated field research facilities in the wheatbelt. It was argued that this increased flexibility at a lower cost because district offices were well equipped and could undertake on-farm work as required. Certainly, closure of these facilities reduced the department’s capacity to undertake any long-term studies or to demonstrate new technology on a large scale. The wisdom of these decisions will be tested by the future.

The departmental offices in the South West outside of Albany where advisory (development) officers were based were Bunbury, Waroona and Manjimup. The Busselton, Harvey, Pinjarra and Bridgetown offices had closed. The dairy inspection service, once run by the Dairy Division and then by the Dairy Industry Authority, became the responsibility of the dairy companies. When the Dairy Industry Authority was responsible, the department still provided advice to farmers and factories. This contact appears to have been lost. The district offices in the wheatbelt appear to be maintained.

In 2006/07 the agricultural and related industries listed under the agriculture, food and fibre sector produced $5.5 billion. The cereal industries produced 44 per cent of this income, 22 per cent came from meat and animal exports, wool produced 12 per cent, horticulture including sugar 11 per cent, and dairy, honey and eggs accounted for 3 per cent, while pulses, pastures and oil seeds accounted for 8 per cent.

The value of exports of agricultural and food and fibre products from Western Australia amounted to $4.2 billion. Cereals provided 54 per cent, wool 13 per cent, meat and animal exports 22 per cent, horticulture 4 per cent, pulses and oilseeds 5 per cent, and dairy, honey and eggs 2 per cent of the total value.

The State Government outlined desirable outcomes for Agriculture Western Australia as to:

- increase competitiveness and profitability of the agriculture, food and fibre industries
- improve ecologically sustainable development of the agricultural industry
- manage biosecurity effectively
- provide services to the food and fibre industry’s development
• provide services to rural business development
• provide services to agricultural resource management and
• provide services to biosecurity.

In carrying out its responsibilities the department shared some funding and responsibility with other agencies. For example, in the National Action Plan for Salinity and Water Quality, which was jointly funded by the Commonwealth and State Governments, the Department of Agriculture was the lead agency together with the Department of Environment and Conservation.

Results were reported against agreed outcomes, efficiency indicators and financial targets.

The sources of departmental funding were the State Government 48 per cent, Commonwealth Government 24 per cent, research grants 15 per cent, revenues 8 per cent, and other sources 5 per cent. Utilisation of the department's budget by category showed the allocations were: employee expenses 37 per cent, grants 34 per cent, supply and services 14 per cent, capital use 4 per cent, depreciation 3 per cent and other expenses 8 per cent.

If the budget was divided on the basis of the area of service, agricultural and resource management received 44 per cent, food and fibre industry development 28 per cent, biosecurity 26 per cent and services provided to the Rural Business Development Corporation 2 per cent.

If the budget was divided on the basis of service to industrial areas, grain programs received 43 per cent, horticulture 20 per cent, wool 13 per cent, meat 8 per cent, trade and market development 10 per cent, new industries 3 per cent and dairy and apiculture 3 per cent.

The total staff at 30 June 2007 was 1660, of whom 703 (42 per cent) were professional, 431 (26 per cent) technical, 336 (20 per cent) were administrative and clerical, 53 (3 per cent) wages and 137 (8 per cent) inspectorial.

**Departmental activity**

The report stated that agriculture and the department were operating in an environment in which:

• consumer demand was leading to international and national agreements which increasingly specified standards for the consistent supply of safe, quality, environmentally friendly and ethically produced food and fibre products
• global sourcing of food and fibre products and progressive deregulation of international trade was intensifying competition for market share and premiums
• there was an impact of greenhouse development and policies and dryland salinity on agricultural productivity and the land available for traditional agriculture
• there were strong pressures on agricultural activity to control its impact on environmental values
• international trading policies were requiring trading partners to scientifically justify any biosecurity constraints on trade
• the adoption of new food and fibre production biotechnology would increase the intensity of production and become a major driver of change
• regional communities continued to experience population decline and associated reduction in core infrastructure
• community demand for services at state and federal level were placing pressure on availability of funds
• a concept of multi-functional agriculture had resulted in countries supporting agricultural businesses for non-economic objectives which would continue to distort markets
• there was a cost/price squeeze on farm profitability through prices for commodities falling in real terms
• risk management techniques were needed to deal with the range of risks to which agriculture is exposed
• climate change had emerged as a major issue.

In his 2007/08 overview statement, the Director General stated that the aim of the department was to provide the best possible service in order to make a valuable contribution to the sustainable future of the Western Australian agriculture, food and fibre industries. In order to do this the department was reviewing and updating its strategic plan and processes. It aimed to develop a monitored, evaluated and performance-measured framework in order to more effectively assess progress and be in a position to confront the many challenges and issues that would impact on it.

He also stated that the focus of the new strategic plan was on how the department was going to do its business rather than what it was going to do. He saw the impact of climate change and rapid advancements in food and fibre technology as ensuring that the department continued to experience exciting and challenging times. The department also initiated a staff development project to ensure staff quality was maintained in a tight labour market.

The targeted staff level for the department in 2007/08 was 1598. The average staff level for the financial year was 1499. The decrease was due to a reduction in the number of externally-funded projects. Of total staff, 42 per cent were professional, 25 per cent technical, 8 per cent inspectorial, 22 per cent administrative and 3 per cent wages.

In 2007/08 the department established a program for involvement of indigenous Australians. Activities included maximising the department's capacity to work with indigenous land managers, arranging for departmental policies, products and services to provide for indigenous needs, expanding indigenous employment and managerial opportunities within the department and the agricultural, pastoral and land management industries, and providing new services with a goal of achieving equity of service and outcomes for indigenous customers.

**Seasonal conditions**

The years 2000 to 2002 were very difficult climatically; 2003, 2004 and 2005 experienced average to above-average rainfall, but 2006 returned to very dry conditions; 2007 was a year of great contrasts, with southern producers and rangeland managers benefiting from good production conditions coincided with good prices for most commodities. At the other end of the scale, northern and eastern wheatbelt producers suffered through another dry season with very low production levels. Exceptional circumstances assistance was granted in a number of these years. In 2007 the scheme was extended to cover 37 regional shires and the WA Government provided $9.3 million in a dry season's assistance scheme.

The department published a graph on the change in annual rainfall comparing the rainfall from 1976 to 1999 with 2000 to 2007. This showed that most of the State had a rainfall reduction of at least 5 per cent. Some 25 per cent of the agricultural areas had a reduction of from 5 to 10 per cent and probably 15 per cent of the areas had a reduction of between 10 and 20 per cent. About 10 per cent had increases, largely in the Esperance Shire, with the eastern section having increases of more than 20 per cent.

In the period 2000–2007 department was or had been part of seven cooperative research centres (CRCs). These were Legumes in Mediterranean Agriculture, Bio-control of Vertebrate Pests, Premium Wool Quality, Quality of Wheat and Wheat Products, Weed Management Systems, Sustainable Development of Tropical Savannas and Plant-based Management of Salt Affected

Activities during 1995 to 2008

The Services Program
The Services Program was established as the department's principal Provider within the Funder, Purchaser, Provider model as part of the implementation of the 1994 portfolio review. As the Provider this program was responsible for managing almost all of Agriculture Western Australia’s scientific, technical and inspectorial staff—about 1330 of the 1650 total employees (initially). The Services Program consisted of an executive director with a line management structure which included 10 service units. Seven of the units controlled large numbers of staff in service-oriented groups. The remaining three, which were responsible for regional services, business services and special projects, operated across the department. The seven service units with large numbers of staff were divided into discipline groups and business units, each with a strategic discipline, service product and/or geographic focus. Each of the discipline groups was headed by a discipline leader. The role as the discipline leader normally took 30 per cent of the occupant’s time. Regional representation and coordination was achieved via 24 district leaders, again on a part-time basis.

During the year the program finalised project documentation and completed negotiations to undertake 370 projects with a total value of some $127 million. This proposal, which was introduced to simplify and give improvement in the overall management of the department, appears to have introduced many complexities. It was not continued beyond the change of government in 2001.

The activities listed below should be seen as indicative of the actions taken over the period and not as a definitive list.

Marketing and extension
During this period the department was the main provider in Western Australia of contracted agricultural research that examined various aspects of rotational farming, cropping and sustainability practices, plant pests and diseases and new crops and pastures. The information generated was released to farmers and agribusiness via a range of media and modern communication methods such as interactive adult learning settings and the internet. The products and information generated were enabling broadacre agriculture to have greater flexibility and agricultural biodiversity than 20 years earlier. These products involved:

- development of systems for improving market intelligence flowing to grain growers, including intelligence on the value of different qualities of wheat and methods of estimating the quality of the wheat to be delivered
- demonstration of the role of pastures in cropping systems
- investigation of all markets of interest, researching new markets and development of activities directed at improving exporters' knowledge
- joint studies with the Mid-West Labour Marketing Advisory Council and the Mid-West Development Commission on options for regionally-based processing and marketing of agricultural produce
- a display at the Dowerin machinery field days with a market focus on grain legumes, canola and Awassi sheep as alternative products for wheat farmers
- development of the Crop Check management group which brought together 12 key organisations and industry sections, drafting a business plan leading to an effective partnership between industry, the department and the commercial sector, securing endorsement of consulting groups and obtaining funding to develop a crop analysis system, instigating a radical
approach to empowering the group to manage crop analysis

- a deliberate program to improve collaboration with agricultural consultants and other agribusiness personnel. In one year a program of workshops attracted 300 attendees.

**Small landholders services**

Traditional clients had been commercial producers, but services were extended for nearly 50,000 rural landholders with small holdings, engaged in a wide range of agricultural activities, both commercial and sub-commercial. They controlled an estimated 650,000 hectares of land, often in areas of agricultural and environmental significance. To assist these landholders, the department set up an enquiry service in 2003/04 and organised field days and workshops.

Over the four years to 2007/08 it delivered and facilitated more than 150 learning events for small landholders, with more than 4000 people participating. These workshops dealt with managing stock, stock identification and animal husbandry, protecting waterways, revegetation and weed management. In April 2008 the department organised the first national small landholders extension practitioners forum.

During 2003/04 the service to clients was refined with the establishment of a dedicated telephone service for producers and consultants. This service streamlined access to the department’s products and services, covering crops, pastures, livestock, animal health, horticulture and general agricultural production. The service was known as Ag-line.

The department’s Pest and Disease Information Service responded to around 11,000 enquiries during a financial year. Staff managed the provision of assistance for farmers suffering from unpredictable events.

All of these activities were in addition to the publication of a wide range of pamphlets, brochures and booklets on major issues of concern to farmers.

**Trade and Development Program**

In 1998/99 emphasis was on the development of strategic alliances across a number of industries in Asia. Market research and feasibility studies were undertaken to assist industry with relevant information. The department also launched Focus Taiwan in November 1998 to strengthen the links between the Western Australian and Taiwan food industries.

Other activities related to efforts to increase markets for pig meat, participation with primary producers, processors and retailers in workshops and seminars and making a contribution to the Memoranda of Understanding developed between the WA Government and those of Jordan, Egypt and Taiwan.

The department also completed a pre-feasibility study for construction of a modern abattoir in the Kimberley. In the event this was not built.

The department also provided assistance to some small companies, and gave advice to a number of companies on export opportunities. Executive support was provided to the Grain Export Licensing Authority, which included advice on policy, operational procedures, the conduct of market research and analysis to assist in the assessment of applications for special export licences.

In April 2007, the Biofuel Task Force completed a report on industry activity which included research on alternative oil seeds, design of an industrial wheat breeding program, establishment of a biofuel website and the preparation of several articles. It also helped one company to establish two ethanol plants in WA with a productive capacity of 190 million litres. Each plant would require 500,000 tonnes of grain feedstock annually.

As part of its overseas activities the department won and successfully managed
a number of international training and consultancy projects in Asia and the Middle East.

It also assessed opportunities for summer fruit exports to India and the UAE and investigated the market for plums and nectarines.

Manjimup apple growers marketed red apples to India using the bulk transport technique developed by the department.

Mango exports to the UK and Europe started, with new sea freight technologies. Carnarvon growers were trying a new table grape bred by CSIRO and evaluated by the department to develop an export market.

**Wool/Live Sheep Program**

As in previous reporting the samples of departmental activities which follow are meant to be indicative and not complete records. During the period there were a number of notable successes for the program which included:

- attracting early-stage wool processing to WA
- management to ensure wool is prepared and handled in accordance with the customer’s requirements
- sale of wool through a quality assurance scheme
- development of a vaccine for lumpy wool
- research resulting in reduced death rates during export of live sheep
- development of two decision tools—‘lamb planner’ and the first of a family of tools to assist in the adoption of perennial pastures called ‘Evergraze more Meat from Perennials’; perennials were also seen as a method of reducing nutrient and water loss to aquifers
- demonstrating the value of lupin stubbles for feeding weaners over summer
- demonstrating that uniform fibre thickness was a genetic and hereditable characteristic which opened the opportunity for farmers to control feed supplies to meet pre-determined target fibre diameter
- developing groups of growers selling direct to processors to shorten the wool supply chain, coupled with in-shed testing of wool to guarantee quality
- examining the influence of variability in fibre diameter on the ease of processing of wool and the value of in-shed sampling
- development of a prediction model to estimate hauteur based on the fibre diameter profile
- modelling to determine whether it was profitable to select replacement ewes by in-shed measurement
- demonstration that felting is a heritable character and an opportunity for breeding for lower shrinkage
- establishment of a protocol for on-farm testing and selection of fleeces on the basis of fibre curvature
- testing in 2001 of new technology of feeding fungi to sheep for worm control
- preparation of models to make comparisons of prices received by growers and between different selling centres for wool of comparable characteristics
- finding that genetic resistance to worms was available in the Rylington flock
- beginning the development of measurement of pasture growth rate and availability by satellite.

The department started several collaborative studies with major overseas processors, with the aim of developing a special relationship with Western Australian wool, such as had been achieved with Indian processors. This included demonstrations of WA wool to processors, and studies of removal of contaminants. In one case there was collaboration with an Italian processor to produce a fabric designed to achieve excellent ‘next to the skin’ comfort based on in-shed testing of the raw product.
Chapter 5 – 1995 to 2008: a change of focus

The Wool Design Laboratory. The department shifted part of its research focus to post farm gate opportunities, including studies of options for the wool industries.

In Europe, collaborative studies were carried out between a major Scottish wool spinner and the WA wool industry. Professional officers visited Europe to initiate the development of partnerships; these were established with several carding, combing and spinning machinery manufacturers. A detailed technical paper showing that WA wool processed as well and at times better than predicted was presented to a major international wool conference. Experimental work was continuing on increasing wool staple strength.

On-farm evaluation projects began at the break of the 1996 season. Thirty-seven on-farm evaluations were conducted, with the aim of improving farm productivity by application of new information and the use of new pasture plants. This work continued throughout the period.

In 1998 fine fibre-end wool (autumn-shorn) was taken through to garment manufacture, and evaluation was organised through UK retailer Marks and Spencer. This program continued through the period. Wool fabric made from 'fine end' wool was released in Italy in July 2006 and received wide praise at the yarns trade fairs in Europe.

A strategy was launched to improve returns through supply chain partnerships, which meant an increase in direct marketing, to reduce the inherent costs of the multiple changes of ownership.

The department registered a provisional patent for rotor spinning of 100 per cent wool in May 1999. This followed trials with a German machinery manufacturer. Its commercial production would substantially reduce the cost of spinning. Tests reported in 2001 showed this system was commercially useable.

Processing trials with a French carding machinery manufacturer using Western Australian wool were extremely successful, pushing efficiency of throughput to a new level. Trials with spinning long hauteur wool at an overseas mill under supervision proved this type of wool could be handled satisfactorily. This should have resulted in the removal of the discount this wool experienced in the market.

On-farm work pointed to the desirability of maintaining a flat fibre diameter level throughout the season, avoiding thickening in periods of plentiful feed.

Trials at Katanning using wethers showed marked differences in production between blood lines. Wether comparison trials were carried out up to 2000.

Concerns with increasing European controls on pesticide residues in wool scours were noted.

The department was part of a group which succeeded in obtaining a new Sheep Cooperative Research Centre for Western Australia. This centre focused on improving the whole-of-garment comfort from wool, increasing the yield of meat from lambs while retaining eating quality, expanding research into control of stomach worms and establishing a nucleus flock as part of a progeny testing scheme for both wool and meat sires linked to similar flocks in other states.

Initial research into breeding breach strike-resistant Merino sheep was advanced successfully. The department has opposed mulesing and eliminated it from its animal management practices. While this could be a sound policy decision it has caused management difficulties at field level.
In a farmer-based trial comparing production within a wether flock it was shown that large differences existed between the top and bottom producers, providing an opportunity to markedly increase profitability. Feed requirements for lambing ewes were also being tested under field conditions.

At farm level new pasture species were becoming available from the breeding and selection program. During 2001/02 the department released an early maturing yellow serradella, a redlegged earth mite-resistant gland clover and a soft-seeded biserula. Seed of a hard-seeded PVR selection of French serradella was being built up.

**The Meat Program**

**Beef**

In 1999 the department, in association with Meat and Livestock Australia, decided to spend $1 million over three years to implement a national beef grading scheme called Meat Standards Australia. Industry support and cooperation were outstanding, with all sectors giving strong support.

The effect of hormone growth promotants on meat quality was investigated. Key findings were that carcase weight rose without increase in fatness, although beef from treated cattle was not as tender as untreated cattle, and marbling was reduced.

Achievements included the demonstration of successful beef production on tagasaste. This success was the basis for the promotion of tagasaste for the sandplain soils of the West Midlands where pasture plants struggle to provide satisfactory grazing. The use of tagasaste in the farming system for both sheep and cattle was being developed.

In 2001 work to examine the feasibility of lot feeding beef on the western sandplain, central wheatbelt and Esperance was reported. Other work showed that supplementation of steers and heifers with home-grown grain produced economic benefits from cattle grazing perennial grasses in the Esperance region.

Research also suggested shifting calving time from autumn to winter could be an advantage.

It was noted that experimental work was still proceeding on fattening pastoral cattle on irrigated leucaena in the Kimberley.

Experiments and demonstrations with controlled grazing of beef cattle in the South West showed that stocking rates could be increased by up to 30 per cent. The potential increase in production came from the transfer of technology from the dairy industry. This involved the use of nitrogen fertiliser, conservation of the spring flush and possibly some finishing with grain supplements. A hindrance to adoption of this program was the market power of the supermarkets and the absence of firm contracts to encourage the necessary investment.

There was also a focus on the use of perennial legumes for increased production and higher water use in the higher rainfall zone. The use of kikuyu was being promoted. As in the other programs a network of international scientific contacts in countries with similar climatic conditions was established.

A Singapore Beef Alliance was formed by the cold storage supermarkets, wholesalers and producers to promote premium quality Western Australian beef under the brand name of ‘Nature’s Choice’ for the South-East Asian supermarket trade.

Work on the efficiency of conversion of feed showed that all beef herds had a range of efficiency from which to select. Feed intake was an important selection criterion because it had been shown to be independent of growth rate. Selection for efficiency was a major way to reduce the feed costs of fattening steers. The saving could amount to $65 per head.

It was shown that glycogen, not pH, was the indicator of dark cutting meat. Therefore steers should be kept on a high plane of
nutrition before slaughter to ensure an adequate level of glycogen in their systems. The work also showed that feedlot steers could be transported for up to 10 hours and still maintain high levels of glycogen. The department completed work on the establishment of objective benchmarks that described consumer perception of meat colour during shelf displays.

The use of virginiomycin to prevent problems related to gram-positive bacteria when grain alone was fed to cattle was potentially important to the feedlot industry.

It was shown that the dropped ovary pregnancy control technique was potentially valuable in the Kimberley.

It was reported that strategic alliances for live cattle export had been established. Work was also carried out to ensure higher standards of animal welfare in the trade. Investigations were in progress to reduce the ammonia level on ships exporting live cattle.

The department carried out a large beef project investigating maternal productivity of beef cows at the Vasse Research Centre. This was one of only two locations as part of the work of the Beef Cooperative Research Centre. A project involving 200 beef cattle, investigating the function of genes in controlling post-mortem tenderisation of beef had been completed.

**Pigs**

It was reported that a pig production system based on all-in, all-out and a straw-based low-cost housing system had performed better than conventional systems.

Research into pork eating quality was in progress. Work to modify pork products to match the needs of the Singapore market was also undertaken in 2001.

Work showed that the copper and zinc load in effluent from grower/finisher pigs could be reduced by 70 per cent without affecting output, by using Bioplex minerals instead of the less expensive inorganic product.

**Sheep and goats**

Five meat breeds were introduced from South Africa: Dorpa, white Dorpa, South African Meat Merino, Dohne and Africaner. These new sheep breeds were being tested for suitability for the pastoral areas in 2001. The department participated in a national program to develop standards for eating quality of both sheep and pig meat to parallel the work done with beef.

The requirements of potential export customers for live sheep appeared to have been met with the implementation of a successful scabby mouth vaccination campaign. This resulted in a significant reduction in this problem in live sheep unloaded at export destinations.

The first commercial export of Awassi-cross lambs was reported in the late 1990s, as the introductions came out of quarantine. Another first was the shipment in the late 1990s of first-cross Boer goats from Winderie station at Gascoyne Junction to Malaysia, to demonstrate the superior growth rates, quality and lower mortality of the Boer-cross domesticated progeny. A promotion was also held in Kuala Lumpur to create awareness of WA goat meat. This program continued through the period, with record shipments reported in 2000. This work also showed that goats did not cause the anticipated damage to vegetation.

Dogs continued to be a major problem of small animal production in the pastoral country.

Interest in cashmere did not continue. Selection for cashmere production was continued at the University of WA farm at Allendale and higher yielding goats were developed.

Planning was proceeding to replace the Midland stock saleyards, with the establishment of the new yards at Muchea.
Chapter 5 – 1995 to 2008: a change of focus

**Dairy and Apiculture Program**

Feed for dairy cows which produce throughout the year is a high cost, particularly on dryland farms over summer and autumn. For this reason the program focused on reducing the cost of the nutrition from before 1996/97. The aim was to reduce the cost, which amounted to about 30 per cent of total income at that time, and to increase stocking rates in order to increase profits. The work at Vasse Research Station helped farmers get better value from their pastures.

It was part of the overall industry focus on increased intensification of the livestock industries, associated with increased cropping and reduced areas and the opportunity to use lot feeding systems for finishing livestock.

A ‘protein plus’ program improved the milk protein received by processors. Collaborative work with CSIRO and the University of Queensland and others showed that time of calving, length of lactation and summer feeding were all factors affecting protein levels.

Some bacterial spores were shown to be resistant to ultra-high temperature treatment and investigations were started to identify their nature and source. While the level appeared to vary seasonally, some farm supplies consistently contained more spores than others. Since the spores appeared to originate from the teats during milking, careful washing and drying was tested and it reduced contamination by 70 to 80 per cent.

A bacterial identification service established on a cost recovery basis for producers with bacterial counts in their milk above the premium level was used by half of producers. An automated bacterial counting device installed by the Dairy Industry Authority allowed rapid tests.

Later the authority was abolished as part of the dairy privatisation program across Australia. Control of milk quality became the responsibility of the companies, who used price penalties to maintain quality. The department collaborated with De Laval Pty Ltd to assess the practicability of pre-milking sanitisation of teats. Pre-milking treatment improved shed and milk hygiene in summer and autumn.

A nutrient strategy, ‘Dairy Catch’, was developed for waste management on dairy farms and tested on four commercial farms. Pasture research directed at increasing the utilisation of paddock feed and decreasing waste was set up at the Vasse Research Station to study pasture utilisation on dryland dairy farms. The future dairy industry could well be on dryland farms south of Busselton, where underground water is available for sprinkler irrigation of summer pastures.

During 2008 the Minister for Agriculture opened the department's new dairy research facility at the Vasse Research Centre in Busselton.

A dairy pasture utilisation and production project was completed, with 86 per cent of surveyed producers rating the project as successful in helping to improve production. The productivity and persistence of new legume species (Caprera crimson clover and Cefau arrow-leaved clover) had been demonstrated. A book on perennial pastures for Western Australia, released in June 2007, detailed the current state of knowledge and prospects for perennial pastures in Western Australia. Three new pasture legume cultivars were also released.

A review of dairy industry legislation was completed in accordance with the national competition policy reform. The industry was deregulated in 2000 and the government offered a $27 million assistance scheme to help farmers adjust and to help develop markets for the dairy manufacturing industry.

**Cereal Program**

The change to the cropping system and increased information about market requirements and opportunities for accessing niche markets with specific quality requirements focused the Cereal Program on time of maturity and specific qualities as
well as disease resistance and yield. Fortunately, due to the reorganisation in the 1970s, coupled with substantial improvement in facilities since, there was capacity to cope with these new challenges, which involved matching grain quality to end users’ requirements. During the period 11 new wheat varieties, three new oats and a new feed barley were released from the breeding program.

These were in addition to the wheat varieties Eagle Rock and Tammarin Rock, and the malting barley Hamelin which were released separately. Details are given in Chapter 7. The German company BASF produced two back-crosses of wheat varieties with added resistance to herbicide. Collaboration with the CRCs for Molecular Plant Breeding and for Value Added Wheat and with the Murdoch University led to a Centre of Excellence titled ‘The Centre for High Throughput Genetic Analysis’, enabled the department to establish a joint centre for the state of the art of high throughput molecular screening for its grain breeding programs.

Triticale was being examined as a significant stockfeed. The possibility of a durum wheat industry being developed was also examined.

A number of other actions guided the breeding program. Some of these were:

- hosting a group of Japanese wheat experts to the cereal laboratory to improve their knowledge of Western Australian grain products
- arranging for three staff to work in Singapore for 10 days to obtain an insight into Asian food products
- organising an expert to visit commercial processors and plant breeding organisations in the United States and Canada, to gain a better understanding of the quality requirements of oats for human consumption. This provided the base to breed cereals which the market wanted
- arranging to collaborate with the CRC for Wheat Quality in a study of potential for on-farm quality assurance
- promoting the importance of wheat quality to producers at a series of seminars, attended by 1000 growers
- development by the Cereal Laboratory of a simple test to characterise starch quality, to be used for selection of wheat varieties for noodle production
- researchers at the biotechnology centre identified a gene marker to assist in the selection of varieties with improved quality for Asian noodles
- research showed that a non-host crop would significantly reduce the number of cereal cyst nematodes in one season even where initial numbers were very high; these were more effective than resistant cereal crops.

The new production technology introduced during the late 1970s and early 1980s resulted in Western Australia’s average crop yield increasing at around 50 kilograms per hectare per year over the 1990s. The Cereal Program was also promoting packages to help growers to produce hard wheat, Udon noodles, soft wheat and malting barley.

Overseas visitors testing noodles. Cereal Chemist Graham Crosbie is second from right. The wheat breeding program had shifted focus to breeding to meet market needs.

Research had shown that significant benefits to cereal grain yield and protein content were available from well-managed medic pastures on medium and heavy soils in medium to low
rainfall areas. In 2002 two new wheat varieties, Wyalkatchem and Harrismith, were released.

New global developments in research technology were adopted together with the use of genetic engineering and biotechnology to advance the breeding program. The double haploid technique was adopted to help the cereal breeding program, and marker-assisted selection was also used to identify promising crop crossbreds having desired characteristics.

The statement was made that “The main reason for Western Australia’s relatively high rate of productivity improvement was that its agriculture was dominated by grain production, which improved significantly over the decade. Several factors have contributed to rapid growth, including new crop varieties, new rotational and cropping practices and improved crop technology. More rapid varietal assessment and selection was aided by the development of near infra red (NIR) grain quality assessment and the development of grain markers linked to important breeding attributes”.

Agriculture WA was the main provider of new varieties for many crops and through its lead association with the Centre for Legumes in Mediterranean Agriculture (CLIMA), also of new varieties of lentils and Lathyrus.

Agronomic work included the use of gypsum on difficult grey clays, managing pastures in phase farming, the further use of raised beds for waterlogged areas, and studies of stubble management.

The department released an electronic directory ‘Tools to Assist Decision-making’ on its website to provide farmers and advisers with 40 tools for decision-making on various aspects of farming.

Work focused on weed control strategies in 2001 to counter the development of herbicide resistance. In 2007 a new publication Integrated Weed Management in Australian Cropping Systems—a training resource for farm advisers was released. Early in the period researchers confirmed that wild radish had joined ryegrass and wild oats as having resistance to a range of herbicides. Although it was aimed at Western Australia the publication became a national tool.

A rust outbreak in 2000 provided an opportunity to measure the value of spraying as a control technique.

Four global models of low rainfall, resulting from studies of climate change, were compared in terms of simulated monthly rainfall and maximum and minimum temperatures for eight selected locations in the grain belt. The simulated future yields showed a yield decline in most locations. Some yield increases were observed in some higher rainfall locations due to the combined effects of increased carbon dioxide and reduced waterlogging.

In 2000 it was reported that an El-Nino prediction index and a Southern Oscillation index had been developed to provide more accurate indications of the likelihood of major droughts and favourable seasons.

Information of the impact of a dry season was produced for all levels of government. A poor year in 2002 resulted in adverse circumstances assistance being administered.

Grain Legumes and Pulses Program

Work continued on a range of programs through the period. Highlights were:

Early spraying with a synthetic pyrethroid was shown to be successful in control of aphids and gave excellent control of cereal yellow dwarf virus disease, with a yield response of 1.5 tonnes per hectare of wheat and 2 tonnes per hectare of oats.

There was dramatic expansion in canola production from the 33 000 hectares sown in 1993 to 800 000 ha in 1999. Best practice was vigorously extended to the industry. A program was developed to produce specialty oil canola with high oleic and low linoleic acid. The department cooperated with international organisations in the development. The canola breeding program
was passed on to the University of WA later in the period.

The pulse group was proactive in adopting quality assurance approaches as a basis for promotion of supply from WA to new markets, particularly India.

An outbreak of anthracnose in lupin crops in the northern grain growing areas resulted in 130 properties being placed in quarantine. Anthracnose resistance was identified through testing in New Zealand, resulting in early release of a resistant high yielding variety.

A joint venture between Cooperative Bulk Handling and George Weston Foods to build a processing facility provided opportunities for developing lupin products for the food industry.

The department developed prototype lupin milk and other dairy substitutes and was negotiating to find a partner to commercialise the products. They were considered superior to comparable soy products. No partner had been found to the end of the period.

The lupin breeding program produced a number of new varieties. Kalya a new high yielding anthracnose resistant variety of sweet lupin with a 5 to 15 per cent yield advantage over Gungurru was released during 1996. A new narrow-leaved lupin variety named Coromup was also released; it had higher protein than other available varieties and was targeted at the dehulling and protein market.

It was demonstrated that eating lupin-enriched bread increased the satiety and reduced energy intake in humans. This work, done in association with the new Western Australian Centre for Food and Genomic medicine, contributed to a significant medical publication which stimulated commercial interest in lupin flour from a major US food company.

Lupin seed gave outstanding results when whole seed was incorporated in fin fish diets. In 2000 the department was promoting the benefits of lupin and canola meal for aquaculture in Taiwan and China.

The first Australian release of an early flowering yellow lupin (Wodjil) was made. In 2000, early flowering L. albus was being built up. In 1997 a fully domesticated line of L. atlanticus was built up for testing. In 2003 these world first fully domesticated Lupinus atlanticus lines were tested in the field.

In 2002 the program was aided by the introduction of new technology to produce varieties with thinner hulls.

The first chickpea varieties were released in a joint program with New Zealand's Crop and Food Research Institute.

The development of Kaspar field peas, from Victoria, was a major advance. Kaspar is upright and easy to harvest. The release of two field peas for higher rainfall production areas had been positive for the industry but Kaspar was now expected to dominate as it outperformed Dunwa, which was released in 2002. Material resistant to black spot was identified and attempts were being made to have it introduced into the genome.

Two new lentil varieties were commercialised.

There was an increased focus on the need for lime in some soils which had developed increased acid levels, particularly for growing some pulses and oilseeds.

The genetic modification of lupins to transfer pesticide resistance into breeding lines was carried out in partnership with CLIMA. CLIMA had become the world’s leading centre for molecular biology of legumes. Partnerships were also entered into with other organisations to achieve access to specific skills or materials.

Some 300 tonnes of Cadiz serradella seed were produced during 1997/98. It was the most widely sown pasture seed in the 350 to 700 mm rainfall zone.

In 2000 there was interest in attracting investment in a biodiesel industry.

In 2000, new early triazine-tolerant, blackleg-tolerant canolas were showing high potential. WA lines had higher yields and higher oil and protein content than others tested. Another line had 65 per cent oleic and 24 per
cent linoleic oils. Fungicide treatment of seed was shown to be effective in controlling blackleg. In 2002 modelling of canola to forecast blackleg spore showers was developed.

Widely spaced rows and shielded sprays gave a 98 per cent control of ryegrass in lupins, with major advantages for the following wheat crop.

The first chickpeas were exported from south-western WA.

The department continued to be active with information, investigation and advice activities under this program.

**Horticulture Program**

The department serviced the fast-growing horticultural industries, which had a gross value of production of around $500 million. One-third of this amount was derived from exports. Vegetables contributed nearly half of the gross value of production, fruit 26 per cent, floriculture industries 22 per cent and wine 5 per cent. It was believed that exports would continue to grow strongly in the next decade.

Some main developments have been:

- the selection of a new fresh market potato, Nadine, after more than five years of testing. Nadine made strong inroads into the market with even, attractive tubers, free from blemish, and good resistance to disease. It also yielded better than Delaware, producing 10 per cent more premium grade tubers and up to 25 per cent more total yield
- unveiling of a new and improved cream-skinned fresh market potato variety called White Star during 2007/08. White Star should provide agronomic and profit gains for growers, and retail testing indicated 43 per cent of customers rated its appearance as excellent
- carrot exports increased with 53,000 tonnes exported in 2000/01
- increased mango production and new varieties were being developed
- wine grapes were planted at Welstead, Many Peaks and Bremer Bay at a density of 2222 vines per hectare
- application of new techniques to the management of Japanese grape varieties gave a berry size which was 50 per cent larger than in previous seasons. This was attractive and should open access to the Chinese market
- a superior strawberry variety developed in Victoria was being tested and commercialised in 2002
- export of crisping potatoes to Malaysia reached 6000 tonnes a year. The department was discussing these with Indonesian importers
- research on fertiliser leaching to the groundwater continued, with advice to growers being an important component
- a system allowing sea freight for mangoes from Kununurra to Asia was successfully developed and adopted by industry
- the possibilities for exporting lettuce to South-East Asia and the Middle East and seed potatoes to Vietnam were investigated. Cavity spot in export carrots was solved through better management packages.

The establishment of the Centre for Australian Plants was a new venture for floriculture. It brought together agencies and institutions for the domestic and international flower, foliage, pot plant and amenity plant markets.

Two new varieties of Geraldton wax—Jurien Bay and Esperance—were released. The department began a biotechnology program in floriculture with native species. The initial focus was on the mechanisms controlling flower colour. A world-first innovative plant tissue culturing system was developed to propagate plants which had proved hard to propagate, such as smokebush and the Qualup bell. Eleven varieties were released.

Apple exports continued to grow with a new vigour, driven by new varieties such as Pink
Lady™, Sundowner™ and Lady Williams, which were all developed here. A quality assurance program for the industry was developed, with the involvement of the apple producers and packers. The export value of Pink Lady™ and Sundowner™ apples had grown to $7 million in 1997/98. In 2007/08 the department also released the first non-browning apple, called Enchanted™. Five further apple selections were granted provisional PVR registration.

The viticulture industry had a problem with obtaining good quality propagation material that was true to type and had known disease status. Agriculture WA helped to establish the Western Australian Vine Improvement Association to address this problem. The association established a source of stocks in all regions and quality management procedures to collect, treat, allocate and distribute 300,000 propagation units during the year. A high quality source was also established on Manjimup Research Station. Knowledge of vine fertiliser requirements was greatly improved by the department's work and a manual, *Fertilisers for Wine Grapes*, was developed.

During 2007/08 the department concluded a world-first scientific study which proved that smoke affected the taste of wine grapes and subsequently the wine made from those grapes. This work was done as a result of burns and bushfires in growing areas. The study was of great interest to the Californian and South American wine industries.

Irrigation practices on wine grapes were revolutionised with the demonstration and adoption of regulated deficit irrigation practices. This involved stressing the vine during the growth phases and applying adequate water during berry development.

Downy mildew had occurred for the first time on vines and the department was heavily involved in efforts to stop it from establishing in WA.

Over 60 new varieties of wine grapes were imported from the eastern states. This was aimed at ensuring WA had access to the best planting material available.

In 2002 a 10-year research and development project to establish table grapes in the north was successful when Carnarvon produced $6 million worth of grapes, with exports worth $750,000.

Banana production expanded, with 60 per cent of produce coming from Carnarvon and 40 per cent from Kununurra. Techniques had been developed for manipulating the timing of fruiting. Irrigation trials optimised soil moisture contents in the Ord. Appropriate plant density was also clarified.

An examination of the opportunities for the citrus industry indicated there was a significant opportunity for increased production.

There was also interest in identifying markets for organically-grown products.

Work on the use of cold treatment to satisfy Japanese quarantine requirements for imported red-fleshed grapefruit was successful and new protocols for imported citrus were accepted by Japan.

Cotton production and management guidelines for the use of GM cotton on the Ord River Irrigation Area were developed.

The vegetablesWA website was developed in a partnership between the department, the Swan Catchment Council and the Premier’s Water Foundation as a medium for providing growers with access to information and an interactive on-line support for irrigation management.

In 2001 the department developed an export cauliflower plan which was adopted by industry. Research reduced the cost of production by 50 per cent, which offset rising costs. It also developed a fertiliser regime which excluded fowl manure, which had been banned for eight months of the year.

A major project was in place to address the requirements for production of horticultural crops on the Gnangara Mound. The aims were to reduce irrigation water use and minimise nutrient leaching. A good practice guide focusing on nutrient and water management for the Swan Coastal Plain was published by vegetablesWA in association
with the department. The publication aimed to improve grower profitability and reduce impacts on the environment.

The department was also developing innovative practices for reducing nutrient losses to groundwater associated with the irrigation of leafy and heading vegetables. Research indicated that vegetable yields can be tripled by a strategic application of mineral fertilisers, with reduced water application.

Strawberry production increased and there were significant exports, with a focus on improved quality, nutrition and handling.

**Food – an expanding program**

The development of a Food Program began in 2002 when an officer with a background in the food industry was recruited. This development was driven by a conviction that there was a real opportunity to provide greater value to the agricultural industries through work beyond the farm gate than through some on-farm work. However, the department did not officially become the Department of Agriculture and Food until 2006.

From 2002 to 2006 there had been considerable conflict with other departments on whether the Department of Agriculture had a role in the food industry. During this period the department developed its capacity to contribute, as is reflected in some of the issues worked on before 2006.

In 2008 considerable work continued in determining the best way to move forward in partnership with industry. A Food Industry Development Plan was developed and submitted to Cabinet immediately before the change of government. It had the support of other departments but was not considered due to the decision to call the 2008 election early. Some food-related issues addressed by the department during the period were:

- It helped reduce the burden of the food regulatory environment, providing input to the national debate on topics such as fortification of foods and origin labelling. It coordinated 60 Western Australian companies in showing at major international trade fairs.
- The Safe Food to Quality system (SFQ 2000) was expanded and more than 600 Australian agribusinesses were certified under the system.
- Work was done to eliminate the 'boar taint' from large pig carcases.
- Feeding trials indicated that feeding protected sulphur amino acids improved the quality of meat and the profitability of prime lamb production.
- Investigations into markets for manufactured products from the dairy industry were started.
- The dairy industry agreed to a system of quality assurance for dairy production and a quality assurance system for farm production, which was tested on about 45 pilot farms.
- The department's R&D (research and development) capacity was enhanced by the initiation of an alliance with Food Science Australia and establishment of Food-Net solutions.
- The creation and implementation of the Buy West, Eat Best program which encouraged the presence of local products in supermarkets.
Chapter 5 – 1995 to 2008: a change of focus

Launch of the Buy West, Eat Best campaign. As part of its focus on market opportunities the department assisted with this campaign.

**Disease Control/Biosecurity Program**

Endemic disease and pest control has historically been an important part of the department’s activities. The Biosecurity Program is associated with barrier, quarantine and export standards, surveillance and preparedness, plant pest and disease eradication and control, animal disease eradication and control, vertebrate pests, resource protection and product support.

A significant issue was the requirement of the Uruguay Round that countries belonging to the General Agreement on Tariffs and Trade should show that quarantine provisions are not used as unreasonable barriers to trade.

An office of the Chief Veterinary Officer was established to service the needs of internal and external customers in relation to issues of animal health identification and disease control.

In 2003/04 the department took on a greater role in animal welfare, particularly in improving welfare for livestock.

The management of chemical residues continued, although it had been 10 years since the original market problem occurred.

Detector dogs and the Rapi-scan X-ray machine, coupled with road checkpoints, were important in the quarantine program.

Like other programs, quarantine and pest and disease control has continued. It brought a number of important results including:

- biological control of ARGT was successfully demonstrated in 1995/96 in field plots, using a fungus, *Dilophospora alopecuris*
- an effective response to the anthracnose disease outbreak in lupins
- successful implementation of WA’s component of the National Brucellosis and Tuberculosis Eradication Campaign
- continued implementation of the footrot eradication campaign
- the eradication of apple scab and identification of a new outbreak
- the introduction of Paterson’s curse control agents into the field
- progress with biological control of mesquite
- control of bee diseases
- the effective management of the animal disease diagnostic service
- the recognition of the Albany footrot laboratory as the Australian national reference laboratory. The number of properties under quarantine for virulent footrot increased from 48 to 58 during 1998/99, largely on abattoir surveillance. The industry agreed that sheep producers would provide the majority of funding and manage the footrot control program
Chapter 5 – 1995 to 2008: a change of focus

- emergency response capacity was strengthened through planning and training and the contribution of the department to crises such as the Esperance fires and floods, Moora floods and cyclone damage in the Gascoyne-Murchison regions
- effectively dealing with outbreaks of mildew in grapes, chalk brood in bees, sugarcane smut and a mice plague, which resulted in commendation of the department's performance
- development of a wheat industry protection action plan to minimise the risk of damage from exotic pests and weeds, diseases and pesticide residues
- drafting an industry protection and action plan with the wine grape, table grape and dried fruits industry
- accreditation of the Western Australian Animal Health Laboratory by the National Association of Testing Authorities (NATA) and continued provision of effective diagnostic capacity for a wide range of animal diseases
- participation in a national surveillance program for transmissible spongiform encephalopathy (TSE) which began in 1998. Coupled with the ban on feeding of mammalian protein to ruminants, this maintained Australia's access to markets which require TSE freedom
- agreement to cost-sharing arrangements which were developed for national pest and disease incursions. The department supported the development of the Australian Plant Health Council to lead the planning and responses to the increasing range of serious plant pests and health challenges facing Australia's plant industries
- continued provision of international quarantine and export services across WA under an arrangement with the Australian Quarantine and Inspection Service
- interstate quarantine inspections at permanent checkpoints at the State border at Kununurra and Eucla and through a mobile checkpoint. Almost 85,000 vehicles were checked, with 45,000 seizures, principally of fruit and vegetables, plants and honey
- operating detector dogs at the Perth Domestic Airport, at over 11,000 flights carrying over 1.2 million passengers. The Rapi-scan X-ray machine allowed scanning of an increased number of interstate and international parcels. This resulted in significant increases in the interceptions of seed consignments entering Western Australia from interstate

Border security: Sniffer dog at work at Perth Airport.

- imposing intrastate restrictions on the movement of stone fruit and citrus into the Ord River Irrigation Area to protect the area’s freedom from Mediterranean fruit fly
- strengthening of the program in 1998 through funding of $3.5 million to boost interstate quarantine, to enable better protection for agriculture through activities such as regional surveillance coordination, extra quarantine detector dogs and a Rapi-scan X-ray technology at Australia Post's parcel post centre, plus a number of regulatory activities, including an improved risk assessment, removal of neglected orchards and development of a Mediterranean fruit fly eradication strategy
• continued association with CSIRO and others to develop integrated pest control for Paterson’s curse, cape tulip, blackberry, mesquite and parkinsonia

The department conducted extensive inspections for declared pests. Some issues addressed were:

• incursions of the European wasp and Khapra beetle were eliminated and other exotic pests were excluded

• starlings were successfully targeted and removed from South Coast areas west of Esperance

• surveys showed that the Kimberley area was free of important agricultural pests and animal and plant diseases

• a list of pests of greatest concern to Western Australia was compiled and relevant literature on their identification, control and eradication was accumulated

• the partnership adopted by the Agriculture Protection Board with the slogan ‘Protecting Agriculture is Everyone’s Business’ was launched

• arrangement made for 16 private companies to undertake the inspection of empty containers for contaminants before they were loaded with export goods

• amendments to the plant diseases regulations provided for interstate imports from firms with a certificate of assurance agreement based on auditable quality control

• eleven quarantine displays were mounted at agricultural and travel shows

• professional staff worked tirelessly to keep equine influenza out of Western Australia.

The rainbow lorikeet, an introduced pest that harms crops and native flora and fauna, was attacked by volunteers and organisations who removed more than 6500 wild birds from the Metropolitan Area.

In a world-first, detector dogs were employed to detect European house borer in suburban houses. This was regarded as an important scientific development. The program was staffed by two handlers and two dogs.

During 2007/08 the Australian plague locust control program covered 32 500 ha.

In 2007/08 the department was working with industry to enhance the State’s reputation as a preferred supplier of safe quality food. It was developing two major whole-of-government strategies, one for food and another for biosecurity, in conjunction with other agencies. It anticipated playing an increasing role in animal welfare. These initiatives were focused on community demand for greater evidence of plant and animal health status, including freedom from specific diseases, pests and chemical residues.

During 2007 the Biosecurity and Agriculture Management Act (BAM Act) was passed. This is an important piece of legislation which improves the ability of the State to manage, prevent and contain biosecurity risks, including pest plants and animals as well as diseases.

The Eucla checkpoint. Prevention of the introduction of pest species was an important part of the department’s work from its earliest days.
The department enhanced the biosecurity team of inspectors and detector dogs and launched the new look Quarantine WA (QWA). During 2007/08 the Quarantine WA team checked around 14,500 vehicles entering WA via Eucla and Kununurra checkpoints and confiscated nearly 25,000 kg of quarantine risk material.

**Rangeland Management Program**

The overall thrust of the department’s activity was the promotion of the concept of improved land management through the Land Conservation Development Committees and focusing on increased profitability through restructuring. However, during this period the Environmental Protection Authority issued a position paper entitled *Sustainability in the Rangelands of WA*. The department advised that it favoured an approach which included:

- a whole-of-government policy statement
- implementation of the National Strategy on Rangeland Management
- established environmental objectives standards
- specific delegation under the *EPA Act* to the Pastoral Board and the Commissioner for Soil Conservation.

Two significant contributions were made to the management of pastoral areas in the Kimberley. The first was the development of a business plan for the beef industry, based on changed herd management. Experimental work had shown that weaning of calves resulted in greater survival and a higher fecundity of females. The calves could be sent south for development and finishing or retained for sale at younger age as steers.

The department also demonstrated the value of irrigated Leucaena for fattening young stock from early weaning. The plan aimed at changing the turn-off from five-year-old steers to younger animals in order to increase the breeding herd and the gross income of the stations. This plan became the leading focus of the Kimberley beef industry development team for education and training at its September 1994 meeting. There was some adoption of the plan by the end of the period but this was relatively slow.

In association with the Kimberley Beef Research Committee and supported by Meat and Livestock Australia, the department developed a grazing land management package for the Kimberley Region aimed at maintaining and using pastures during highest value. A report on diet quality and performance of grazing cattle in northern WA was also submitted to Meat and Livestock Australia. The project reported on changes in body condition of breeder cattle grazed on pastures in the Pilbara and Kimberley over three years. A landcare teacher’s resource kit was also developed for the Kimberley.

The department established close collaboration with indigenous pastoral lessees. Management support projects were established with five of the 14 indigenous-owned properties in the Kimberley.

The department developed an employment program with an Aboriginal employment group to develop contract teams to service the mustering, feral animal eradication and pastoral rangeland monitoring needs of the Gascoyne.

Management plans were developed in the southern pastoral areas and live cattle exports from these areas were promoted.

Major rangeland surveys were completed in the Murchison and the north-eastern Goldfields.

Methods of achieving more even grazing across pastoral lands were investigated, including satellite imagery to provide information on which improved rangeland management could be based. An arrangement was also made in association with CSIRO to bolster the research effort in southern rangelands. This involved, among other initiatives, the use of GPS to trace cattle and sheep grazing movements.

Improved knowledge of landscape and rumen ecology was extended to the industry so that pastoralists would have a sounder
basis on which to redesign livestock production systems.
A $450 000 total grazing control project was funded at Winderie station in the Carnarvon area to examine the impact of goats on the environment and to measure their productivity, particularly for meat production. This demonstration was to be the basis for considering the feasibility of a goat meat industry in the southern pastoral areas.

In 2006/07 the department was developing a program for new opportunities for tropical and pastoral agriculture. This project identified opportunities for expanded agricultural and pastoral development in the west Kimberley. These included a re-examination of the opportunities for intensive agriculture south-east of Broome, based on the use of underground water supplies.

The Carnarvon artesian basin was successfully rehabilitated during the period by closing off bores, which resulted in rising pressures in the artesian field. The department completed a drilling program to prove the water resources of both the proposed Meda and Brickhouse horticultural precincts. The estimated total amount of water available for other uses as a result of closing the bores was 100 GL annually. A detailed examination was being made of possible uses for the saved artesian water. At the end of the period the project was still under consideration.

The department’s publication Pastoral Stock Water Workbook was accepted as an important contribution to infrastructure development for the northern beef industry; it will be republished by Meat and Livestock Australia.

New Industry Development Program

Under the new industry development component a Centre for New Industry Development was established. In this context a number of industries were referred to as ‘emerging’. These were cocoa, poppies, organic farming, olives, camels, green tea, pharmaceuticals in clover, bamboo, bush foods and rice. It was reported that both cotton and sugar were now regarded as developed industries in WA and would be considered under the Horticulture Program in future.

The aquaculture industry was also seen as developed and would now fall under the Sustainable Rural Development Program. The relative efficiency of the olive industry was assessed in association with the Department of Commerce and Trade. Some work was also done on the water requirements of olives.

Opportunities for a pistachio industry were examined in the wheatbelt.

The possibility of a grain-fed beef industry in the wheatbelt was considered.

There was continued interest in the development of pharmaceuticals from native flora.

Ord River rice potential was discussed with the national body.

Trade and Development Program

A range of initiatives was undertaken, including follow-up on markets for fishery and food products in Egypt and Jordan, assistance to the pig industry with exports to Singapore, help to cattle exporters in obtaining new markets, negotiating improved cool chain arrangements for fresh horticultural exports, participation in the Taiwan Food Show to consolidate market share, and hosting visits from importing countries to assist in identifying importers’ needs and to display WA products.

In 2002 this program involved with promotion of Margaret River products in Singapore, developing a stronger relationship with Taiwan’s agriculture and food industries and follow-up with the Middle East market development. A number of major market research reports were produced and Moore River olive growers were assisted with the production of a pre-feasibility report on establishment of a processing plant.

Contacts were made to clarify shelf life of vacuum-packed meat products and to
identify further opportunities for canola sales in Dubai and possibly Saudi Arabia. There was also interest in a Middle Eastern country investing in a milk processing plant.

In Japan, the department supported the approval of lupins as a human food, resulting in a soy/lupin sauce being prepared.

In the UK and Europe pig producers were encouraged to invest in WA. One producer established a piggery at Beverley.

In 2004 the department facilitated a $2.5 million investment by a Japanese company in a starch and gluten factory, as well as further development by the UK in pig production valued at $1 million. It supported 50 agrifood companies in a major international trade fair at Dubai. It also assisted with the establishment of a new State trade and investment office in South Korea. It won and managed a number of projects in Asia and the Middle East.

Natural Resource Management Program

Soil conservation had been a priority of the department since the 1940s when the original Soil Conservation Act was enacted. Soil conservation staff had received little community support for many years despite being committed to achieving important outcomes. Community interest and support only really surfaced in the early 1980s following the major 1983 drought in NSW and northern Victoria resulting in a major dust storm over Melbourne.

As the commitment to soil conservation and rangeland management became a demand for sustainable land use, the department provided leadership in the development and adoption of sustainable land management practices. This was initially achieved through promotion of the landcare movement from the early 1980s. This had involved the establishment and support of the Land Conservation and Development Committees (LCDCs). As the programs matured through the 1990s the focus shifted to whole catchments and/or sub-catchments. This resulted in the closing down of many LCDCs in the late 1990s and early 2000s.

In the mid-1980s the State and Commonwealth Governments agreed that development in rural Australia should be based on ecologically sustainable development principles which aimed to maximise economic and social benefits while preserving options for the future. Rural people had demonstrated that they were strongly committed to landcare principles and they expected to participate as communities in land use planning and management at catchment and local levels. A number of shires appointed community landcare coordinators. Some exceptional circumstances assistance was needed in some areas to allow natural resource management programs to continue. The South Coast needed this assistance in the early years due to unseasonably strong winds, exacerbating dry conditions.

Cropping, with the historical need for ploughing and in some places bare fallowing, was always the major source of soil degradation and often soil loss. Almost in parallel with the developing demand for sustainable land use, the cropping system moved into a new era. The advent of herbicides which could control weeds selectively and effectively resulted in farmers being able to control weeds without cultivation. This drove the move, initially, towards reduced tillage and then to minimum tillage. The final development of one-pass planting almost eliminated the exposure of the soil to wind and water erosion.

At the same time it allowed farmers to seed earlier to maximise the use of rainfall. The practice of continuous cropping developed, which meant that deeper-rooted plants were established, growing longer. These developments had a major effect on the amount of water escaping the root zone. Coupled with the onset of climate change they have, without doubt, reduced the rate of development of dryland salinity. How much reduction and over what period will only become apparent over time.
A 'Farming for the Future' initiative completed the identification and documentation of a generic baseline of agricultural management practices. This was to be used by the agricultural industries to assess, verify and improve sustainability. Using these criteria, assessments of the Geographe Bay and Ellenbrook catchments were completed. These included the collation of information on the adoption of management practices to reduce nutrient export. Considerable work was also done on studies and assessment of surface water structures as a basis for water conservation.

A Gascoyne/Murchison regional strategy was prepared, following extensive consultation and the development of a range of initiatives to deal with the decade-long downturn in economic conditions. The strategy included economic and structural adjustment, land use management, regional development including diversification of enterprises, environmental protection to achieve adequate representation of ecosystems in reserves, and improved social infrastructure.

Within this initiative a program for coherent property business management and planning was established by integrating a focus on farm business planning and implementation, and training in business skills by the Rural Adjustment Scheme with a sustainability rural program initiated by the Commonwealth Government. This and other initiatives dealt with both the environmental and financial sustainability of producers, with the program delivering funding and support to enhance the business skills and abilities of primary producers. There was also assistance to enhance the capacity and willingness of communities to be involved in community development in rural areas.

Under the general heading of ‘Doing More with Agriculture’, a range of programs within regions aimed at the development of leaders within the rural community and developing the capacity for them to manage social and economic change. This included building self-management of marketing. There was also a secondary objective of building the capacity in the private consulting finance and training sectors to deliver an expanded program over four years, while evaluating prospects for market-driven training in the long term.

In the period from 1995 to 2008 the Government issued or developed a number of plans and policies, including:

- a policy statement on managing rangelands
- a new drainage policy which aimed to minimise the environmental impact of saltland drainage and reduce conflict, through a catchment approach to drainage proposals
- a State policy on natural resource management and partnership with community groups
- a report on priorities to reduce greenhouse gas emissions in agriculture was jointly developed with other agencies
- a ‘Planning for Agricultural and Rural Land Use’ discussion paper was co-developed with the Western Australian Planning Commission and involved extensive community consultation.

The WA Government’s Salinity Action Plan was a major initiative. This plan aimed at controlling salinity and reducing its impact on agricultural land, water resources, natural diversity and built infrastructure. The plan included the Rural Towns Program which entailed planning, technical advice and direct funding of works to halt and reverse groundwater rise in those country towns which were most under threat from salinity. Sixteen towns were involved.

Other Salinity Action Plan activities included revegetation on farms, a water use calculator for estimating water use in farming systems, initiation of a best drainage practice project for the eastern wheatbelt, completion of a high water use farming system project, negotiations with the Commonwealth to modify the Rural Adjustment Scheme to permit cost sharing for critical works required for catchment management projects, and...
development of standard methodology for local-scale catchment management.

From 2003 to 2008 the department took a lead role in the coordination, management and delivery of the National Action Plan for Salinity and Water Quality and the Natural Heritage Trust (NHT2). This plan was the extension, in Western Australia, of the Natural Heritage Trust and the National Landcare Program. Some $400 million of Commonwealth and State funds were invested over the period in community partnerships to achieve natural resource management outcomes under the regional delivery model. This model was based on catchment-scale landscape and natural vegetation targets set by five groups. These were the Avon, South West, South Coast, Northern Agricultural and Swan Catchments. These groups carried out the planned programs.

Specific State plans under the State Salinity Strategy related to the Catchment Demonstration Initiative (CDI) and the Engineering Evaluation Initiative. These initiatives were designed to provide long-term economical solutions to salinity management. Four catchments were selected for the CDI initiative, which included surface water management, greater use of deep-rooted species and establishment of large areas of salt-tolerant plants.

As part of the focus shift to catchments, the rapid catchment appraisal system was extended to a further 1.83 million hectares.

Examples of the benefit-cost for industry resource protection were also given on the basis of plant pest and disease and animal pest and disease eradication, vertebrate pest control, work on chemical residues and inspection of pastoral properties. All the selected examples were favourable to the department.

A formal process designed to improve decision-making in land use planning was developed and called AGPLAN. It was used to identify and protect areas of key agricultural significance, avoid land use conflicts, integrate catchment and land management and environmental repair requirements, and encourage economic development and diversification in an environmentally responsible manner. The department developed a benchmarking method for assessment of existing surface water management works on farms. This study was intended to guide future work on catchment water planning.

The annual statement by the Commissioner for Soil and Land Conservation dealt with the review of drainage regulations; changes in land clearing controls which tightened the arrangements and required landholders to provide more detailed information on land clearing proposed; details of land clearing assessments approved and not approved; the number of drainage notices and those which were received in accordance with published drainage guidelines; the number of soil conservation notices issued; and the condition of the resource base with particular reference to dryland salinity in the south and to rangeland condition in the north.

The monitoring of the extent of salinity and the condition of rangeland were important processes in assessing whether sustainability was being achieved. Input to government policy on a range of issues was another important sustainability activity. Remnant vegetation protection was managed through an agreement that all relevant government authorities would rely on a single evaluation process, with the assessment made on nature conservation and land conservation criteria. Over the period since conservation covenants were introduced in 1986, almost 93 000 ha had been protected. In some cases farmers who wished to clear a significant proportion of their farms were prevented from doing so because of a high level of clearing elsewhere in their catchment. A pilot natural resource adjustment scheme was established under which disadvantaged landholders were eligible for compensation. The prime responsibility for approval or not of clearing was moved from the Department of
Agriculture to the Department of the Environment.

The department set up a series of 21 weather stations to provide additional information to that provided by the Bureau of Meteorology to measure changes in climate over the next decade. These will form a valuable input into the Centre for Ecohydrology which has been set up with the University of WA. The Centre for Ecohydrology was established as a joint initiative between the department and the university as part of the Agricultural Research WA (ARWA) Alliance.

One indicator of the impact of the program was that the number of tree seedlings planted trebled between 1996/97 and 1998/99. There was an increase in integrated farm forestry which the department actively supported. With acidification increasing, the Soil Conservation Service supported the Time to Lime campaign. There had been a decline in land clearing resulting from changes in government policy and the active implementation of this policy through the department. Farm plans and programs had been widely adopted. Surveys indicated that 19 per cent of farm plans included predominantly natural resource information, 30 to 32 per cent included information predominantly related to business planning and 42 per cent included a mix of natural resource and business information.

The department’s work on enhancing the capacity and willingness of communities to adopt ecologically sustainable development principles had been an important component of its activities. An Agricultural Land Use Planning Policy and Procedures manual was also drafted for use in providing input to land use planning processes.

Fulfilment of the aims of the Salinity Action Plan was driven by focus catchments for which the department had formal responsibility. At the time of reporting 54 focus catchments existed throughout the South West. Agricultural region planning tools known as AgET and MODFLOW were developed and validated and were ready for use with farmers to evaluate the impact of catchment plans on groundwater conditions and soil salinity.

The department developed a benchmarking method for assessment of existing surface water management works on farms. This was designed to guide future work on catchment water planning.

A key part of the Natural Resource Management Program was the continued work on cropping initiatives and practices. These included the role of nutrient and stubble management, herbicide resistant weeds, the changing nature of diseases and the advent of new plant and animal diseases. This work was primarily carried out in the regions and is summarised below.

**In the high rainfall areas:**

The change resulted in programs such as:

- treatment of 2600 ha with 30 000 tonnes of red mud to reduce phosphorus loss from sandy soil in the Peel-Harvey catchment area
- working with community groups in the Birrega catchment to develop innovative catchment-based management of drainage water in the rural area. The initiative was expected to improve water quality and ecological values of riparian areas through using revegetation as nutrient filters on 80 km of drains in the Peel-Harvey catchment
- Water Wise on Farm irrigation training and information program was delivered to six priority groups in the Harvey, Manjimup, Scott River and Carnarvon irrigation areas
- development of policy and guidelines under planning legislation of proposals to retain productive agricultural resources
- development of a code of practice for the management of horticultural land on the Swan Coastal Plain to minimise nutrient loss to the subsurface water resources
• obtaining funding for the preparation of a database for determining the availability of suitable land and water resources for horticulture development in the South West

• development of a management plan for the East Muchea catchment, reconciling the varying objectives of landholders for incorporation into the Chittering Shire’s local rural strategy

• encouragement of integrated tree production by farmers in the South West through leading a group of farmers to look at developments in eastern Australia and New Zealand, improving liaison with industry, formation of a farmer group in the Peel-Harvey catchment to implement the establishment of pines on unproductive leaching sands, and increasing the understanding of soil suitability for blue gums

• the Blackwood Catchment Coordinating Group signed an agreement with the Sustainable Rural Development Program to obtain $40 000 per year for program support and $60 000 for administration. This led to the Blackwood Land Conservation District being established, setting a precedent for regional bodies to take advantage of the statutory functions available to the LCDCs while not duplicating the actions of shire-based LCD committees

• development of a strategy for the management of the Leschenault catchment to maintain its long-term productivity while improving or maintaining the water quality of the inlet

• development of a proposal to obtain information on high water use on properties as a basis for determining alternative approaches.

In the medium-low rainfall cropping/grazing areas:

• consultation with farmers, consultants and other stakeholders in each of six operational areas in the development of program plans and setting priorities

• establishment of 30 catchment management groups in the central wheatbelt representing 470 farmers

• fostering better management of seasonal risk by introducing a software package, ‘Rainman’ which:
  – allows extraction of rainfall data from a large number of sites in Western Australia
  – provides information on the soil water stored before the beginning of the season
  – starts a research project investigating the recharge being contributed to the groundwater system by unproductive acid sands

• establishment of the Avondale Landcare Centre, which attracted some 5000 visitors in 1994

• demonstration through experiments at Corrigin that deep placement of nutrients stimulated crop growth and production in soils without physical subsoil constraints in seasons where rainfall is sufficient to wet deeper soil layers

• establishment through a survey of the Avon River catchment that 50 per cent of the catchment soils had a pH profile that indicated the application of lime would be profitable. About 75 per cent of topsoil (0-10 cm) had a pH below 5.5, 40 per cent of subsoils (10-20 cm) had a pH less than 4.8 and 25 per cent of deeper subsoil (20-30 cm) a pH less than 4.5. To the date of reporting this survey had tested 3000 sites. Large liming demonstrations installed in 2006 showed little benefit because of the dry conditions

• establishment of a web-based dataset in partnership with the Avon Catchment Council to allow community-collected groundwater data to be collated into a managed database for easy access
• mapping of the condition and extent of remnant vegetation, using Landsat images in association with CSIRO
• the beginning of mapping of the South Coast, including hydro-geological mapping
• development of six catchment plans involving 150 individual farm plans incorporating NRM practices on the South Coast, which resulted in more than 10 000 ha of perennials being planted.

A further strategy named Southern Prospects for managing natural resources and developing rural communities on the South Coast was launched by the Minister for Agriculture after widespread consultation. Funding of the strategy amounted to over $4 million from a range of sources. Projects were developed and funded for:

• small catchment support teams to provide technical advice and group support to small catchments on the South Coast
• screening 2500 native species for their revegetation, environmental and economic potential
• ensuring that pests and weeds on both public and private lands were controlled in an integrated and efficient manner
• evaluating promising components of high water use farming systems
• monitoring and rehabilitating water resources
• ground works for the Gardiner and Corackerup catchment
• vegetation management for the Fitzgerald biosphere
• a photographic and written record of the Kalgan River
• four Green Corps teams to implement works in critical parts.

Some pastoral area activity:
The program examined ways to improve the economic and environmental sustainability of irrigated agriculture on the Ord River Irrigation Area. It identified water management practices as requiring adjustment.

Agriculture WA was aware that the government had approved a detailed feasibility study for the development of large scale irrigated agriculture in the west Kimberley and some 64 000 ha of land had been identified for potential development. This was not continued but it remained a possibility for the future.

Western Australia was responsible for a national rangeland monitoring program and had established nearly 1100 rangeland management and sustainability sites.

**Special activities during 2007/08**

The department developed and launched the WA Government’s new food marketing campaign *Buy West, Eat Best*, which provided consumers with an assurance that they are buying products produced in Western Australia.

The department developed and established the first commercial cereal breeding company known as InterGrain Pty Ltd. This was a partnership between the Department of Agriculture and the Grains Research and Development Corporation. The arrangement gave plant breeding research workers access to new germ plasm via collaborative initiatives with the Molecular Plant Breeding Cooperative Research Centre and the China–Western Australia agreement on barley. It absorbed the department’s wheat and barley breeding staff.

During 2007 the Biosecurity and Agriculture Management Act was passed. This was an important piece of legislation which improved the ability of the State to manage, prevent and contain biosecurity risks, including pest plants and animals as well as diseases.

The department also enhanced the biosecurity team of inspectors and detector dogs and launched the new look Quarantine WA (QWA) initiative.


**Reporting requirements**

During the period the department was required to report on its work against a series of outputs. These performance indicators were set at the beginning of the year and ranged across the total activities of the department. Also it had to report against an *efficiency indicator* dealing with the average cost per unit of knowledge obtained. The data provided, which came from independent sources, showed that Western Australian agriculture had outperformed that of all other states in each area under consideration. The reporting requirements asked for a measure of the *average cost per unit of knowledge gained*. This was difficult to calculate and the calculations inherently included estimations. Since subjective estimates were involved, the whole process could be regarded as of questionable value on any objective basis.

The department was also required to report on the *outcomes in the improved sustainable development of the industry*. This program required the department to meet efficiency indicators. Efficiency indicators were also applied to the work of the Rural Adjustment and Finance Corporation.

The Agriculture Protection Program was also examined. The process addressed the department’s objective to minimise the impact of pests and diseases on productivity and market access. The program was also required to meet *effectiveness indicators*.

The services provided by the Agriculture Protection Board were also examined. These services were also subject to efficiency indicators.

**Miscellaneous information in the key performance indicators**

Between 1930 and 1981 wheat yields increased by 7 kg per hectare per year. The average yields across the State in the 1960s and 1970s varied with season around 1.05 tonnes per hectare. The rate of increase rose to 21 kg/ha/year between 1982 and 2006 for an average yield around 1.6 tonnes per hectare. Very poor seasons in 2000, 2002, 2006 and 2007 contributed to much greater yield variability.

In 2007/08, 42 per cent of the State’s wool clip was classed as superfine (less than 19.5 micron diameter) compared with just 37.5 per cent in 2006/07.

An independent survey in 2006/07 found that:

- 94 per cent of agricultural establishments performed some form of natural resource management
- agricultural businesses invested an estimated $526 million on NRM
- on an individual farm basis $41 000 was spent on NRM
- increased productivity and farm sustainability were the most commonly reported reasons for improving NRM practices
- continuing difficulty due to seasonal conditions limited the capacity of farmers to adopt some NRM practices.

**A concluding comment**

Since the beginning of the current period (1995 to 2008) the full weight of the modern management reporting philosophies has been implemented by the WA Government. The modern reporting system is clearly costly. It is not a ‘free good'. Every person employed in the preparation or assessment of the information, much of which is subjective, is directly competitive with a person providing a service to the community, or a hospital bed. Across the service there would be hundreds if not thousands of people doing just that. There is a real need for an objective benefit-cost analysis to be made of the whole system.