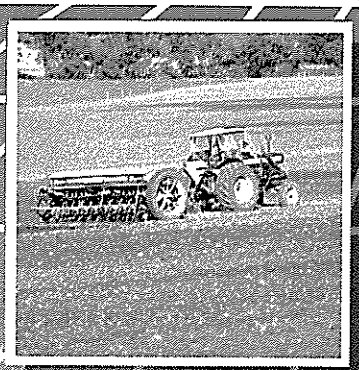
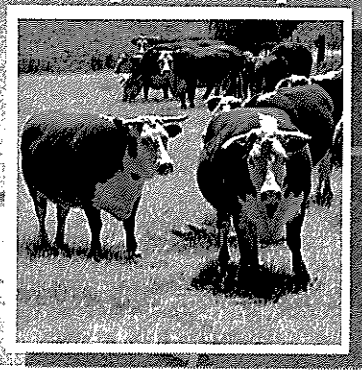
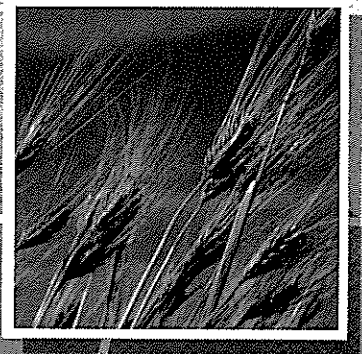
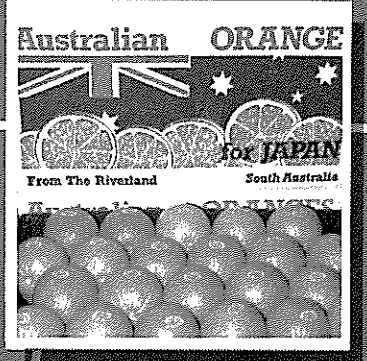
DIRECTIONS
IN SOUTH AUSTRALIAN AGRICULTURE 1987–89









Department of Agriculture
South Australia

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Foreword

The Department of Agriculture has been providing agricultural services to South Australians for almost a century. During this time the complexities of production, marketing and resource management have grown, necessitating highly sophisticated research and extension and an extensive legislative back-up.

The Department of Agriculture continues to meet this challenge and has developed a planning process that enables it to provide innovative and responsive services that will help maintain agriculture's prominence in the economic development of the State. Under the leadership of the new Director-General of Agriculture, Dr John Radcliffe, the Department enters the last three years of the 1980s conscious of the great challenges that face the rural sector.

This is the third corporate plan, following on from Sagric 83 and Sagric 84-87. Chapters were written by specialist departmental staff and discussed for the first time with industry in the process of planning. They describe the economic, technological, environmental and social climate in which farmers are operating and in which the Department is planning its services for the future.

As Minister of Agriculture, I highly commend this document to primary industry organisations, agribusiness, rural community leaders, farmers, and to departmental staff, as a guide to where the Department is going and how it plans to get there.

Kym Mayes, MP
MINISTER OF AGRICULTURE

Contents

Farming in South Australia

Most of South Australia is arid or semi-arid. Only four per cent of the State's total area receives more than 500 mm of rain each year and only nine per cent of farm and pastoral land is under cropping or permanently improved pasture. With mild wet winters and hot dry summers, it has a climate almost identical to that of Mediterranean countries. Despite the harsh climate, the State contributes about 12 per cent of the gross value of Australian agriculture.

South Australian farmers have developed a highly productive agricultural system that is based mainly on the integration of cereal and livestock production. The State has three main agricultural zones.

Pastoral zone: The pastoral zone is characterised by low, unreliable rainfall. Its agricultural production is based entirely on wool and beef. Stocking rates in this area are generally described by the number of head to a square kilometre.

Cereal zone: The cereal zone has a more reliable rainfall. Production is based on a cereal-livestock ley system, with wheat and barley crops rotated with sheep and cattle grazing on legume-based pastures. This zone accounts for about two-thirds of the annual gross value of agricultural production in South Australia.

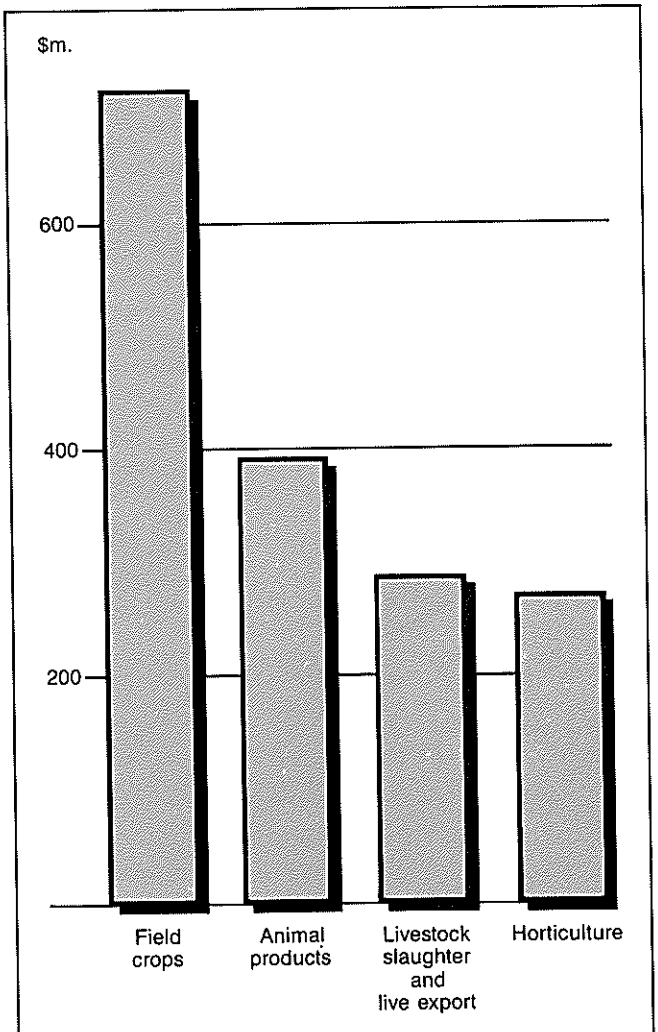
High-rainfall zone: A wide range of farming activities is carried out in the high-rainfall zone, including beef, lamb, wool, dairy production and other livestock enterprises, and a variety of field cropping and horticultural production.

The low winter rainfall and hot, dry summer is ideal for cereal growing and this accounts for about 90 per cent of the total area cropped. Wheat is the most valuable crop, followed by barley. More than one-third of the nation's barley is grown in this State.

Livestock and livestock products make up about 40 per cent of the gross value of South Australia's agricultural production. Sheep grazing is predominant, with 80 per cent of sheep being Merinos. The Merino introduced by South Australian pioneer breeders has been developed into today's large-framed type that yields an exceptionally heavy clip of medium to strong-quality wool.

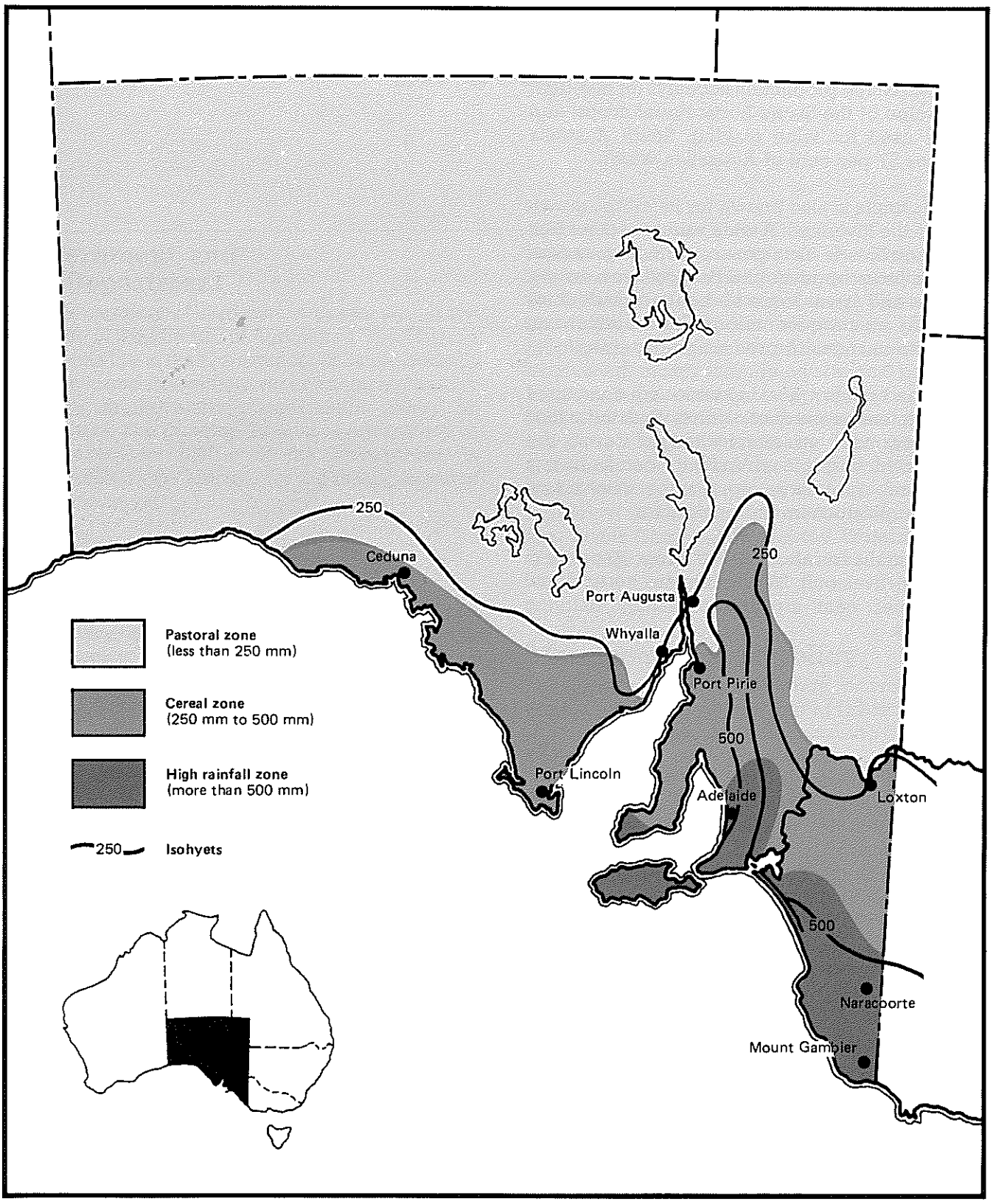
Beef cattle are produced in the northern pastoral region and in the high-rainfall areas of the South East, the southern hills and Adelaide Hills. Eradication of bovine brucellosis and tuberculosis from the State's cattle through a major State-Commonwealth campaign is almost completed.

The dairy industry is mainly confined to high-rainfall or irrigated areas in the southern hills, Adelaide Hills, Lower South East, and Lower Murray. The industry is going through a time of structural adjustment as a consequence of the decline in export opportunities and difficulties in disposing of Australian production surplus locally.



Gross value of agricultural production 1984-85

Source: Australian Bureau of Statistics



Main agricultural zones

South Australia is famous for its wine-producing areas — the Barossa Valley, Clare Valley, Coonawarra/Padthaway, Southern Vales and the Riverland. Grape production accounts for one-third of the value of the State's horticultural crops, and most is used for wine making. South Australia produces 57 per cent of Australian wines.

South Australia is also known for its citrus, grown mostly in the Riverland. A wide variety of other fruit and vegetables is also grown, including apples, peaches, pears, apricots, cherries, potatoes, onions, tomatoes and peas. Some horticultural industries are facing severe economic problems which are leading to changes in production patterns.

The pig and poultry meat industries are dominated by large intensive-production units. Both industries underwent major structural changes during the 1970s. Production in each industry comes from a small number of large companies involved in breeding, production and marketing.

South Australia has about 19 000 farms; 70 per cent are cereal/livestock, 20 per cent are horticultural and 10 per cent are predominantly dairying properties.

Department of Agriculture — an overview

Government and the Department

The Department of Agriculture comes within the portfolio of the Minister of Agriculture. The Minister is responsible to the Government of South Australia for administering legislation concerning agriculture and for implementing Government policy on agriculture. The Director-General of Agriculture, as chief executive officer of the Department, is responsible to the Minister for the management of the Department.

Origins

The provision of State-Government-sponsored agricultural services to the farming community dates back to the late 19th century, when advisory services were developed through the Agricultural Bureau, research was initiated at Roseworthy Agricultural College, and regulatory services began under legislation administered through a Stock and Brands Department.

Services and resources

The Department of Agriculture has evolved in step with the changing needs and circumstances of the people of South Australia. Today, the Department provides a wide range of services carried out by staff in metropolitan, regional and district offices, research centres and laboratories. About 1 300 people work in the Department of Agriculture, of whom about one-third are professional agricultural scientists or veterinarians. About 1 000 individual projects involving research, regulation and extension are being carried out in various disciplines relating to agriculture. These are conducted from more than 50 locations across the State. The Department is funded by the South Australian Government, and receives additional support from the Commonwealth Government, industry, and other special funding bodies.

Extension services are provided throughout the State by specialist staff who work together as multi-disciplinary teams. Research is conducted at research centres and laboratories, and on farmers' properties. Specialist information from the diagnosis of animal disease, and the analysis of soil and plant nutrient status and water composition is made available to clients. The Department administers Acts and Regulations on behalf of the South Australian and Commonwealth Governments and advises on codes of practice. Staff are employed to ensure regulatory standards are maintained, mostly through educational programs, supported, if necessary, by appropriate legislation. Staff of a number of statutory authorities, including the Pest Plants Commission, Vertebrate Pests Control Authority and Meat Hygiene Authority, are integrated with the Department of Agriculture. Draft legislation is being prepared to amalgamate the Pest Plants Commission and the Vertebrate Pests Control Authority.

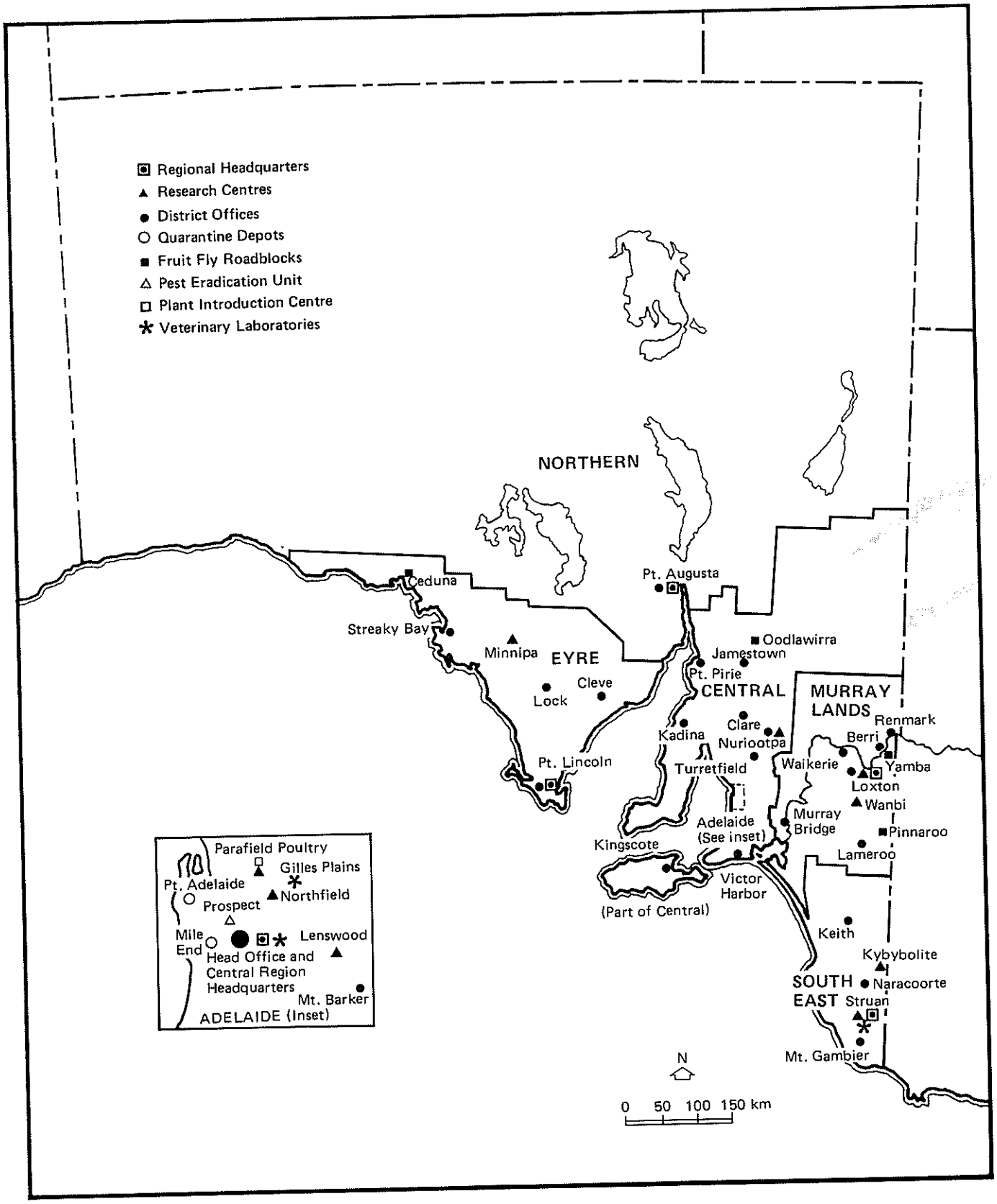
Management and policy

The Department of Agriculture consults farmer groups and industry organisations to ensure it takes all interests into account when advising the Minister and Parliament on policy issues.

The Department of Agriculture operates through the Board of Management, which meets monthly. The Board consists of the chief executive officer, directors and chief regional officers and is advised by several permanent committees, such as the Research Management Committee, the Extension Policy and Planning Committee and the Corporate Planning Group. In addition, review committees are established as the need arises to examine specific aspects of the Department's operations. These review committees, which generally include an industry representative or producer, seek comments from agricultural organisations and individuals before final decisions are reached.

Organisation, functions and services

The Department is organised into regions and divisions. Regional activities are tailored to local needs through a network of district offices, research centres and laboratories. The industry-based divisions and support divisions are located in the Adelaide metropolitan area. They provide specialist support to regional operations as well as assuming primary responsibility for policy development.



South Australian Department of Agriculture — offices and regional boundaries

Charter

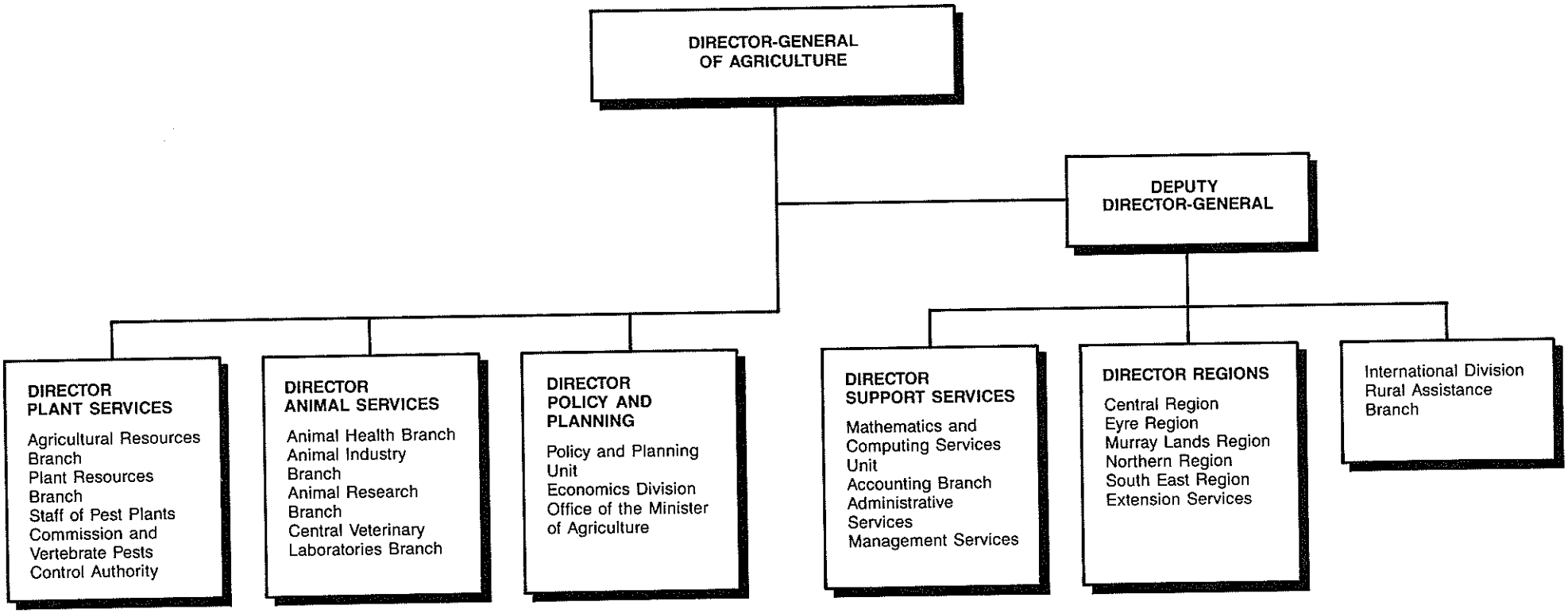
The Department of Agriculture operates under the following charter of corporate objectives and functions.

Corporate objectives

- To contribute to the social and economic welfare of South Australia and the nation through provision of services related to agriculture.
- To stimulate and assist the agricultural sector to provide high-quality food and fibre at competitive prices for the benefit of all South Australians.
- To encourage the most efficient use of the State's natural resources relevant to agriculture (including soil, water, plant and animal resources) for the benefit of the entire community.
- To assist the State's rural industries to remain economically sound and to assist participants in the agricultural sector to advance their physical, social and economic welfare in line with the remainder of the community.
- To promote an understanding and appreciation of the contribution of the agricultural sector to the economic and social welfare of South Australia.
- To further the health and well-being of economic, farm, laboratory, sport, zoo and companion animals.
- To promote the development of technical and trading relationships with developing countries through provision of expertise to support their agricultural growth.
- To maintain a high level of professionalism, motivation and achievement by staff in implementing Government policies and in serving the community.
- To provide equality of employment opportunity in staff selection and employment and a productive career for all staff.

Corporate functions

- Provide advice to the Government to assist in the formulation of agricultural policies.
- Administer Government legislation designed to manage and enhance the development and quality of production from the State's agricultural industries.
- Prevent the introduction of new and control the spread of existing plant and animal pests and diseases that adversely affect agricultural industries.
- Provide research, extension and inspection services to ensure that food of acceptable quality and safety is available to the consumer.
- Encourage the efficient use and conservation of the soil and water resources used in agriculture.
- Conduct research into the biological, physical, social and economic aspects of existing and potential agricultural industries and improve the quality and efficiency of production and marketing.
- Provide diagnostic services for and conduct research into diseases of farm, sport, companion, zoo and laboratory animals and provide a range of species and strains of animals for research and educational purposes.
- Provide an agricultural advisory service to farmers and the community covering technical, economic and marketing aspects.
- Provide agricultural expertise to developing countries in compliance with Government policy.
- Administer funds made available for the improvement of primary production, rural adjustment, and assistance to rural producers who experience hardship as a result of natural disasters.
- Provide support services across the Department of Agriculture to facilitate the operation of the Department's programs.
- Conduct staff training, equal employment opportunity, and occupational safety and health programs for departmental employees.



Department of Agriculture, South Australia — organisation structure

Programs

Eight programs are being carried out to achieve the Department's objectives.

- Agricultural industries policy
- Agricultural crop industries
- Horticultural crop industries
- Animal industries
- Agricultural resource management
- Farm management and rural community support
- State disaster, planning, control and relief
- Support services

Subsequent chapters outline the purposes of these programs and describe the environment in which they operate. Problems facing farmers are identified and likely developments relating to agriculture are discussed. Each program chapter outlines the Department's activities and summarises the major issues likely to affect farmers and the Department during the next three years.

Corporate goals planned by the Department of Agriculture are listed at the end of program chapters.

Agricultural industries policy

Two trends are apparent when considering the place of the agricultural sector in the Australian economy.

First, while the agricultural sector is not growing as fast as the total economy, it nevertheless continues to grow in absolute terms.

Second, the value of agricultural exports remains significant. The value of agricultural exports in the three years ending 30 June 1985 represented 37 per cent of Australia's export income.

The relative decline in economic importance of the agricultural sector is a common feature in industrialised countries. Other sectors of the economy, especially the tertiary sector, are growing more rapidly than agriculture.

The contribution of agriculture to the South Australian economy broadly parallels that of agriculture in the Australian economy as a whole. However, agricultural production is a greater contributor to Gross Domestic Product in South Australia than in any other state except Queensland. By comparison, mining in South Australia contributes only about one-fifth of the value of agriculture.

Agriculture will continue to play an important role in the growth of the Australian and South Australian economies. However, it is necessary for the agricultural sector to continually adapt to changing economic and social pressures.

By stimulating and assisting the agricultural sector to provide high-quality food and fibre at competitive prices, the Department of Agriculture aims to help the agricultural sector make the most efficient use of the State's natural resources, and maximise its contribution to the economic and social welfare of South Australia and the nation.

Agricultural trade

Australia's main grazing and broadacre cropping industries derive a substantial part of their revenue from exports and they will continue to do so. A number of other industries, such as fruit and vegetable growing and the pig, poultry and dairy industries, now supply mainly the domestic market, and future industry size will primarily depend on Australia's population growth and consumption patterns. There is potential to develop worthwhile overseas markets for some horticultural products, especially in Asia.

A feature of international trade in agricultural products is the high degree of overseas governments' involvement and intervention. The basis of Australia's agricultural trade policy is the pursuit of predictable and stable access to overseas markets at profitable prices. In the past, agriculture has not been significant in multilateral trade negotiations through the General Agreement on Tariffs and Trade (GATT) although it may be in future rounds of discussions from 1986. The objectives of these discussions will be trade liberalisation and more effective trade rules by addressing such long-standing issues as non-tariff measures, subsidies and safeguards against dumping.

The most comprehensive form of government intervention in agriculture is the Common Agricultural Policy (CAP) evolved by the European Community. This policy supports European producers through intervention and stockpiling of agricultural products when domestic prices fall below fixed and usually very high prices. Total insulation from world prices is achieved through a system of variable levies. Because support prices encourage production and discourage consumption, surpluses are inevitable. These are dumped on overseas markets with the assistance of substantial export subsidies.

For Australia, the impact of the CAP has been:

- the total loss or severe erosion of former markets in the EEC;
- depressed world prices accentuating declining terms of trade for Australia's agricultural exporters who rely on world prices;
- unfair competition on world markets from heavily subsidised exports;
- intensified competition from other traditional exporters, who in turn also support their own agricultural products.

An example of the last is the 1985 US Farm Bill which provides for export subsidies, credit assistance and concessions for buyers of US agricultural products.

The US Farm Bill also offers price support to US farmers through a low-interest loan program. The loan, which is essentially a low-interest advance payment for the crop, allows eligible farmers to avoid selling into depressed markets, especially at harvest.

Australia's agricultural exports will continue to face depressed prices, restrictions on access to markets, and subsidised competition.

Exchange rates

Exchange rate policy is a major issue because of the importance of exports of major Australian agricultural products. Changes in the exchange rate affect farmers in a number of ways. A lower value for the Australian dollar, while increasing export returns (in Australian dollar terms), can be inflationary, thereby causing greater cost pressures on farmers. The local cost of imported goods also rises.

It is expected that the value of the Australian dollar will remain at low levels against most major currencies for some time.

Interest rates

The high short-term interest rates experienced in the mid-1980s are the result of strong private and public sector demand for funds and the continued tight monetary policy designed to lend support to the Australian dollar and to limit inflationary pressures.

It is expected that interest rates will remain high in the short term but ease in the medium to longer term.

Government policies

The Commonwealth Government has direct and indirect effects on agriculture through its economic and industry policies. State governments can attempt to influence Commonwealth policies through, for example, involvement on the Australian Agricultural Council and Standing Committee on Agriculture and making submissions to such bodies as the Industries Assistance Commission (IAC) and Senate Standing Committees.

The State Government, through the Department of Agriculture, has the responsibility for evaluating the impact of Commonwealth policies on the rural community and ensuring that any problems or inconsistencies arising from the implementation of such policies are conveyed to the Commonwealth Government.

At the same time, farmers should benefit from a continuation of the trend for their farming organisations to become stronger and espouse professionally prepared and capably evaluated sectional or industry policies. This is having an impact on government decision making.

Increasing production efficiency

The ratio of prices received by farmers to prices paid has tended to decline over the long term. Farmers have adapted with sustained improvement in productivity, achieved mainly by increasing the substitution of capital for labour, increasing farm size, and adopting new technology. The development of cost-cutting strategies and more emphasis on product development and on marketing of farm produce have also been important.

In the prevailing economic environment, farmers will continue to be faced with pressure to improve productivity. The Department of Agriculture has an important role in ensuring all available knowledge on new technologies and products is extended to the farming community. Resources in extension must be maintained and developed to ensure that modern technology is communicated to the rural industries, helping them to withstand international competitive pressures. Industry is recognising that financial support for extension programs is becoming increasingly important.

The Department, after reviewing its research operations, is rationalising its research facilities. This will facilitate the development of technology to meet the changing needs of agriculture.

The Department plans to consolidate its animal research in centres of excellence. Research on sheep for wool, sheep for meat and cattle will be done at Turretfield, Kybybolite and Struan Research Centres respectively; research into regional issues will continue at Minnipa and Wanbi Research Centres.

Field crop improvement research in South Australia is being brought together at a new centre to be located at Northfield. The Field Crop Improvement Centre will undertake plant breeding and testing in all the major field crops in South Australia, bringing together some of the breeding programs at present spread among four organisations. The advantages will be better facilities to support the programs and efficiency of operation by having all the scientists and resources involved in plant breeding based within one administrative structure.

Agricultural adjustment

During the mid to late 1980s, South Australian farmers are likely to experience difficult trading conditions as cost-price pressures increase and farm profitability falls. Forecasts suggest that surplus production for world markets will cause serious financial problems for farmers producing cereals, winegrapes, milk and sheep meat.

High interest rates may be a serious problem for farmers with large debts.

Legislation was proclaimed in 1985 to provide for a new Commonwealth/State Rural Adjustment Scheme and a State-funded Rural Industry Adjustment and Development Scheme. These two Schemes will make available about $40 million a year as concessional loans to redevelop farms, change farm enterprises, buy more land and restructure commercial debts. These measures will help adjustment on farms where changes are needed to maintain profitability. The Rural Adjustment Scheme also provides for household support payments to non-viable farmers who need help to cover family living expenses and relocation costs while leaving agriculture.

The Rural Assistance Branch administers all schemes for primary producers including natural disaster assistance and one-off schemes such as the Vine Pull Scheme and assistance under the Brucellosis and Tuberculosis Eradication Campaign, both of which are jointly funded by the State and Commonwealth Governments.

A commercial lending program was introduced in 1986. This supplements other assistance schemes and will allow the Government to reduce debt-servicing costs for a wider range of clients as part of its assistance package.

The Rural Assistance Branch administers loans valued at $86 million to some 2 800 farmers. This amount is about 10 per cent of the rural debt in South Australia. This proportion may well rise to 15 per cent by 1988-89.

Departmental agricultural economists and the Rural Assistance Branch keep in touch with rural industry organisations and the agricultural community to determine what assistance is required. The Department will be working with the Rural Development Centre of the University of New England to determine the adjustment needs of rural communities on a regional and State basis. The Department will continue to evaluate the success of assistance schemes.

Overseas projects

The Department of Agriculture provides specialist and administrative staff and support to Sagric International Pty Ltd. Sagric International Pty Ltd, a registered company wholly owned by the South Australian Government, reimburses the Department on a commercial basis for these resources from income derived from overseas contracts. These contracts are established to market South Australian expertise internationally to foster markets for South Australian equipment, commodities and services.

At present Sagric International Pty Ltd holds two large overseas contracts: the Commercial Polytechnic Project in Indonesia, and the Dryland Farming Project in Jordan. Both projects are financed by the Australian Development Assistance Bureau. Other contracts are held with the Australian Centre for International Agricultural Research in Malaysia, the United Nations Development Program in Sri Lanka, the Yemen Arab Republic, and with private enterprise groups in Saudi Arabia and Pakistan.

Current activities

The objective of the agricultural industries policy program is to identify and provide advice to the Minister of Agriculture on strategies for the effective development and management of Government policies in agriculture.

The activities carried out in the agricultural industries policy program help develop and support South Australia's point of view on national agricultural issues. The following are examples of activities carried out in the agricultural industries policy program:

- developing policy on key issues through the preparation of submissions for presentation to the IAC and other inquiries on many aspects of agriculture;
- developing a broad understanding of adjustment options and informing farmers and agri-industry groups about the options available to them;
- evaluating policy changes that have relevance to South Australia, especially those relating to world trade;
- assisting with the development of markets for new agricultural products and promoting existing products on local and overseas markets;
- developing policies and procedures for the direction of departmental activities in research and extension;
- contributing to the deliberations of the Australian Agricultural Council.

Major issues

Important issues affecting agricultural policy include:

- high interest rates, low market returns and on-farm and off-farm cost increases that are likely to increase pressures on most farming enterprises in the next few years;
- the more severe impact on some industries, such as the dairy, cereal growing, winegrape, citrus and sheep meat industries, of present economic conditions, particularly oversupply and dampened demand;
- the impact of fiscal, monetary and labour policies on agriculture;
- factors affecting trade, including the multilateral trade negotiations under GATT, tariffs, and subsidies;
- changing world markets and the consequent need to adopt a flexible and innovative approach to production and marketing;
- trends in rural borrowing and the impact of the entry of foreign banks into the rural sector;
- adjustment problems within agriculture;
- the level and type of government support and assistance that can be justified to assist the adjustment process in agriculture;
- improved efficiency in the storage handling, transport and marketing of agricultural produce;
- opportunity for even greater cooperation between the Department and industry through the new Commonwealth Rural Industry Research Act, 1985, defining areas for research, providing funding for the research and promotion of new technology, and accounting to industry for the benefits gained from the use of the funds.

Corporate goals 1987-89

Short term

Increase the range of options for rural credit by establishing a commercial farm loans scheme, funded through the South Australian Government Financing Authority and administered by the Rural Assistance Branch, for lending funds at favourable commercial rates.

Assist industry funding bodies established under the Commonwealth Rural Industry Research Act, 1985 in developing research priorities by providing advice and information on South Australian industries' research and development needs.

Medium term

Strengthen the community's understanding of the importance of agriculture to the economy through implementing public and community relations programs.

Help South Australian farm families suffering financial hardship by investigating the extent of and the main factors affecting rural hardship and developing proposals aimed at alleviating this.

In line with Government policy on deregulation, establish a system to regularly review the functions and roles of statutory authorities in the Minister of Agriculture's portfolio.

Further enhance the development of rural policy advice to Government by strengthening communication and consultation with rural groups and agricultural industry organisations.

Agricultural crop industries

During the 1970s the profitability of field crop production in South Australia encouraged farmers to shorten rotations and invest more in cropping machinery. The economic environment has changed since the turn of the decade. The outlook has now become uncertain for cereal production because of low international cereal prices.

The Bureau of Agricultural Economics (BAE) forecasts that continued world oversupply of cereal and coarse grains will depress export prices further. This oversupply is now likely to become long term as traditional buyers, for example India, have become self-sufficient. It is therefore predicted that during the late 1980s payments for wheat, barley and oats will remain well below recent levels.

Cereal production can be improved by the use of new varieties, new cultural techniques and closer rotations. However, the economic implications of these technological changes and their impact on soil fertility and structure, pests, diseases and weeds must be carefully assessed to ensure farming profitability is maintained and the soil resources conserved.

Cereal root diseases, especially eelworm, have been barriers to farms' reaching their potential wheat production. Rising costs of chemicals will reduce the use of nematicides and increase dependence on resistant cultivars. Fortunately, trials across the State are showing that correct rotations and cultivars can minimise root diseases. It is predicted that cereal eelworm will come under control when resistant varieties are used more widely in the State's cropping area. The release of resistant and tolerant wheat and oat cultivars during the late 1980s will provide farmers with increased choice of resistant crops and provide much-needed alternatives to the resistant barley varieties Galleon and Festiguay.

Leaf diseases of cereals continue to be significant. In wheat, the change in farmer preference from the variety Warrigal to Spear will result in greater incidence of septoria diseases. Stem rust should be less of a problem in rust-prone areas with the release of the rust-resistant cultivars Blade and Machete. Stripe rust will remain a problem for the Lower South East. Control will be based on seed dressings.

The trend to increased cropping of cereals in rotations will increase the problem of cereal root rots unless grass-free pastures and grain legumes are grown as break crops. With the advent of new herbicides it is becoming easier to develop grass-free or low-grass pastures.

Controlling pests of stored products is becoming increasingly important to the development of export cereal crop markets and maintenance of traditional markets. There is no tolerance of live insects in any grain being exported from Australia. To date control has mainly been achieved with chemical insecticides. However, export markets are increasingly demanding insecticide-free grain, and insecticide-induced resistance is becoming more common in some pests. Both of these trends are likely to become serious issues for cereal industries.

Some large export markets for barley have shown reluctance to buy snail-contaminated barley from South Australia. Control of snails in the field and in the stored grain will be necessary. Pea weevil contamination is also causing great concern and better techniques for control are required.

Weed control, especially that of silver grass and brome grass, and the maintenance of clovers and medics in the pasture ley phase are important.

New crops such as faba beans, other grain legumes, and pastures such as vetch will continue to be introduced. Most are likely to be damaged by insect pests — experience suggests that accidental introduction of new crop pests is highly likely, on both new and established crops. Neither the types nor the time of introduction of the pests can be predicted. The value of successful biological control of pests is well documented, and there are increasing political, social and ecological pressures to reduce the use of chemical insecticides for pest control. For the present, however, control of crop and pasture pests relies heavily on the application of chemical insecticides, and this reliance is expected to continue for the foreseeable future.

Cereal cropping in the South East requires special attention because of the wet, acid soils and disease problems. Technology for cropping wet areas needs further development. High-yielding, suitable

wheat varieties are required with built-in disease resistance, especially to stripe rust and septoria.

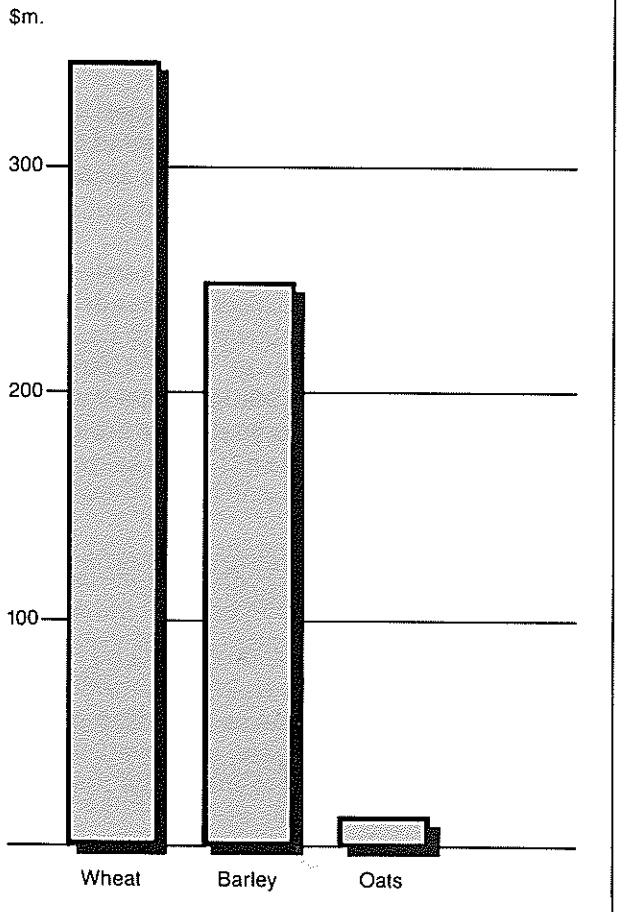
Important lupin and faba bean industries are developing in the region. These crops have disease problems that also require attention.

Cereal production

Wheat accounted for half of the cereal area in South Australia in 1985; barley, oats and cereal rye were next in importance. Most of the State's wheat and barley is produced on Eyre Peninsula, Yorke Peninsula, the Lower, Mid and Upper North, the Upper South East, the Murray Mallee and the Murray Plains.

The area sown to cereal on Eyre Peninsula increased by almost 70 per cent in the past decade. Wheat accounted for most of this increase. During this time, Eyre Peninsula, the State's largest dryland agricultural region, produced 41 per cent of the wheat, 24 per cent of the barley, and 28 per cent of the oats in South Australia.

Traditionally, malting barley has been the basis of an important South Australian export trade. These markets are now declining because of changing technology and greater self-sufficiency in user countries. As a result more feed barley is being grown in the expectation that export markets can be found for it. However, the medium-term outlook is not encouraging, given the competition provided by subsidised EEC and US barley.



Gross value of major cereal crops grown for grain in South Australia 1984-85

Source: Australian Bureau of Statistics

Oats are grown for grain, hay and grazing, with grain oats being the most significant. Production is distributed throughout the agricultural areas of the State, although use varies according to area. Much of the oat crop is used on-farm or traded between farmers. The oats entering general commerce are handled by at least five main traders. There is no statutory marketing body specifically for oats.

The Department is aware of the potential for increasing use of oats for grain production, and has embarked on an oat breeding program that has produced excellent results to date. A variety with cereal cyst nematode resistance will be available for the 1987 harvest. This will not only increase oat grain production in the cereal belt but will also lower root disease levels, enhancing subsequent wheat and barley crops.

The oat breeding program is now being expanded to develop naked oats for monogastric feed markets, and varieties possessing dwarf genes.

The cereal/livestock ley farming system requires a wide range of technological information and diagnostic services to maintain farm profitability and prevent long-term land degradation. In association with Roseworthy Agricultural College and Waite Agricultural Research Institute, the Department continues to evaluate new cereal cultivars produced from breeding programs elsewhere in Australia. Plant pathologists test breeders' lines to obtain disease tolerance and resistance, especially to cereal cyst nematode.

Field peas

Field peas is the fourth most important field crop, and the most important and longest established grain legume crop in the State. The area under field peas rose by 300 per cent over the past 10 years. Field peas are used in livestock rations and for human consumption. They also add nitrogen to the soil and break cereal disease cycles. Grower interest in field peas is increasing as a result of a combination of crop rotation benefits, new herbicides and expanding export and local markets.

In South Australia peas are grown where annual rainfall exceeds 400 mm. The current field pea cultivars are old, susceptible to disease and have an undesirable growth habit, and consequently do not meet industry needs. The Department's field

pea breeding program aims to develop cultivars that are resistant to disease, primarily to the black spot complex, are semi-leafless with better standing ability and ease of harvest, and have quality seed, increased nodulation and root system, and resistance to pea weevil damage. First varieties from the breeding program will be released to industry in 1987.

Faba beans

The area sown to faba beans is expanding in the South East and Mid North, but market trends will need continued monitoring. Growers would have sown even larger areas had not foliar diseases become a serious problem. The Department is undertaking disease control research. Export markets for faba beans for human consumption appear promising.

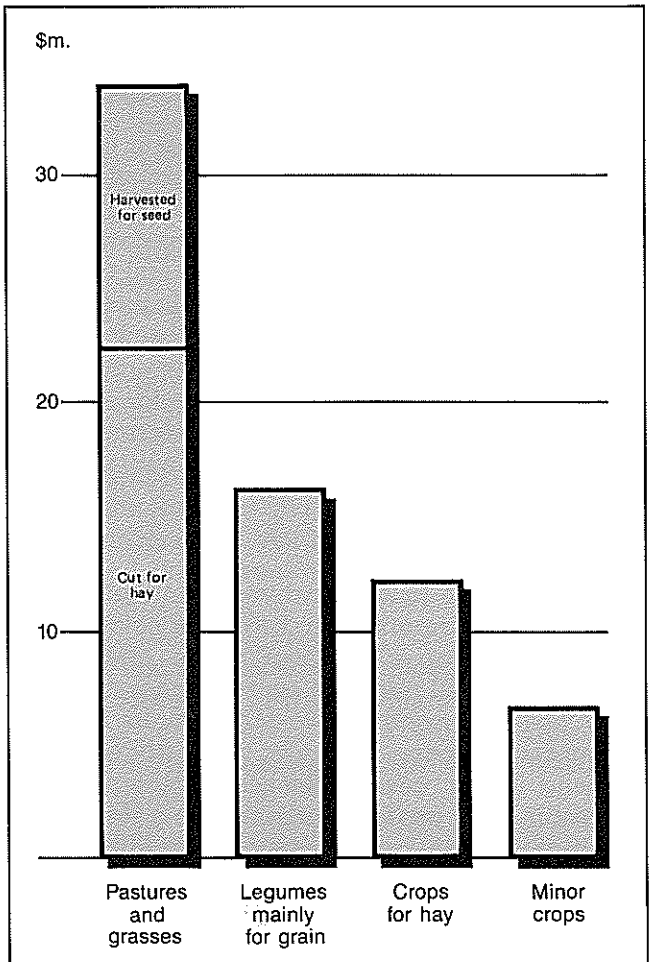
Minor crops

The area sown to lupins has not changed in recent years. The South East is now the principal lupin-growing area, within local markets in the dairy and grazing industries. Concern about lupinosis, inconsistent yields and restricted markets are limiting crop expansion. Improved varieties have higher yields and greater disease tolerance.

Two developments are increasing the appeal of lupins: techniques for overcoming manganese deficiencies, and unique biotechnological methods for the control of lupinosis.

Oilseeds are minor crops in South Australia. Oilseed rape and sunflower are grown mainly in the South East. Oilseed rape showed early promise but the area sown has decreased because production costs are high and management requirements stringent. However, the area sown is likely to increase steadily again as cereal growing becomes less economical. Sunflower will continue as a minor crop.

Cooperation with other states in the field testing of selected cultivars and lines has led to commercial production of higher yielding and better adapted cultivars of lupins and oilseed rape suitable for use in South Australia.



Gross value of field crop production (other than major cereal crops) in South Australia 1984-85

Source: Australian Bureau of Statistics

Pastures and lucerne

The lucerne industry of South Australia has three main components: seed production, irrigated fodder and dryland grazing.

South Australia's lucerne-seed production industry is Australia's main seed source. It is centred at Keith, with smaller areas near Bordertown, Naracoorte and Clare.

The irrigated fodder industry is concentrated along the River Murray around Lakes Alexandrina and Albert, and in the Mid and Lower South East. Small areas occur in the Adelaide Hills, Clare Hills, Barossa Valley and Murray Mallee. Total area sown is about 2 000 ha. It supports part of the State's dairy industry in which production is used as green-cut fodder, pasture or hay.

There is potential to develop a lucerne export industry, especially to Japan.

The key future need in this industry will be disease-resistant, persistent, high-yielding varieties. The Department conducts a lucerne breeding program that aims to regularly release improved varieties with statewide adaptation to meet this need.

The area sown to lucerne for dryland grazing and some spring hay production is about 500 000 ha. This industry requires varieties that reduce the costs of establishment, maintenance and services (fencing, stock movement), and have long-term persistence (up to 15 years). The Department conducts selection for tolerance to pasture pests

(red-legged earthmite, lucerne flea, wingless grasshopper, sitona weevil, spotted alfalfa and blue-green and pea aphids) and persistence under continuous grazing in dryland conditions.

Legume-based pastures are worth an estimated $2 500 million a year to Australian agriculture because of the nitrogen they supply to the soil. The annual medics are a major component of these pastures on the alkaline soils of the dryer areas of South Australia. The productivity of these pasture species was devastated in the early 1970s when aphids were accidently introduced from overseas.

The Department has undertaken extensive breeding programs on pasture species, centred on the production of suitable aphid-resistant medics that can replace older, aphid-susceptible cultivars. Several new cultivars have been released, and efforts to replace other old cultivars are continuing. Considerable effort is being directed at producing new aphid-resistant cultivars by backcrossing resistance genes into older aphid-susceptible cultivars. This breeding process is nearing completion for the replacement of Harbinger strand medic, while similar programs for Borung and Cyprus barrel medics are well under way. There is also considerable industry pressure to produce aphid-resistant replacements for Jemalong barrel and Tornafield disc medics, and breeding programs to achieve this have begun.

The success of these breeding programs is likely to lead to increased industry interest in producing medics with resistance to other insect pests. Screening for resistance to red mite, lucerne flea and sitona weevil larvae will be continued with the aim of uncovering useful resistant sources from the Department's medicago germplasm collection.

Greater use of herbicides in pastures has increased the demand for information on the tolerance to herbicides of cultivated species and cultivars. Crop tolerance is being evaluated so that farmers and pasture-seed producers may use these chemicals without damaging crops. A greater understanding of the population dynamics of sitona weevil has provided methods of more effectively attacking this insect at the most vulnerable time in its life cycle.

Present methods of pasture-seed production, especially of pasture legume species, are laborious and inefficient and result in expensive pasture seed. Eventually, supplies of cheaper seed may be an incentive for more extensive pasture improvement. In the meantime, the Department and seed-producing firms ran a publicity campaign to increase farmers' awareness of the advantages of buying high-quality certified seed of the most appropriate variety.

Annual ryegrass is still one of the major grasses in South Australia but its value has been undermined by the spread of annual ryegrass toxicity (ARGT). This disease is of serious concern to farmers. It will continue to spread; at present there are 600 known infected paddocks, by 1989 there could be a tenfold increase. An extension program has been developed to help farmers recognise toxic ryegrass and use appropriate management strategies to protect their livestock.

Major issues

High interest rates and ever-rising production and marketing costs are general issues that have put severe financial burdens on farmers involved in the field crop industries in South Australia.

With this in mind the following are specific issues:

- demand for greater refinement of management strategies to approach most closely the potential production of field crops (under given soil and climatic conditions). New tillage technology, revised rotations, new agricultural chemicals and fertilisers, disease-resistant varieties, efficient machinery use, the risk of soil erosion and the place and extent of legumes in the rotation - all need to be taken into account;
- availability to farmers of crop varieties most profitable to produce and which have a ready market;
- effect of trace element deficiencies in crops and pastures, especially of copper, cobalt, selenium and manganese;
- increased cereal root and foliar diseases, such as cereal cyst nematode, rhizoctonia, haydie, powdery mildew, septoria and stem rust, because of the increase in cropping intensity and decline of pastures;
- uncertainty about the long-term environmental effects and technological implications of some herbicides, fungicides and fertilisers;
- increasing demand by export markets for grain free of insecticide and other contaminants; increasing insecticide-induced resistance in some pests;

- insufficient information about the agronomic, geographic, marketing, financial, and disease aspects of grain legumes when used as alternative crops to cereals and as break crops;
- decline in the area of annual legume pastures over the past 10 years, diseases of annual legumes and the evaluation of pasture cultivars for specific soil types. Current need to promote the value of improved annual legume cultivars and improved general pasture management;
- adoption of management strategies that minimise the effect of annual ryegrass toxicity;
- increased demand for seed certification services;
- market potential for expanded use of small seeds both overseas and locally in crop and pasture systems;
- spread of undesirable weeds into seed production areas.

Corporate goals 1987-89

Short term

Provide an integrated approach to field crop research in South Australia through developing plans to establish a Field Crops Improvement Centre at Northfield, in consultation with the University of Adelaide, Roseworthy Agricultural College, the Chemistry Division of the Department of Services and Supply, and industry.

Help cereal farmers improve the profitability of their enterprises by providing information packages on the use of grain legume cultivars as break crops in cereal farming systems.

Prepare and promote extension packages on barley agronomy and production technology for barley growers in the main cereal districts when an industry funded senior adviser has been appointed.

Review the pasture research activities of the Department in the light of industry needs and recent technological advances, taking account of the whole farming system.

Medium term

Continue the selection and evaluation of legume pasture cultivars for localities throughout the State to ensure that landowners can be given up-to-date advice on legume cultivars best suited to their soils and climate.

Develop and implement systems-based extension programs to advise South Australian farmers of the latest research findings on management practices and technology suited to animal/crop systems.

Review the role of the Department of Agriculture in biotechnology development, especially in the field of plant improvement. Monitor advances in biotechnology and develop programs to ensure the availability of the benefits of new technology.

Horticultural crop industries

The gross on-farm value of production in South Australian horticultural industries was $240 million in 1984-85. Many of these industries are experiencing increasing economic pressure and are looking to expand existing markets and develop new markets, especially in Asia, Europe and North America. The Horticultural Export Development Committee has been established by the Minister of Agriculture to provide a statewide focus to marketing and the Department of Agriculture is appointing horticultural marketing officers to help industries exploit local and overseas marketing opportunities.

The Department services the apple and pear, citrus, stone fruit, grape, and vegetable industries, and a group of smaller horticultural industries. Its efforts are especially directed to the centres of horticultural production in the Adelaide Hills, northern Adelaide Plains, Barossa Valley, Riverland, Lower Murray, Southern Vales and Lower South East.

Research work is carried out at Northfield, Loxton, Lenswood and Nuriootpa Research Centres. Experimental work includes varietal assessment, virus testing and clonal selection, crop production and irrigation studies, development of techniques for integrated pest and disease control, pruning, trellising and harvesting techniques, assessment of potential of new crops, tissue analysis as a basis for determining fertiliser requirements, diagnostic, entomological and plant pathological services, studies in wine quality, post-harvest and packaging research and examination of alternative marketing systems.

Extension services include providing production and marketing advice to growers and industry. Specific advice is available on production of each of the principal crops, as well as on-farm management and redevelopment. Specialist irrigation advisory services and advice on vegetable production and post-harvest technology are provided in the Riverland. Assistance is also given to regional viticultural councils and other industry organisations.

Regulatory responsibilities include supervision of export standards for fresh fruit and vegetables; this is done on behalf of the Commonwealth. Produce is inspected at the Adelaide market, and a comprehensive fruit fly program involving roadblocks, surveillance and eradication is conducted throughout the State. The registration of agricultural chemicals used by horticultural industries is monitored to ensure that labelling and recommendations are correct.

Grapes

The gross value of South Australian grape production (for all purposes) was $81.5 million in 1984-85. This represents 32 per cent of Australian production by value. South Australian wine grape production is rising, but the State's share of Australian production (57 per cent in 1984-85) has been gradually declining for some years. This is partially owing to the development of new grape-growing areas in some states and the expansion of existing areas of production in Victoria and, to a lesser extent, Western Australia. There has also been a tendency for Sunraysia wineries to use a larger proportion of dual-purpose grapes in bulk and cask wine production.

The largest winegrape-growing area in South Australia is the Riverland, followed by the Barossa, South East, Southern Vales and Angle Vale regions and the Clare area.

Traditionally, production from irrigated areas has been used for production of wine for the bulk or cask market and for production of fortified wine and fortifying spirit while cooler climate areas have specialised in production of premium-quality wine. Large quantities of fresh and crushed grapes grown and produced in the Riverland are now sent to proprietary wineries elsewhere in the State. Proprietary wineries have progressively increased their plantings of winegrapes over recent years. They now grow about one-third of the total South Australian winegrape crush.

The rate of growth of wine sales in 1984-85 was 4.8 per cent, a slower rate of growth than in previous years, and there was a further drop in the first six months of 1985-86. The recent popularity of 'wine coolers' does not appear to have made a significant impact on wine sales. The long-term trends are uncertain.

Proprietary wineries and cooperatives alike have accumulated large stocks and are facing difficult

marketing conditions. Heavy discounting is continuing in the wine market. There is a growing volume of imports, especially bottled wine, which is contributing to the oversupply of wine.

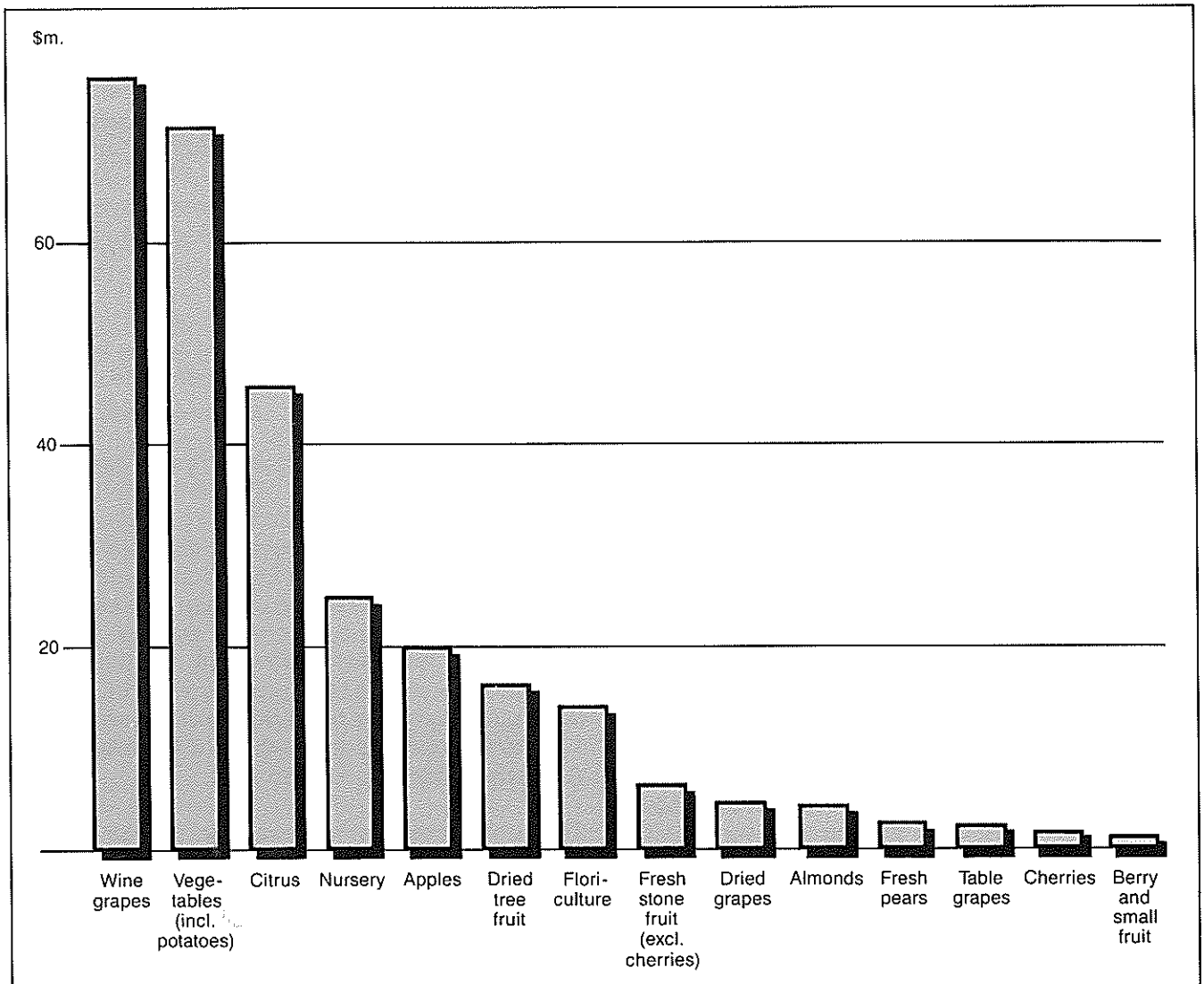
The high level of unsold winegrapes which has been predicted for some time has now become a reality. For the 1986 vintage the minimum winegrape price mechanism based on varieties was put aside in favour of a base-price mechanism. The operation of the base-price mechanism is being reviewed.

In South Australia and nationally the lack of a single winegrape-grower body has limited the effectiveness of their representation to governments. This is being addressed and the formation of a national grapegrower forum now seems likely.

Significant adjustment is occurring in the winegrape industry. Many growers, especially in Riverland, Barossa and Clare areas, will require adjustment assistance. A package of adjustment measures is available, including Household Support, Farm Improvement, Debt Reconstruction and a Vine Pull Scheme. Viable growers will need to keep improving productive efficiency by increasing mechanisation and undertaking vineyard redevelopment including use of rootstocks and improved methods of irrigation.

Alternative enterprises have been researched and extended and there has been some replanting to crops such as avocado, pistachio, almond and fresh stone fruit and table grapes. However, alternative crop options are limited without adequate irrigation.

Dried vine fruit production is fairly low from a State point of view, but in 1984-85 represented 7 per cent of Riverland grape production. There are interactions between the wine and dried vine fruit



Gross value of horticultural industries, 1984-85

Source: Australian Bureau of Statistics

industries, the quantity of grapes (mainly sultanas) being dried depending on winery demand and market prices. This makes planning for both industries difficult as supply is not known from year to year.

Poor grape crops in some northern-hemisphere countries in 1985 caused an increase in demand and price for Australian dried vine fruit on world markets. However, in the long term dried vine fruit export sales are expected to decline. South Australian winegrape producers may be adversely affected by a downturn in the dried vine fruit industry because of interstate trade in grapes and the degree to which multi-purpose grapes may be used for wine making. The domestic market requirements for dried vine fruit have increased by 45 per cent in the past 10 years.

Plantings of table grapes have increased in recent years and the industry is being further developed. Increasing attention is being given to quality production for domestic and overseas markets. A glasshouse table grape industry is emerging at Murray Bridge to produce early table grapes for markets in Melbourne, Sydney and Adelaide. Provided the table grape industry meets interstate competition by supplying high-quality products, there is potential for growth in local and especially export markets.

The activities of the Department of Agriculture include support services to the industry through industry groups, especially at regional level, and making submissions to Government inquiries.

The provision of information on the use of rootstocks and improved planting material is continuing, as is the provision of information packages on vineyard rehabilitation and improved irrigation procedures, and general vineyard management practices.

The Department is researching ways to improve the level and quality of viticultural production. Research funding will now be available through a new fund established by Commonwealth legislation in 1986 that introduces a levy on fresh, dried and crushed grapes, for disbursement by the Grape and Wine Research Council. The Department is also involved in vine improvement and regulatory functions (plant quarantine inspection).

Citrus

Almost all South Australian citrus is grown in the Riverland and Lower Murray areas.

The area of citrus (oranges, lemons, grapefruit, mandarins and limes) increased by about 10 percent in the four years to 1984 and the gross value increased by about 20 per cent over that period. The value of South Australia's production in 1984-85 was 28 per cent of the Australian total.

Citrus is exported to Asia, the Middle East, New Zealand and some other countries. South Australia is the main exporter of citrus from Australia, exporting about 15 per cent of the yearly South Australian crop (mainly oranges).

About 60 per cent of South Australia's orange production is processed into juice. A considerable proportion of citrus product used by Australian converters is imported as citrus juice concentrate. The price at which this material is imported (world price) has mainly determined the price paid to South Australian growers for processing fruit. The downward pressures on prices can be expected to continue with the projected increase in world supply of juice concentrate, especially from Brazil. The industry is attempting to stem the effects on the domestic industry through seeking additional tariff protection.

This situation and the imposition of sales tax on fruit juice cause concern for the viability of the Australian citrus juice industry. This has placed renewed emphasis on fresh fruit production in Australia for domestic and export markets. There is a need to give greater emphasis to export development in Japan and Europe and to gaining access to the United States. There would be an undersupply of citrus if these markets were effectively developed.

Departmental activities concentrate on fruit quality for fresh and juice markets, irrigation methods, post-harvest handling of citrus, determining quality and packaging requirements of existing and new markets, achieving the recognition of 'fruit fly freedom' status for the Riverland by importing countries, and assisting the industry to gain acceptance in the Japanese and other markets through commodity treatments such as fumigation and cold sterilisation.

Several of these activities are developed with industry and are supported by industry funding.

Pome fruit — apples and pears

The Adelaide Hills grow 97 per cent of South Australia's apples. Production levels have been fairly stable since the mid-1970s, and are geared mainly to local consumption.

Despite its storage problems, Jonathan is still the main apple variety at about 40 per cent of production, followed by Granny Smith and Red Delicious.

Two trends in apple marketing have emerged recently. First, there is a growing export market for

apples in South East Asia with some export growers buying from other states when not enough fruit is available locally. Second, apple-juice consumption increased by about 30 per cent in the two years to 1984. Traditionally, low-grade fruit unsuitable for the fresh market has been used for juice production. However, there is interest in establishing highly mechanised apple production units in the Riverland specifically for juice production.

Pear production is divided equally between two main growing districts, the Adelaide Hills and Riverland. Almost all of the Adelaide Hills crop is sold for fresh consumption but a large proportion of the Riverland crop is used for canning and drying.

Changes in varietal preferences are occurring within the pear industry. Duchess (WBC) is still the predominant variety suitable for fresh, canned or dried production. Buerre Bosc and Lemon Bergamot along with the red-skinned varieties Corella and Sensation are growing in popularity. There is also rising interest in Nashi fruit (Asian pears), although attaining good fruit size is a problem with this crop.

Pear production has declined about 30 per cent since 1977-78. Grower numbers have also declined, mainly in the Riverland region.

More effective domestic marketing of apples and pears requires that cooperatives, supermarkets and greengrocers develop greater capacity to handle a wider range of varieties at different times.

Cherries

The State's cherry crop, worth $1.6 million in 1984-85, is grown solely in the Adelaide Hills. Grower numbers have decreased in recent years through the sale of properties to hobby farmers and the decline and non-replacement of old trees.

The industry is labour intensive and this factor is the most critical cost component of production. The development of orchard systems that increase the efficiency of labour use is needed to ensure the long-term viability of the industry. Losses from cracking are also an important consideration.

Future prospects are generally sound provided the industry continues to invest in and encourage research into productive efficiency, and develops further market opportunities.

Dried tree fruits

South Australia is Australia's production leader in dried apricots, peaches, pears and nectarines. In 1985, South Australia produced 99 per cent of Australia's dried apricots, 100 per cent of dried peaches and nectarines and 7 per cent of prunes. Production is concentrated in the Riverland.

About one-fifth of the dried apricot production, but very little other dried tree fruit, is exported.

Because 80 per cent of the crop value and most grower interest is in dried apricots, most research and extension has concentrated on this crop. The main aim has been to improve the quality and efficiency of dried apricot production. Because crop drying techniques are similar, some findings can be applied to other crops.

Dried apricot research and extension includes development of new drying varieties; investigation of harvesting aids; research on the economics of dried tree fruit production; development of guidelines for sulphur application to fruit; and extension of research findings through dried fruit competitions and other avenues.

These activities have been developed through liaison with industry bodies and several are supported by industry funding.

Canning fruit

Total gross value of South Australian canning fruit in 1984-85 was $2.1 million, of which about 80 per cent was from clingstone peaches. About half of the total production is exported and half is sold on the domestic market.

Almost all clingstone peaches produced in the Riverland are canned although there has been a sharp reduction in clingstone peach orchards and production over the past 10 years. About 4 per cent of Riverland apricots and 50 per cent of Riverland pears are canned. Some pears are obtained from the Adelaide Hills but the greater part (up to two-thirds) is imported from Victoria. About 7 000 tonnes of tomatoes, mainly from Victoria, also have been imported for canning, as local producers are unable to supply cannery requirements.

There is only one fruit cannery in South Australia, the former Riverland Fruit Products Co-operative at Berri now owned by Berrivale Orchards Ltd. This company processes about 15 per cent of the deciduous fruit canned in Australia.

The future of the canning fruit industry in South Australia depends mainly on the prospects for the Australian industry which, in turn, depend on the world market. The industry looks toward continued stability, at least in the short term, and to the development of new products, some as alternatives to canning. This includes marketing fresh fruit in glass or plastic containers to cater for the 'health food' market.

As the Government is committed to underwriting the canning operation only until the end of the 1988 harvest, there is no incentive for growers to plant more clingstone peaches. However, should canning continue at present levels there will be a need to replace aged trees to maintain supply.

Imports are having an impact on the Australian market and are of concern to the industry. Victorian and New South Wales canners have advised Commonwealth customs authorities of their intention to provide evidence of any 'hurt' to local industry should the quantity of subsidised imports rise further.

Growers are looking to improve fruit quality to provide flexible marketing of fruit on to the fresh fruit market as well as to canning.

The Department's extension and research into canning fruit crops has been scaled down with the decline in canned fruit production. The emphasis of activities now is on pest and disease management, especially of Oriental fruit moth and brown rot, on cultural practices to ensure fruit of canning quality, on the adoption of improved irrigation practices and, in the case of apricots, on the provision of improved canning varieties. Liaison is maintained with Berrivale Orchards Ltd through the Cannery Liaison Committee.

Vegetables

South Australia's vegetable production is concentrated in four regions. The Adelaide Plains and Murray Lands are the largest, consisting of about 2 500 ha each, followed by the South East and the Adelaide Hills, each of about 1 300 ha.

The vegetable industry was worth $70.8 million in 1984-85, with the principal contributors being potatoes ($24.8 million), onions ($11.9 million), carrots ($5.8 million) and glasshouse tomatoes ($4.2 million).

Vegetable plantings increased 16.7 per cent and production increased by 24.2 per cent in the seven years to 1984, mainly because of increased plantings of potatoes, onions and carrots. Glasshouse tomato production has declined and is being replaced by capsicum, cucumber and grape production.

The South Australian vegetable industry is oriented to fresh market production. The State is almost self-sufficient in most types of vegetables and is an important supplier to markets in the eastern states.

Within the State, all produce is sold by private treaty. Vegetables are sold either through the East End Wholesale Fruit and Vegetable Market, direct to buyers (especially supermarket chains), or to processers. At the retail level, supermarkets sell 40 to 50 per cent of fruit and vegetables. The rapid increase in their share of retail sales during the 1960s and 1970s appears to have levelled off in recent years.

Negotiations to relocate the wholesale market from Adelaide city to Pooraka are well advanced.

There has been considerable growth in vegetable exports in recent years, especially of onions, potatoes, carrots, celery and other leafy vegetables, mainly to South East Asia. There is considerable potential to expand exports.

The Department of Agriculture provides research, extension and economic services to the vegetable industry. The vegetable industry encompasses a large number of crop industries and is, as a result, somewhat fragmented, making the collection of industry funds for research difficult.

Specialty crops

The economic pressures on the growers of traditional crops have created an incentive to grow alternative specialty crops. Many of the emerging specialty crops are small in total production and there are few industry organisations to cater for them. Growers are often left to represent their own interests and conduct their own marketing.

A producer's choice of specialty crops requires careful consideration of a range of factors. Market potential is the first concern followed by the likely costs and returns, soil and climatic suitability, cultural technology and packaging methods. Labour requirements and the clash of harvesting with traditional crops are also important.

Departmental activity has included the testing and assessment of a wide range of specialty crops at research centres and the extension of results to potential growers. This has involved the development of information packages, including such aspects as industry potential, gross margins and known cultural techniques.

Specialty crops under consideration as alternatives to traditional crops are pistachio nuts, avocados, cut flowers, table grapes, kiwifruit and blueberries.

The appointments of an alternative crops research officer at Loxton and an ornamental crops research officer at Northfield have strengthened research on these crops. A New Crops Working Party at Loxton draws on the horticultural expertise of many people.

Almonds

South Australia is the largest producer of almonds in Australia, producing about 80 per cent of the total crop, although production in Victoria has increased

considerably in recent years. Australian production still amounts to only about 50 per cent of the market requirement. It is estimated that there is potential to plant an additional 2 000 ha in Australia. The Australian almond industry is protected by a 12 per cent tariff against imports, mainly from the United States.

About 36 per cent of the South Australian almond crop is produced in the Murray Lands Region. The industry has been transferring from the Adelaide Plains and Southern Vales to the Murray Lands over the past 10 years. Large areas of plantings and higher yields make production more economical there than in the traditional growing areas. East of Renmark, at Lindsay Point in Victoria, some 600 ha of almonds are producing about 500 tonnes of kernel worth about $1.5 million. Production there will continue to expand as young trees reach maturity. These plantings are almost entirely serviced from and packed in South Australia.

Departmental services to the almond industry are provided by Central and Murray Lands Regions through district extension staff and research staff based at Northfield and Loxton. Recent departmental work has centred on the introduction and propagation of improved varieties and rootstocks, improvements in pollination, improved irrigation management, weed control, economic analysis of production techniques, the nutritional status of plantings, and pest and disease control. Industry provides funds for a number of research projects.

Berry fruits

The berry fruit industry is centred in the Adelaide Hills (60 per cent of production), with smaller areas on the Adelaide Plains and in the Southern Vales.

Strawberries are by far the most important crop, representing about 95 per cent of industry production. Raspberries are the next most important. Gooseberry, loganberry and boysenberry are minor crops produced by Adelaide Hills growers.

The industry is attempting to establish export markets in South East Asia and Europe. However, transport and handling problems, especially those of airport coolstore facilities and cargo space, need to be solved.

Nursery plants

During the past 20 years the nursery industry in South Australia has changed from being mainly a producer of fruit trees and vines for the horticultural industry to being a producer of ornamental plants (landscape trees and shrubs, foliage plants and bedding plants) with an estimated wholesale production of $25 million. About 75 per cent of the nursery industry is located in the central region of the State, and the major retail outlets are in the metropolitan area. There are specialist nurseries in all parts of the State.

The industry is very labour and capital intensive and specialisation in the intensive production of certain types of plants is likely to be more common in future. There is interest in and some potential for export of nursery crops.

Formal contact between industry and the Department is maintained through the Consultative Committee on Ornamental Horticulture. Research and extension initiated by the Department for the nursery industry has included management of nutrition in potting mixes and growth control of bedding plants. The ornamental horticultural officer has maintained a high profile in the industry through involvement with grower groups and through field work.

Floriculture

About 70 per cent of commercially grown flowers are raised in the Adelaide Hills, Adelaide Plains and southern districts. The remainder is produced at Murray Bridge, Renmark and Mount Gambier.

There is interest throughout South Australia in commercial flower production. The major crops are: carnations, roses, field-grown annuals and perennials, and proteaceous flowering plants. The wholesale value of production in 1985 was $14 million (excluding proteaceous crops).

Operations vary from small backyard-type enterprises to large corporately funded production units. Marketing varies from the individual grower selling to a number of florists, to consignments to wholesalers in Adelaide. Individual growers sell to other states, usually independently. There is export potential for a number of species, but the industry is directed mainly towards the domestic market.

The main trends in the industry are:

- A movement away from backyard operations to large commercial nurseries and from growing in the open to growing under some form of protection.
- A continuing search for new and improved varieties of flower crops. Growers who have come to Australia from overseas continue to introduce new methods of culture and new cultivars.
- Competition in the local market which is giving impetus to a more rational marketing system replacing direct sale to florists.
- A trend towards regional specialisation with certain crops. It is likely that South Australia will

be best adapted to produce greenhouse roses and proteaceous crops.

- A realisation that potential exists for the export of cut flowers and nursery plants and the need to pursue that opportunity.

The Department keeps in touch with the floricultural industry through the Consultative Committee on Ornamental Horticulture.

A senior research officer has conducted floricultural and nursery industry research since 1984 and provides a service to the industry on production methods, varietal selection and problem solving. This officer has also become the focus for industry coordination.

Major issues

General

- Expansion of local and export markets for a broad range of horticultural products through developing the skills of those involved in the market processes; improved post-harvest handling; ensuring freedom from pests and diseases and contaminants, and developing efficient air cargo arrangements geared to transporting perishable products;
- horticultural crop improvement to optimise productive efficiency, quality and market opportunities.
- marketing problems facing producers of canning fruits, winegrapes, dual-purpose grapes, dried vine fruits;
- possible introduction of plant variety rights;
- the integration of fresh fruit and vegetable marketing through relocating the market to Pooraka;
- lack of formal training opportunities for horticultural producers;
- structural adjustment in horticultural industries.

Specific industries

Grapes

- Structural adjustment in the winegrape industry as grape production exceeds the demand for grapes; the capacity of remaining growers to improve their productive efficiency to ensure long-term viability;
- supply/demand information and planning for the wine and dried fruit industries at regional, State and national levels;
- naming, authentication and labelling of wine on the domestic market;
- availability of finance to small winemakers;
- possible shortages of grapes in the medium to long term, particularly of specialty varieties;
- suitable incentives and alternative opportunities for those growers who want to leave the winegrape industry;
- availability of specialist table-grape information to growers, and development of table-grape markets.

Citrus

- Potential to expand domestic and overseas fresh fruit markets, improving fruit quality, and the recognition by importing countries' of South Australia's freedom from pest and disease.

Cherries, apples and pears

- Production of appropriate volumes of high-quality fruit using opportunities provided by new technology, intensive orchard management systems and regional climatic advantages.

Dried tree fruits

- Need to continue to increase productivity and product quality;
- alternative drying techniques in response to markets placing limits on sulphur levels in fruit.

Canning fruit

- Diversification of the industry into alternative end uses (including fresh fruit);
- improved quality of fruit and reliability of supply;

Vegetables
- Potential to expand domestic and export markets, new crops and products, and out-of-season crops.

Specialty crops
- Downturns in other industries leading to a requirement for technical, marketing and costs/return advice about specialty crops.

Almonds
- Expansion of the industry along profitable lines to meet domestic market requirements.

Berry fruits
- Improvement in fruit yields, firmness, carrying ability and availability throughout the year.

Floriculture and nursery industries
- Development of marketing opportunities, product quality and variety, and handling systems for long-distance transport.

Corporate goals 1987-89

Short term

Provide horticultural industries with advice and guidelines to help them make sound marketing decisions that will increase returns and avoid market gluts.

Facilitate and encourage more effective overseas marketing of horticultural products through providing advice and support to the Horticultural Export Development Committee established in 1986.

Improve the marketing of fresh fruit and vegetables in South Australia by coordinating the establishment of a new wholesale fruit and vegetable market at Pooraka.

Given the current world oversupply of citrus juice concentrate, help citrus growers expand fresh fruit and fresh juice sales by developing and promoting information programs on high-quality citrus fruit production.

With the aim of more closely approaching the production, marketing and profit potential of South Australian horticulture, redirect the horticultural crop improvement activities of the Department to give greater emphasis to high-quality production and post-harvest techniques.

Medium term

Given the adjustment pressures on the winegrape industry, develop and promote vineyard reconstruction programs and provide information on alternative crops to growers wishing to invest in other production opportunities.

In conjunction with industry, develop the potential of export marketing of table grapes through providing advice and information on cultural, post-harvest and quality-control techniques that will best meet product requirements of overseas markets.

Promote the potential of dried tree fruits through research and extension programs aimed at improving yield, product quality and lowering costs of production.

Given the demand by importing countries for lower sulphur levels in dried fruits, develop alternative drying processes and prepare and promote to growers information packages on alternative processing methods.

Assist canning fruit growers improve their long-term prospects for profitability by developing research and extension activities aimed at ensuring volume, quality and timing of fruit supplies for canning, and by promoting cultivars suited to the fresh fruit market for increased diversification of marketing opportunities.

Stimulate increased productivity in the stone fruit industries through further development of research and extension activities in new varieties, quality control, packaging and marketing for local and export markets.

Encourage the use of almonds as an alternative crop, especially in the Riverland, through extension of and research into improved planting material and production systems.

Support the growth and development of the pome fruit and stone fruit industries through crop improvement, increased production efficiency (irrigation, tree and crop regulation, pest and disease control, and post-harvest needs), and with industry identify market opportunities.

With the objective of improving services to the floricultural and nursery industries, review the prospects for integrating Government services to these industries.

In conjunction with industry and the Commonwealth Department of Primary Industry, reassess the pest and diseases regulations and standards applying to horticultural products, especially those for export.

Long term

Help South Australia maintain and improve its competitive position in horticultural production by reviewing the potential for new production areas with long-term prospects for expanding the range of horticultural products and markets.

Animal industries

The gross value of South Australian livestock slaughterings and livestock products for 1984-85 was $652 million. Recovery from the effects of drought and bushfires early in the decade has been rapid. Good seasons in the mid-1980s allowed farmers and graziers to maintain, and in some areas increase, their stock numbers.

Livestock-handling practices in all livestock industries are undergoing increasing public scrutiny. Comprehensive legislation on animal welfare has been introduced in the form of the Prevention of Cruelty to Animals Act, 1985. Regulations under this Act refer to specific codes of practice for animal management. The Department is assisting with the development and extension of codes of practice for the livestock industries, including standards for the lot feeding of sheep destined for live export. These guidelines are being developed nationally through the involvement of a range of industry and community groups and specialist committees. The Department also provides technical advice to assist the Royal Society for the Prevention of Cruelty to Animals (RSPCA) in dealing with specific animal welfare issues and investigations of alleged cruelty to animals.

The pig, poultry and dairy industries continue to experience cost pressures and scrutiny from the community on environmental issues such as the disposal of animal wastes.

There have been significant advances in artificial breeding technology in recent years. The Department has responded to these developments by updating regulatory controls on artificial breeding techniques and practices. The application of this new technology offers opportunities to all animal industries. The dairy, pig and sheep industries have shown a keen interest.

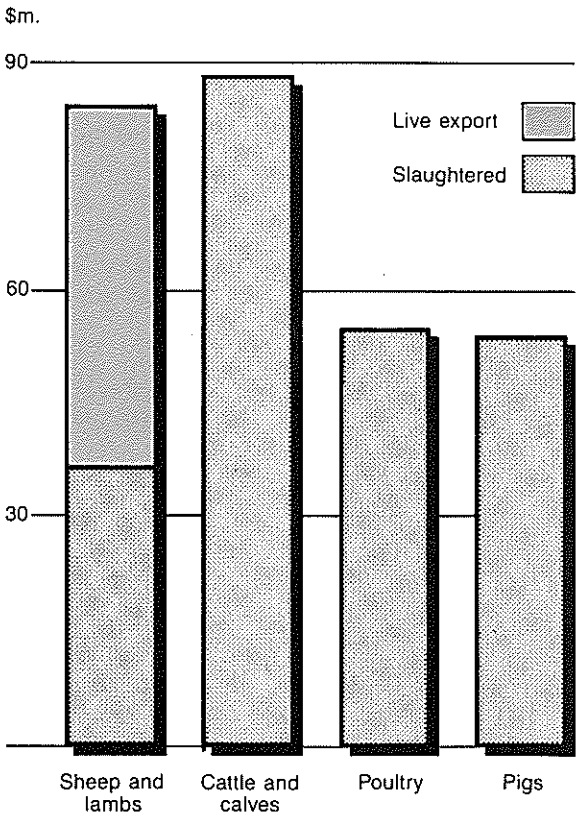
The Department provides a statewide advisory service on the health, nutrition, husbandry and marketing of food and fibre producing animals. In addition, it investigates herd and flock problems involving infectious and metabolic conditions, trace element deficiencies and parasite conditions using the diagnostic services available through the South East Regional and Central Veterinary Laboratories.

Continuing regulatory responsibilities include inspection of livestock at markets for notifiable diseases, health certification of stock for interstate movement, and supervision of on-property measures for the control of diseases such as footrot and sheep lice.

The Department administers legislation controlling the production of dairy products and meats to a prescribed standard.

Departmental livestock officers and veterinary officers also play a key role in the management of any suspected outbreak of exotic disease and the aftermath of natural disasters such as bushfires and floods.

A pastoral adviser and a sheep research officer were appointed in 1985-86 and a beef research officer will be appointed in 1986-87 to strengthen



Gross value of livestock (livestock of South Australian origin) 1984-85

Source: Australian Bureau of Statistics

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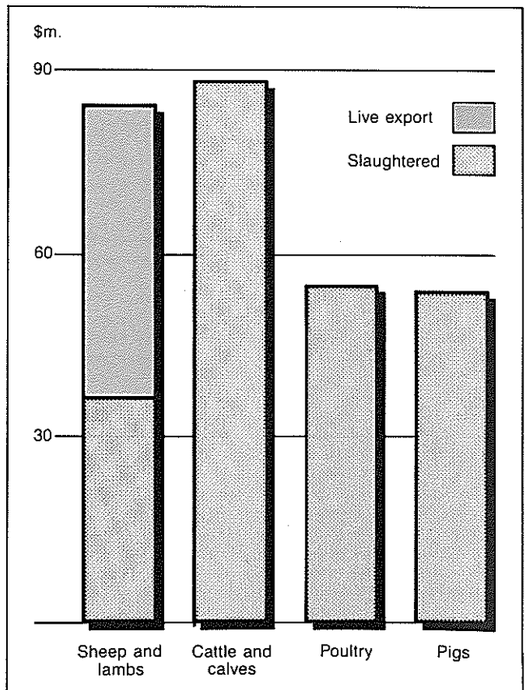


Gross value of livestock (livestock of South Australian origin) 1984-85

Source: Australian Bureau of Statistics

Sheep

The South Australian sheep population was estimated by the BAE to reach 17.5 million by March 1986. Recovery after the drought and disastrous fires of 1982-83 has been rapid and reflects the effect of having a high proportion of ewes in the State's flock.

Following the recovery from the drought, the production of mutton is expected to increase during the mid-1980s because of high adult turn-off. This may result in an increase in consumption of mutton on the domestic market while depressed conditions prevail on the export market.

Factors such as lower grain prices and the high cost of farm machinery may cause some farmers to re-examine the options available to them, including moving from grain growing into wool and sheep-meat production.

The increase in the floor price market indicator for wool to 500 cents/kg clean announced by the Australian Wool Corporation (AWC) for the 1985-86 selling year, has provided the necessary incentive for growers to maintain sheep numbers on farms. However, real average price increases are not expected over the next few years.

Sale by additional measurement is being strongly promoted by wool brokers. The AWC has recorded a positive response from wool producers. Producer support will grow further as buyers clearly express a preference for wool described in terms of fibre strength, length, colour and position of break. Such information is being catalogued and buyer confidence is growing. Departmental staff will be involved in conducting education programs with the AWC and wool brokers until the majority of wool lots are sold with additional measurements catalogued.

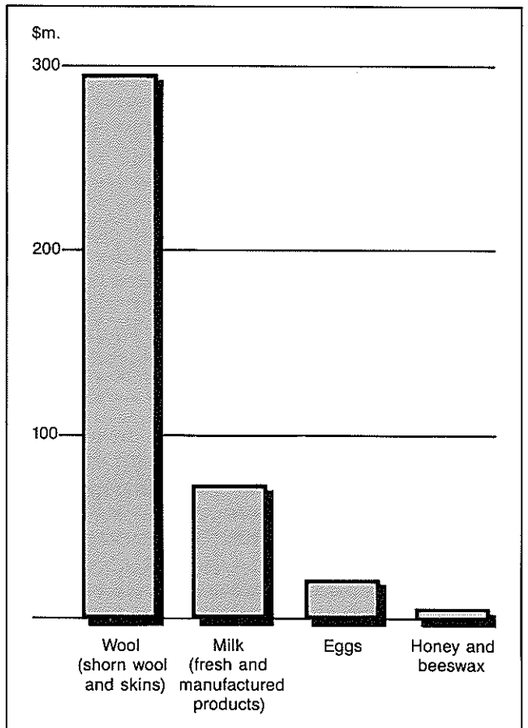
The Department's extension role in the industry continues through detailed monitoring of sheep management on properties, including shearing shed management, wool handling, wool classing and sheep selection, and participating in field days throughout the State. Nutrition and management advice are important components of livestock extension.

Live sheep exports are, after wool, the major export earner for the South Australian sheep industry. In 1984-85 the value of live sheep from South Australian ports was more than $60 million. In contrast, lamb exports were worth less than $8 million and mutton exports around $24 million. A recent development in the live-sheep trade has been the writing of contracts with South Australian producers for the production of entire ram lambs. Existing wharf facilities for loading live sheep in Adelaide are being examined with a view to establishing upgraded facilities that are efficient and ensure the health and well-being of the sheep. Departmental staff are involved in the inspection of stock pre-export to ensure health and welfare standards are maintained.

Sheep diseases under regulatory control by the Department include footrot and sheep lice. Ovine brucellosis is covered by a voluntary accreditation scheme involving 50 per cent of stud flocks; interest in the scheme is growing.

The results of a field survey of 319 properties in the South East and Central regions of the State in 1985 showed 1.6 per cent of properties with footrot and 16.3 per cent with footscald. These results indicate that the current footrot control program is effective. A number of types of the causal organism were cultured from sheep as part of the survey. No relationship was found between the organism type and the severity of the foot lesions produced.

Sheep research is conducted at Turretfield, Struan, Kybybolite, Minnipa, Northfield and Wanbi



Gross value of animal products 1984-85

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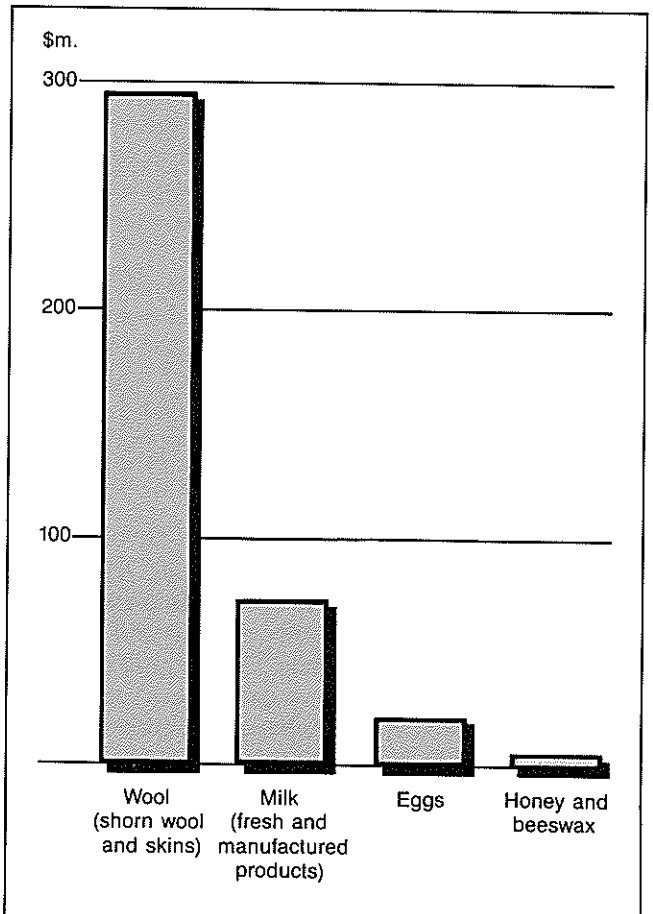


Gross value of animal products 1984-85

Source: Australian Bureau of Statistics

Research Centres but will be consolidated over time into two centres of sheep research excellence at Turretfield and Kybybolite. A property at Cape Borda has also been leased for the purposes of conducting a specific research project which will be completed by 1987.

Beef

The number and value of cattle slaughterings in South Australia rose rapidly in the late 1970s to over $100 million a year. In recent years higher beef prices have held this figure between $100 million and $135 million.

Beef cattle numbers have increased by about 5 per cent a year since 1983 to 684 000 head in 1985. Any further increase in cattle numbers will depend on cattle prices and relative returns from cereals and sheep. If cattle prices remain firm it is predicted that the State herd will continue to increase at the present rate.

The high-rainfall, permanently pastured areas of the State (Adelaide Hills and the South East) carry about 65 per cent of the State's cattle. Numbers of cattle in the cereal belt remain static and the pastoral area reported a 20 per cent increase through restocking and herd build-up following the success of on-property programs to eradicate bovine brucellosis and tuberculosis.

Most beef cattle are sold on a per head basis at auction or by direct sales on the property. There has been no noticeable move towards sale on a carcass weight basis despite the availability of facilities and legislation.

The industry is strongly supporting the AUS-MEAT language which provides for standard description of livestock, and CALM (Computer Aided Livestock Marketing). Both of these initiatives are being implemented with the support of the Department. If successfully adopted, they will revolutionise beef cattle marketing in South Australia.

The Department continues to be involved in planning and implementing research and extension that will assist producers with determining the most profitable use of farm resources in the cereal/grazing regions of the State. Departmental beef cattle extension covers all areas of production with an emphasis on nutrition, breeding and marketing.

When major cattle projects at Turretfield and Wanbi Research Centres are completed, beef cattle research will be centred at Struan Research Centre. Research programs include crossbreeding and nutrition. The benefits of cross-breeding in beef production are promoted through extension programs. The future of research with an on-farm application will depend on the continuation and extent of funding by industry bodies such as the Australian Meat and Livestock Research Development Corporation.

South Australia has made excellent progress with the national campaign to eradicate brucellosis in cattle. This program is aimed at improving productivity in herds, protecting access to overseas markets and safeguarding human health. All areas of the State now have a very low prevalence of disease and there is a target of no infected properties by the end of December 1987. Restocking of properties in the pastoral north, which were either partially or completely destocked as part of the eradication program, has been helped by the provision of a freight rebate that partially subsidises transport costs.

Other cattle diseases, such as Johnes disease and trichomoniasis, are under regulatory control by the Department and investigations are carried out by animal health staff where nutritional, parasite and herd disease problems are referred by private veterinary practitioners or where no private veterinary services are available in the area.

The Cattle Compensation Act was amended in 1986 to allow more flexible use of funds. The primary use of funds remains the compensation for diseased stock. However, some money can now be directed into research and other activities that have a benefit to the industry. This also applies to the dairy industry.

The Department administers the Meat Hygiene Act under which meat inspection and building standards ensure that meat products are of a prescribed standard.

Dairy

The main dairying regions are the Adelaide Hills, Fleurieu Peninsula, River Murray Swamps, Lakes irrigation areas and the South East. The minor dairying regions are the Mid North, Eyre Peninsula and the Riverland.

The gross farm-gate value of South Australia's milk production was estimated to be $70.4 million in 1984-85. Including the added value of manufactured products and cattle slaughtered, this represents a gross value of the dairy industry in South Australia of about $150 million.

Milk production in Australia has continued to increase with South Australian milk production in 1984-85 being 372 million litres, or 6.2 per cent of Australia's production.

Since the release of the Industries Assistance Commission Report on the Dairy Industry in November 1983, the industry has been involved in

discussions with State and Commonwealth Governments on new marketing arrangements. The Commonwealth Government has introduced arrangements that applied from 1 July 1986. These involve a levy on all milk to provide direct support for exports and to place greater marketing pressure on the industry to find the best possible market for dairy products.

Prices for dairy products on the export market are depressed because of world oversupply. This has meant lower returns for Australian producers at a time when national milk production is increasing. The national marketing arrangements introduced in 1986, the long-term effects of the Closer Economic Relations Agreement with New Zealand and the increasing threat of interstate trade in market milk are all factors that will affect the viability of producers in the industry.

At a State level, legislation has been enacted to provide for equitable sharing of returns from metropolitan market milk sales between farmers in the Metropolitan Milk Board area and the South East.

The Department has roles in administration of the Dairy Industry Act and Regulations, extension of and involvement in the Australian Dairy Herd Improvement Scheme and the State Herd Recording Scheme, extension, policy advice and research work relating to the dairy production and processing sectors of the industry. The Australian Code of Practice for Dairy Factories has been revised and will incorporate codes of hygienic practice for specific product manufacture. Dairy manufacturing in South Australia has consolidated over recent years into three large enterprises.

The dairy extension function carried out by regional staff is mainly conducted through farmer discussion groups. Emphasis is placed on the better utilisation of pasture and conservation of better fodder, reducing farm operating costs, other financial considerations, mastitis control, dairy farmer education and liaison with industry organisations.

Dairy production research is concentrated in the areas of nutrition and grazing management and genetics and reproduction. The quality and utilisation of dairy pastures will become an increasingly important priority. Techniques of embryo transfer and embryo splitting are being developed. Dairy technology research has been directed at the milk-processing industry, mainly cheese manufacture, and quality control of milk and milk products. Emphasis has been on the practical benefits for cheese manufacture of using milk from cows with superior milk protein genotypes.

Dairy production research now done at Northfield will be transferred in the near future to a new research centre to be developed in the southern hills.

Pigs

The South Australian pig industry has a farm-gate value of about $62 million and, with 45 500 sows, represents 13 per cent of the national herd. The industry is concentrated around the Gawler and Murray Bridge areas; 70 per cent of pigs are within 100 km of Adelaide.

The State is a net exporter of pig meat to other states (mainly to Victoria and New South Wales) and locally uses four main market systems: live auction, sales direct to abattoirs, pig sales by classification, and on-property sales. Sale by classification continues to provide the most widely quoted price for pigs. Industry initiatives towards the development of a national electronic sale system for pigs are being supported by the Department.

The industry established a Boar Testing Station at Clare in 1986. Its function is to identify the superior sires from within the State herd and provide their genes to industry through artificial insemination. This facility complements the Department's pig improvement program, which involves on-farm testing of livestock to identify superior potential breeders. Recording of piggery performance, both physical and financial, is provided through the Pig Management Recording Service. Cash flow and budgetary processing is in demand as the industry becomes more intensive and highly capitalised. The ration formulation service continues to be recognised as a major extension role of the Department.

Producers and the community are now placing greater emphasis on specialised housing and the acceptable disposal and use of piggery waste. The Department provides extension advice on these issues.

Research is concentrated on health, nutrition, physiology and reproduction, and is mostly conducted at the Northfield Pig Research Unit. Representatives of the stud and commercial sections of the pig industry have contributed greatly to the management and research priorities of the Unit since its inception. Regular industry seminars are held. Projects of particular interest to industry are the evaluation of the nutritional value of grain legumes, studies on the reduction of early embryonic mortality, and a pilot pig health scheme based on the abattoir monitoring of carcasses to determine health status and problems on the farm of origin. A general herd health advisory service complements the services of private veterinarians.

Poultry

The main poultry enterprises in South Australia are the production of table eggs and chicken meat. About 13 million dozen eggs with a gross value of $22.5 million and 30 million meat chickens with a gross value of $54 million are produced each year. Small numbers of turkeys, ducks, quail and pheasants are also produced.

Egg production is regulated by quota legislation and about 450 registered producers keep between 600 000 and 800 000 quota hens. The number of hen quotas being used varies since hens may be taken out of production from time to time when oversupply is likely to become a problem.

The chicken meat industry in South Australia is dominated by three companies who operate processing plants and hatcheries; they also produce their own hatching eggs. Most of the meat chickens are grown by about 70 growers who have contracts with these companies. The contract generally stipulates that the company will supply day-old chickens, feed, vaccines, medication and management advice but retain ownership of the birds. The grower provides labour, housing and equipment to prescribed standards.

Chicken-meat production is regulated under the Poultry Meat Industry Act which is administered through the Poultry Meat Industry Committee. This committee includes representatives from processing companies, contract growers and the Department.

The Department provides a range of health and husbandry, extension and regulatory services to the commercial poultry industry. Poultry disease investigations are carried out in cooperation with the Central Veterinary Laboratories.

Parafield Research Centre is the focus for poultry research in South Australia. It also houses the industry-supported Poultry Genetic Conservation Trust. Research is mainly related to husbandry practices, egg shell quality and genetics.

Bees

South Australia has 1 276 registered beekeepers owning 97 285 hives. Of the registered apiarists 12 per cent collectively own 70 per cent of the total hives. The South East region of South Australia produces 60 per cent of the honey.

The Department advises the industry on all aspects of apiculture and administers the Apiaries Act under which apiarists must register with the Department every three years. The Act also empowers the Department to control certain bee diseases.

In 1984 a Honey Bee Compensation Act came into force. Under this Act, a fund has been established into which a duty on each hive is contributed.

Compensation payments may be made to owners whose hives are compulsorily destroyed because of certain diseases. The effect is to encourage reporting of disease and therefore encourage disease control, as well as assist with financial losses. There were several outbreaks of American foul brood in 1985, in one instance necessitating the destruction of over 600 hives.

South Australian beekeepers regard salvation jane as an important honey source. The recent recommendation for the biological control of salvation jane by the Industries Assistance Commission has caused considerable concern in the industry.

Goats

The Angora and Cashmere goat industries have been boosted by extravagant purchases made by New Zealand. The New Zealand Government has provided financial incentives to their farmers to adopt alternative livestock enterprises such as mohair and Cashmere fibre production. Whole herds have been sold to New Zealand as a result.

It is difficult to predict the long-term future of the Cashmere and Angora industries with any certainty.

Deer

There is growing interest in deer farming in South Australia, mainly as a secondary enterprise. It is estimated that there are a total of 5 600 deer in about 200 herds throughout the State. This includes feral animals as well as those kept under control on properties for commercial production of venison and velvet.

Fallow deer are the most common, accounting for 80 per cent of the State deer population.

Veterinary laboratory services

Veterinary laboratory services are directed towards providing a diagnostic service to clients and solving problems of health and production in farm livestock and in zoo, sport, companion, native and exotic animals. The laboratories carry out diagnostic testing, and engage in research and development programs. Information gathered is collated to provide data and advice on animal health problems to the public and the private sector.

The services are provided from the Central Veterinary Laboratories on the Institute of Medical and Veterinary Science (IMVS) campus in Adelaide,

from the South East Regional Veterinary Laboratory at Struan in the South East, from IMVS regional laboratories and from the Gilles Plains Animal Resource Centre. A close contact is maintained with other related laboratories, notably the Australian National Animal Health Laboratory at Geelong.

The Department offers diagnostic and consulting services in bacteriology, biochemistry, haematology, immunology, parasitology, pathology and virology to veterinarians in private practice, departmental staff, and State and Commonwealth Government and semi-Government instrumentalities. There is continuous development of improved and more economical testing procedures in all disciplines. A statewide quality control program has been introduced in which all laboratories offering a veterinary diagnostic service participate.

Some 350 000 individual tests are performed each year from a range of 250 tests available.

In addition, a wide range of research is conducted into problems as varied as:

- annual ryegrass toxicity (ARGT) in sheep;
- the control of leptospirosis in the dairy and pig industries;
- methods of detection and prevention of trace element deficiencies in livestock;
- the helminth and protozoan parasites of domestic and wild animals.

Of the tests conducted at the laboratory, 70 per cent of diagnostic work concerns specimens from farm animals. Significant components of this work are the Brucellosis and Tuberculosis Eradication Scheme, quarantine and export testing, and the maintenance of an ability to respond to an outbreak of exotic diseases.

Major issues

The main issues that will need continued attention by the Department, livestock industries and producers include the following.

General

- Changing community perceptions of dietary requirements for good human nutrition and health;
- consumer demand for continuity of supply of quality meat products;
- identification and maintenance of overseas market outlets for red meats and dairy products in the context of increasing competition from the EEC;
- improved systems for marketing animal products that increase domestic consumption of these products and lower the cost to the producer;
- adoption of animal husbandry practices that, while optimising productivity, are consistent with the health and well-being of livestock. Continued development of codes of practice for animal industries;
- control of disease and conditions that may limit animal production with emphasis on establishing a national epidemiological monitoring service;
- land use planning and environmental constraints on siting intensive animal houses. Need for coordination of Local and State Government advice on planning decisions;
- grazing techniques to minimise soil erosion;
- grazing stategies and selection of pasture species to offset the seasonal fluctuations in the feed supply for grazing animals;
- development of animal management strategies in the pastoral zone which are consistent with the long-term maintenance of the natural resource;
- the benefits of importing improved genetic material in the face of the risk of introducing exotic disease;
- objective measurements for breeding and selection of livestock;
- the use of an increasing range of agricultural and veterinary drugs and chemicals in animal production and increasing community concern about residues in animal products;
- eradication of bovine brucellosis and tuberculosis from the State herd.

Specific industries

Sheep and goats

- Management strategies to optimise farm returns from integrated sheep production and cropping;
- nutrition, management, health and welfare of sheep and goats for the live sheep and goat export trade;
- sale and export of Merino genetic material.

Dairy

- Impact of new national marketing arrangements;
- adjustment pressure on the South Australian dairy industry with increasing on-farm production costs and reduced world market opportunities;
- overproduction of fat which may lead to increased pressure for a change in the basis of payment for milk from butterfat to protein;
- equitable returns to producers from the South Australian whole-milk market.

Pigs

- Competition from imported frozen pork;
- genetic improvement of pigs to increase growth feed conversion rates and carcass quality.

Poultry

- Provision of a cost-efficient egg marketing system;
- consistent supply of quality young stock to independent egg and meat producers.

Bees

- Eradication of American foul brood;
- alternative sources of nectar in the light of the imminent biological control of salvation jane;
- the limiting of commercial honey sites in national parks.

Deer

- The bovine tuberculosis status of deer in the State and the possibility of its transfer to cattle.

Veterinary laboratory services

- Responsiveness to disease emergencies such as exotic diseases;
- effective cost recovery for services provided to clients.

Corporate goals 1987-89

Short term

Improve and co-ordinate the technical training provided to regionally based staff so that the needs of animal industries can be better met.

Review legislation affecting the egg industry with the aim of improving the mechanism of adjusting the supply of eggs to meet market demand.

Improve the basis of decision making in dairy marketing and policy development by constructing a model of the South Australian dairy industry to give farmers, processers and Government a means of collating and interpreting industry data.

Improve interpretation of the pattern of livestock disease incidence in South Australia by upgrading the epidemiology information base with the appointment of a senior epidemiologist.

Medium term

Achieve Declaration of Impending Freedom from Tuberculosis in cattle and Freedom from Brucellosis in cattle in South Australia by December 1987.

Develop the Department of Agriculture's role in animal welfare under the Prevention of Cruelty to Animals Act, 1985 and implement an appropriate statewide education program for animal industries consistent with approved codes of practice for animal welfare.

Facilitate the adoption by the meat industry in South Australia of industry-based initiatives to improve livestock marketing, especially AUS-MEAT language and Computer Assisted Livestock Marketing (CALM).

Help address community concerns about straying animals by assisting the Department of Local Government to complete a review of the Impounding Act 1920 and prepare guidelines for drafting new legislation in cooperation with the Department of Lands and the Local Government Association.

Evaluate and, if appropriate, apply biotechnological advances in animal breeding and production to the benefit of livestock production and research in South Australia.

Improve the preparation and productivity of stock in feedlots, especially of stock for live export, by providing technical advice consistent with the health and well-being of the animal to managers of sheep and cattle feedlots.

Long term

Define the most effective breeding objectives and selection criteria for use by the beef cattle, pig and sheep industries through application and development of existing and new methodology using economic, phenotypic and genetic parameters relevant to South Australian livestock industries.

Agricultural resource management

Urban, agricultural and economic developments continue to place pressure on the State's land and water resources. The main purposes of this program are defining land capability, maximising the use of resources for sustainable economic production, effective extension of land management principles and the protection of crops and livestock from plant and animal pests and diseases.

Soils

Conservation of the soil resource is an important concern. Soil degradation can occur through wind and water erosion, salination, acidification and soil compaction and can be accelerated by poor farming practices.

Change in traditional farming systems in South Australia over the past decade to more intensive cropping and a decline in the pasture phase of rotations has placed more pressure on the land. Greater use is being made of nitrogenous fertiliser where leguminous pastures have declined because of aphids. In some districts the use of grain legumes in rotations has enabled more intensive cropping to succeed.

In addition, the use of bigger and more sophisticated machinery has led to increased speed of cultivation and larger areas of land being cropped. This could increase the likelihood of erosion and soil degradation, especially where cropping has been extended to erosion-prone land such as steeper slopes and sandier soils, without sufficient consideration of the suitability of the land for intensive cropping.

The cereal areas most at risk from erosion and soil degradation are the red-brown earth zone of the Mid North and the sandy farming areas of the Murray Mallee and Eyre Peninsula. There is now greater need than ever to use conservation farming methods and to install contour banks on hilly cropping land. An essential part of this strategy is the use of stubble as trash to protect the soil from wind and water erosion.

Dryland soil salinity, once considered to be a minor problem, is now causing concern on Eyre Peninsula, Yorke Peninsula, Kangaroo Island, the Mid North and the Upper South East. An estimated 55 000 ha is affected in the agricultural districts of the State. Investigations into ways to mitigate the problem are continuing.

Funding of soil conservation increased substantially with the introduction of the Expanded Soil Conservation Program in 1982 and the National Soil Conservation Program in 1983. This has enabled the Department to embark on an extensive program of demonstration, promotion, training and research.

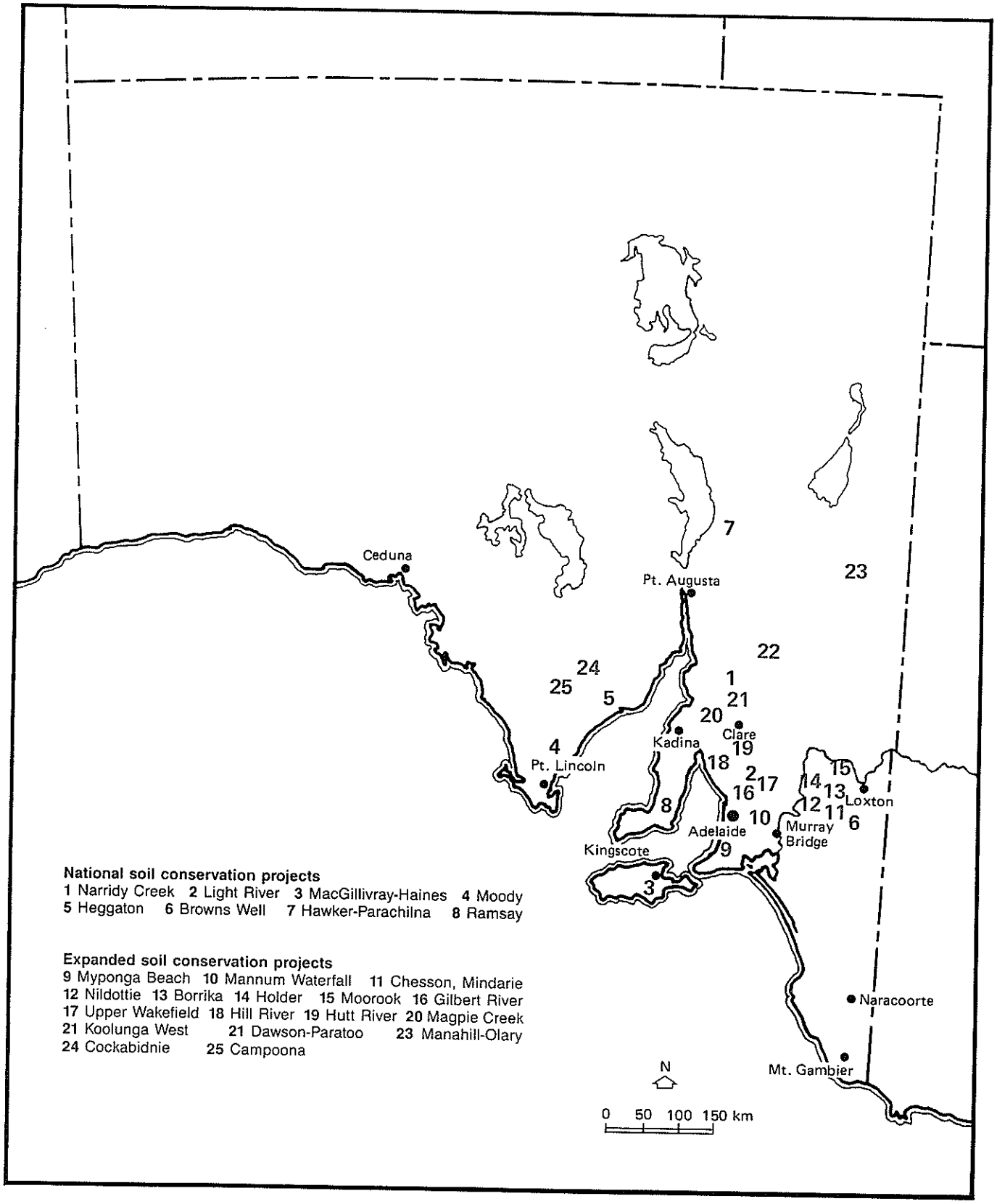
The National Soil Conservation Program (NSCP) encompasses several goals. A major goal is that all lands be used within their capability. A project has been funded to develop land capability assessment criteria and provide a methodology for predicting the extent and severity of soil degradation in agricultural districts of the State. The Department also advises the Native Vegetation Authority, which comes under the Native Vegetation Act, 1985, of the suitability of land under native vegetation for agricultural use on a permanent basis.

Another NSCP goal is that land use and land management decisions be based on whole catchment/regional land planning concepts. The Department is involved in the promotion, planning and adoption of conservation management practices in 23 catchment/regional project areas, together comprising about 750 000 ha.

Demonstration projects have been established as group catchment schemes in which groups of farmers address degradation problems and carry out control measures for wind and water erosion and the reclamation of saline areas. The range of control measures includes revegetation and the construction of soil protection structures.

The Department believes that soil conservation is most effectively achieved through education and cooperation with landholders. Particular emphasis is placed on involving landholders through a system consisting of a State Advisory Committee on Soil Conservation, eight district soil conservation boards, local committees and group demonstration schemes. The boards and committees are made up of landholder representatives.

Technical support is given to this system of committees and boards, and directly to farmers, for design and survey of earthworks, research into tillage methods, crop rotations, pastures, fertilisers,



Location of group projects 1986

land resource mapping, reclamation of saline areas, and extension programs to help landholders adopt sound land management systems.

Medium-term and long-term research is continuing in the Mid North and Murray Mallee to evaluate farming systems with different cropping intensities and various tillage systems. Research is under way to determine which farming operations are most vulnerable to erosion and the financial cost to the farmer of soil loss and soil degradation.

Improved soil and plant tissue analysis services have been introduced to give farmers the information needed to determine fertiliser requirements.

Information is being distributed throughout the community and especially to schools, drawing attention to soil conservation issues and the strategies being developed and implemented by landowners throughout the State.

Water

Community attention has been focused on the State's limited water resources and water quality because of increasing demands by urban and rural users. There is a continuing demand on the Department by farmers and Government departments for technical and economic appraisal of irrigation systems, crop water use requirements and irrigation methods. Research programs have been established to provide information towards the development of water allocation policies by the State Water Resources Council for underground water resources. Crop water use is a critical aspect in determining water management strategies where agriculture is a significant user of water. Areas of concern are Tatiara, northern Adelaide Plains, the ground water resources extending across South Australia/Victoria border, and the Angus/Bremer region.

Specialist departmental staff help farmers with site selection, survey and construction of irrigation and farm dams, and layout of water-harvesting projects. A similar service is available to advise farmers on the efficiency and costs of various irrigation practices and to assist in the design and survey of irrigation projects.

Irrigation salinity is a major threat to the State's horticultural industries. The River Murray Irrigation and Salinity Investigation Program has completed investigations on irrigation practices, crop water requirements, and salinity and water quality standards in the Riverland. Advice on these issues is being given to Riverland irrigation farmers to enable them to manage the water resource and minimise land degradation.

Departmental staff work with the Department of Environment and Planning and Local Government authorities, advising on the control and management of agricultural pollution from intensive animal production units and the safe and economic use of effluent water.

The Department is becoming increasingly involved in the planning and management of the watersheds of Adelaide's metropolitan reservoirs. This is an inter-departmental, multi-objective planning exercise where the promotion and adoption of conservation management practices has been identified as a major component for the control of non-point source pollution of South Australia's water resources.

Research on the pollution potential of intensive agriculture is continuing in the Piccadilly Valley in the Adelaide Hills. This valley is being studied to measure the quality and sediment load of surface runoff waters that eventually reach Mount Bold reservoir. Alternative methods of land use management that have the potential to control soil erosion, siltation and nutrient loss from agricultural land are being investigated and extended.

Vertebrate pests, pest plants and locusts

Pest animals, pest plants and locusts are a constant and recurring threat to the State's crops and livestock.

Staff of the Pest Plants Commission and the Vertebrate Pests Control Authority have been combined into a single branch. Draft legislation has been prepared for the amalgamation of the Pest Plants Commission and Vertebrate Pests Control Authority and this will greatly help State and Local Government to integrate the control of animal and pest plants throughout the State.

The proposed legislation would extend to the Department the responsibility for the control, entry, movement and keeping of non-indigenous vertebrate species beyond the present declared species. Consequently, the range of activities of the Department would be expanded. The aim is to prevent exotic animals and birds from becoming established in the environment rather than attempt to control them after they become established. The introduction of unusual exotic animals with potential for economic use, such as the alpaca, will come under this legislation.

The recently passed Federal Biological Control Act with its complementary State legislation has now paved the way for the introduction of biological control agents for weeds that would otherwise be very difficult to control. This legislation has proved to be necessary where conflicting interests have

been involved in the decision to control a particular weed. Salvation jane is an example. Other weeds will be assessed for suitability for biological control.

The emphasis in pest control research is changing in response to changing community perceptions, in that:

- pests are no longer being perceived as only those that affect agriculture, but now include those that affect the natural environment;
- it is no longer assumed that pest control implies eradication. It may include maintaining numbers at acceptable levels;
- management of feral animals (goats and pigs) is assuming greater importance as is the management of certain native species, including galahs, corellas and hairy-nosed wombats.

The emphasis is on promoting a cooperative approach to pest animal and pest plant control by State Government, Local Governments and landholders through the established framework of local pest control boards.

Activities include:

- Trials on alternative ways of keeping dingo numbers at acceptable levels, given the continued deterioration of the dog fence. Trials with electric fencing have been carried out along with increased baiting.
- Control and ultimate eradication of golden dodder from the Upper Murray River and adjacent areas.
- Continuing vertebrate pest research into the biology and control of rabbits, the control of feral goats and the house mouse in relation to cereal crops.
- Constant monitoring of plague locust and plague grasshopper populations.
- A regular updating of information available to pest control boards about pest control methods.

Quarantine

Overseas trade, expanding tourism and rapid transport provide countless opportunities for the entry of plant and animal diseases from overseas and other states. The need for maintaining vigilant quarantine services is now greater than ever before, especially because of the increasing use of Adelaide International Airport for receiving direct imports from overseas.

Between the states, the spread of animal diseases is minimised by the requirement for livestock entering any state to be accompanied by health certificates appropriate to the species.

External quarantine is a labour-intensive Commonwealth/State responsibility operated by the Commonwealth Department of Primary Industry, using the services of staff managed by the State for many of the tasks. It requires daily inspection of plants and animals and suspected disease-carrying materials at airports, seaports, roadblocks, railway terminals and postal customs. Departmental staff have to be able to identify exotic plant and animal diseases.

Plant quarantine on South Australia's borders is mainly directed at preventing the introduction and establishment of plant diseases and pests (such as fruit flies) that occur in other parts of Australia.

Similarly, the provision of certification of the health status of exported live animals, plants and plant products is a substantial and valuable task undertaken by State officers on behalf of the Commonwealth. Such certification facilitates the entry of South Australian primary products into the markets of the world. Animal and plant import/export inspection premises are being relocated within Port Adelaide to provide a more effective client service.

Agricultural and veterinary chemicals

The prime objective of the various measures carried out by the Department is the safe and efficient use of chemicals and the avoidance of hazards to non-target species, the user and the environment.

With the proliferating range of agricultural chemicals and veterinary medicines, one of the farmer's main concerns is to determine which chemical to use, how to use it, and its level of safety. Regional staff integrate information about the choice and safe use of chemicals into regional programs.

All agricultural and veterinary chemicals must be registered and must comply with labelling and quality requirements before release. Sampling and testing of registered chemicals for conformity with the label claims and formulations, and investigating problems following misuse of products are functions of the Department's Agricultural and Veterinary Chemicals Unit. This Unit also checks samples of foodstuffs for chemical residues and, in association with the agricultural chemistry industry, provides a service for the testing of herbicides.

The Department has made available the senior officer responsible for registration to three successive International Consultations on Registration of Veterinary Products, to represent the interests of the States. He has been appointed international president of this organisation, and Australia will host the 1988 Consultation.

Major issues

General

- The need for continued development and adoption of soil and water management practices with emphasis on management for long-term productivity as well as short-term profit;
- land use planning, especially in the peri-urban and catchment areas, where there are competing demands and conflicting objectives;
- community pressure for farmers to maintain natural resources for future generations.

Specific issues

- Susceptibility of a large area of the cropping zone in South Australia to water and wind erosion;
- widespread adoption of intensive farming systems and the associated potential for soil and water degradation unless appropriate management practices are used;
- dryland salinity especially in the Eyre, South East and Central regions;
- water-repellent soils on Eyre Peninsula and in the Upper South East causing major difficulties with crop and lucerne pasture establishment;
- the development of soil acidity in high-rainfall zones. The South East and the Adelaide Hills are affected;
- the impact of agriculture on the maintenance of the State's water resources; main concerns are River Murray salinity, agricultural pollution of surface runoff water and salination of underground basins;
- grower adoption of sound irrigation practices;
- the need for more efficient use of scarce water resources;
- the control of golden dodder in the Upper Murray areas of the State and its eradication from lucerne-growing properties to protect South Australia's lucerne seed and lucerne hay industries;
- effective control of pest plants in the northern pastoral zone and the Flinders Ranges, for example prickly pear and African rue;
- biological control of weeds in field crops and pastures;
- control of dogs, rabbits and goats in the pastoral zone where there is little economic incentive to encourage control by producers;
- expanding international transport and travel and the consequent need to maintain an efficient and vigilant quarantine service to protect Australia's agricultural industries and the Australian economy;
- incomplete information about the spread and severity of some pests and diseases in South Australian crops and the possibility of accidental introduction of exotic pests and diseases. This information needs to be established so that authoritative statements about pest and disease status can be made and used to assist in gaining entry to overseas markets;
- the increasing use and range of agricultural and veterinary chemicals with implications for maintenance of regulatory standards and provision of advisory services to potential users;
- safe and responsible storage and use of chemicals;
- education of regional disaster personnel of the Department and other organisations in the characteristics and safe disposal of agricultural chemicals;
- the unavailability of some land to agriculture because of competing land-use demands.

Corporate goals 1987-89

Short term

Help farmers maintain the long-term productivity and profitability of South Australia's cropping land by researching and developing management strategies to minimise water and wind erosion, dryland salinity and soil acidity.

Encourage greater adoption of soil conservation technology and practices through extension activities and demonstration projects that promote and illustrate their effectiveness.

Provide advice to the Native Vegetation Authority and farmers on the degradation hazard of clearing land under native vegetation.

Medium term

Develop and implement strategies to control golden dodder for the protection of the lucerne seed and hay industries.

Help protect natural resources in the Far North by developing and implementing strategies to control pest plants and animal pests in the northern pastoral zone and the Flinders Ranges.

Identify pests and diseases of plant products not acceptable to export markets and monitor their presence in South Australia so that, if required, effective measures can be taken to eradicate them or contain them at levels acceptable to overseas importers.

Encourage the safe use of agricultural and veterinary chemicals by providing advice to farmers and other handlers and users of these chemicals.

Encourage wider adoption of more efficient irrigation practices to help improve water quality and reduce costs through the provision of district advisory services and support of the Irrigated Crop Management Service.

Develop agricultural and horticultural land capability criteria and management guidelines for regions of the State where land-use conflicts exist.

Long term

Contribute to the development of rational and coordinated Government policies on land management through fostering improved communication and consultation with other State and Local Government agencies and community groups.

Farm management and rural community support

The farm management and rural community support program describes a range of services the Department provides to the rural community. These services are integrated across conventional industry and regional boundaries and focus on economic and social aspects of modern farming rather than on technical agricultural aspects. The program is aimed at improving the economic efficiency of individual farms and the social well-being of the farming community.

Farm management outlook

The need for efficient management and husbandry on South Australian farms has never been greater.

Farm costs are rising by eight to ten per cent a year and this is expected to continue into the late 1980s. Export-oriented production in the cereal and dairy industries and those vulnerable to cheap imports, such as the grape growing and citrus industries, is likely to achieve lower market returns.

The BAE has estimated that in 1984-85 the number of farms in South Australia at risk, that is those that had a negative cash margin in 1984-85 and an equity of less than 70 per cent, was 800 (4 per cent). The Department predicts that the number of farms at risk will increase to 2 000, or 10 per cent, in 1986-87, and that a further 5 000 farmers will also be forced to increase borrowings in the two years to 1988. The greatest financial problems will be experienced by cereal and fruit growers. This may cause the rural debt in South Australia to rise from $600 million in 1984-85 to $1 000 million in 1986-87. Debt servicing is a major farm cost on at least half of South Australia's farms and is especially so for the 20 to 25 per cent of farms carrying a debt of more than $100 000.

Land prices fell by 10 to 30 per cent in 1985-86, and land prices will remain low while rural industries are depressed and interest rates high.

Rural affairs

The Department recognises the adverse trends in agriculture and their economic and social impact on industry, farming families and communities.

The Department is reviewing its socio-economic activities, such as research into the impact of economic change on farm families and rural communities, development of programs for structural change at industry and regional levels, and provision of farm management and other services. The purpose is to develop strategies and programs that address the efficiency and welfare needs arising from structural change.

Extension and rural education

The Department provides a range of extension and rural education services. Regional extension officers with expertise in, for example, agronomy, soils, livestock and farm business management, work in multi-disciplinary teams from regional and district offices with specialist back-up from the Department's Animal Services and Plant Services Divisions in Adelaide. Traditionally, technical and economic advice has been given to individuals and groups on demand. While this will remain an aspect of the Department's extension service, increased emphasis will be placed on the identification of district and industry needs, and the delivery of appropriate extension programs.

The Department provides support for many agricultural education programs throughout South Australia through rural studies courses initiated by the Department of Technical and Further Education (DTAFE) and by providing lecturers to other institutions, including Roseworthy Agricultural College and the University of Adelaide.

The Community and Home Gardens Advisory Service is a sales and distribution outlet for departmental publications and a public inquiry service. The Department continues to produce more than 450 fact sheets and bulletins that are regularly updated. In addition, departmental journalists issue news releases and feature stories to the rural media. In regions, increasing use is being made of the local media with feature articles and seasonal reminders on various aspects of farming.

Departmental assistance to groups such as the Women's Agricultural Bureau, the Rural Youth Movement, the Agricultural Bureau and the South Australian Rural Advisory Council enables these organisations to continue to service the rural community.

New technology

Micro-computers will have an increasing impact on agricultural extension. Although few farmers are as yet using micro-computers as an aid to record keeping and farm or financial planning, there is a growing interest in their application to agricultural production and marketing.

The range of farm business management computer programs being developed in Australia and overseas is increasing in number and quality, and their use by farmers and extension officers is expected to increase over the next decade. The Department can play a major role by evaluating the effectiveness of these computer programs as tools for on-farm decision making.

As equipment is established in district offices, video films will play an increasingly important role in extension programs. For example, a series of extension videos on irrigation and salinity management for the Riverland has recently been produced.

Agricultural systems research and extension

Agricultural systems research and development uses a multi-disciplinary approach to solving complex farming issues. Farming systems are an interaction of a wide range of physical, biological and economic factors. These can be assessed by using computer-based models. A well-constructed farming system model represents a summation of the current state of knowledge of the system and involves the integration of climatic and physical data, research knowledge, district experience and market behaviour. Agricultural systems research provides basic information for integrated extension programs that help farmers make complicated farm management decisions.

Projects under way include an analysis of South Australian dryland farming systems, land management alternatives for erosion control, evaluation of agricultural pollution of water resources, and strategies for irrigation management.

Farm management economics

The Department's aim in farm business management is to enhance management and decision making on farms. The Department's farm management economists provide training in cooperation with DTAFE in farm record keeping and financial management, and contribute information on markets, costs and alternative strategies on which decisions can be based. By monitoring selected farms, they can identify emerging problems and develop programs to provide farmers and departmental advisers with information and strategies.

Marketing

Marketing, in a general sense, includes all activities involved in the flow of goods and services from the producer to the consumer. In recent years, changes affecting the profitability of Australian agriculture have led to a greater emphasis on the marketing aspects of agricultural production.

The Department offers services in the following areas: assistance to industries in product specification (grading, classification, measurement, labelling and minimum standards for produce); the development, introduction, selection and evaluation of new products; market research for product development by the Department, and market development for new or smaller industries; and liaison with industries on the research, evaluation and development of marketing systems.

Establishment of the Horticultural Export Development Committee and appointment of horticultural marketing officers indicate the Department's concern to improve marketing performance in horticulture.

Major issues

- Demographic and social changes in the rural community;
- an emergence of rural hardship, especially in some industries and regions. Farmers are experiencing tight cash flow and high cost of credit, falling land prices and increased debts;
- an increased demand for information about new or alternative enterprises and products to maintain farm viability;
- farm financial management, especially the costs of machinery purchase, replacement and operating; the cost and availability of credit; farm budgeting, and investment decisions;
- the potential of new technology in communications and computing to enhance the information available to farmers for decision making;
- the need to develop further a systems approach to provide management information on complex issues such as tillage and rotation alternatives, enterprise mixes and changes, and natural resource management;
- inadequate information on market supply and demand, particularly quantity, grade and variety for some crops;
- opportunity for further improvement of marketing systems.

Corporate goals 1987-89

Short term

Enhance the Department's extension services to South Australian farmers by introducing improved extension management practices involving upgraded techniques in needs analysis and project management, evaluation and reporting.

Develop a systems approach to delivery of extension services to farmers which integrates the physical, technical, economic and marketing aspects of farm decision making.

In view of increasing economic pressures on the rural sector, help rural communities obtain assistance to employ rural counsellors in areas of the State where farm families are facing severe financial hardship.

Establish a rural women's desk in the Department of Agriculture to specifically address issues of concern to South Australian rural women.

Medium term

Improve communications with the farming community on the objectives, achievements and implications of the Department's research activities.

Improve technical and economic information and improved farm management decision making, by expanding computer facilities in district offices.

State disaster planning, control and relief

It is inevitable that disasters will occur in South Australia and the State Government recognises that these cause significant social, economic and environmental consequences to the State and its people. Accordingly it has enacted the State Disaster Act, 1980 (amended by the State Disaster Amendment Act, 1985) and Regulations, which provide a legislative basis for the preparation of counter-disaster and post-disaster plans. The Act and Regulations provide for arrangements that implement extraordinary powers and measures should it be necessary to declare a State Disaster under the Act.

State Disaster Organisation

Under the Regulations, the State Disaster Committee is empowered to group organisations into functional services, each headed by a State Controller appointed by the Committee. Collectively, these functional services are termed the State Disaster Organisation which is at the disposal of the State Coordinator for the conduct of operations outlined in the State Disaster Plan.

State Disaster Plan

The State Disaster Plan has been written to coordinate the extraordinary measures necessary when a disaster occurs and would normally not apply to reasonably commonly occurring emergency incidents that are within the capacity of the State's emergency services to deal with.

The Plan provides for the mobilisation of the State Disaster Organisation for the conduct of counter-disaster and post-disaster operations in the event of a declaration of a 'state of disaster', for example bushfire, flood or exotic disease outbreak. This could be initiated at either State or Police Divisional level, or both. However, the plan also provides flexibility for the State Disaster Organisation to react to emergency situations that have not been declared disasters at that stage, but that are considered to have the potential to escalate to disastrous levels.

The counter-disaster aspects of the plan have been prepared on the basis that responsibility for preparedness and response rests, in the first instance, at the local community level. The next level of support is at the Police Division level, and finally, support from the State's entire resources and possibly extraordinary resources from the Commonwealth. In this way, local community plans, Police divisional plans and the State Disaster Plan are integrated.

There are 13 functional services within the State Disaster Plan and the Department of Agriculture has the primary responsibility for the functional service titled 'Agriculture and Animal Services'. The following organisations are involved as participating organisations with the Department of Agriculture: Local Government authorities, Australian Veterinary Association, Stock Salesman's Association, Export and Local Abattoirs Operators, United Farmers and Stockowners of South Australia, Royal Society for the Prevention of Cruelty to Animals (South Australia), and the Bureau of Meteorology.

Agriculture and Animal Services

The Agriculture and Animal Services Function deals with two categories of disaster.

Exotic animal disease

The Department, as the primary combat authority, is charged with implementing procedures in conjunction with national authorities for the eradication or control of exotic animal diseases. This can involve:

- detection, diagnosis, risk assessment and surveillance of the disease;
- destruction and disposal of infected animals and products as required;
- disinfection of contaminated areas, buildings and vehicles;
- vaccination of stock and domestic animals;
- programs for vector control, such as insect and feral animal control;
- quarantine controls for the movement of people and animals.

Other disasters

The Department's role is to provide immediate animal relief services and continuing rehabilitation assistance to primary producers, including:

- assessment of injured stock and disposal of injured stock and carcasses;
- assessment of rural property losses and damage, including buildings, fences, crops and fodder;
- coordination of the supply and distribution of emergency fodder and other materials;
- administration of financial assistance to victims under the provisions of the Primary Producers Emergency Assistance Act.

Considerable progress has been made with implementing the Plan.

The State Controller has been appointed along with a number of deputy State controllers who assume the responsibilities of the State Controller in the latter's absence. The State Control Centre has been established as has the Exotic Disease Operations Centre.

The Counter-Disaster Plan for Agriculture and Animal Services has been written. In some regions, Disaster Plans for Police Divisions have been prepared with the help of departmental staff. The Disaster Plans have been integrated with the Department's Bushfire Relief Plan and Exotic Disease Plans.

Personnel have been allotted specific tasks. Exercises have been held to test the State Disaster Plan and, in some regions, the Divisional Disaster Plan. Key staff have attended courses at the Mount Macedon Counter-Disaster College in Victoria.

VHF and HF radio equipment has been ordered as the first stage of developing a statewide radio communications network. Training courses in radio communication have begun.

Major issues

- Training of disaster personnel in radio communication, message control, map plotting and counter-disaster management;
- potential to integrate the Department's radio communications system with the radio networks of Country Fire Services, the National Parks and Wildlife Service and the State Emergency Service;
- maintenance of a continuously updated Agriculture and Animal Services Counter-Disaster Plan as personnel and circumstances change;
- development of an effective coordinating committee for the Agriculture and Animal Services Functional Service.

Corporate goals 1987-89

Short term

Train disaster personnel in radio communication, message control, map plotting and counter-disaster management.

Medium term

Integrate the Department's radio communications system with the existing radio networks of Country Fire Services, National Parks and Wildlife Service, and State Emergency Service.

Integrate the Department's radio communication system for counter-disaster work with the day-by-day operations of regional staff.

Support services

Support services are an integral component of the Department. In addition to administrative and clerical support, which ensures smooth and efficient operation of the Department's activities, specialist scientific and technical support is provided to managers, research workers and extension officers.

Management and administrative support

This includes management and administration of resources, clerical support to assist officers in research, extension, diagnostic and regulatory work, and staff development and training activities.

Administrative, clerical and keyboard services

Staff are located throughout the Department to provide administrative support, typing, word processing and receptionist facilities.

Word-processing capacity has been increased to service the large demand for preparation of technical papers, reports and other work, and typewriters have been enhanced with memory and printing functions. Telex and facsimile facilities are provided in Head Office to enable worldwide communication of messages and other information.

A Correspondence Services Section is responsible for distributing all correspondence and maintaining a central filing system. Investigations are being conducted into the feasibility of computerising the file indexing and referencing system to provide faster and easier access to files.

A Supply Section provides facilities for the procurement of goods and services, calling of tenders and control of the departmental inventory of plant and equipment. This inventory is in the process of being computerised.

Services are also provided at Head Office and regional centres to manage and maintain departmental land, buildings, motor vehicles and farm machinery and equipment.

Finance and accounting

These services are provided by the Accounting Section. The principal functions are financial management and general accounting.

Financial management services include negotiating with Treasury on departmental funding implications, preparing budgets, providing a variance analysis service, and conducting financial investigations.

General accounting services include maintaining departmental ledgers, paying trade accounts and general expenses, billing sundry debtors, and collecting and recovering revenue.

The Section must comply with the requirements of Treasury, the Auditor-General and other central agencies when performing these functions.

Recognising the increasing demand for public accountability, the Section is implementing a new general ledger system to provide all levels of management with relevant, accurate and timely information. In this way, the Section will coordinate the provision of financial information consistent with the Department's corporate objectives and the proposed integrated management information system. The Department will be linking its financial ledger to the Treasury accounting system in late 1986.

Scientific and technical support

Research and extension staff are given support in mathematics, statistics, experimental design, computing, information provision and processing, artwork, journalism, and social survey design.

Mathematics and computing

Specialists are located at Head Office to provide mathematical and computing services. Expert assistance is provided in experimental design and statistical analysis of experiments and surveys in research and extension. Assistance and advice is given on the purchase and evaluation of computing technology for the Department and planning and development of computerised information systems.

Library services

A network of libraries and book collections in departmental offices and research centres throughout the State is provided for the Department and the public. The main library provides a range of library services at Head Office and catalogues and

maintains the book collections in the Department's country offices and research centres.

The library collection includes 14 000 books and reports, 1 500 periodicals, and a range of films, slide tapes and video tapes. The Department has access to other library collections and provides automatic literature searching of national and international data bases.

Publications and media

Specialists at Head Office assist in the production, distribution and promotion of departmental publications. This includes audio-visual, photographic and display materials and written publications. They also help district staff prepare news releases.

Extension training

A training officer works with departmental extension specialists to design and deliver a series of extension training programs. These are to ensure that new and experienced officers continue to develop the range of skills required for effective extension services to South Australian farmers.

Personnel management and staff development

The Department assigns a high priority to the development and maintenance of a well-trained and competent workforce. This is relevant to managers, the technical/professional areas and the administrative/clerical staff. Staff take formal courses and attend short courses with the support of the Department. A range of courses is organised and run by departmental staff, including a comprehensive management training program. The Department has also introduced a program of personal development reviews. These reviews have a twofold purpose: to help staff in planning their career development, and to determine staff training needs throughout the Department.

Other services include assisting managers in conducting reviews of their units, recording any changes in the departmental staffing structure, and assisting in recruitment, promotion and classification of employees.

The Department wishes to achieve a greater degree of delegation of and autonomy in personnel management matters and is pursuing ways of increasing the accountability of line managers while reducing the level of their dependence on centralised specialist support groups. This is facilitated by the introduction in 1986 of the Government Management and Employment Act which provides chief executive officers of departments with greater administrative flexibility and freedom for delegation than was possible under previous legislation.

Equal employment opportunity

As an organisation committed to sound management practices and the provision of high-quality services to the public, the Department has been one of the forerunners to encompass the spirit and intent of the South Australian equal opportunity legislation.

The Department has established a policy that is consistent with the legislative requirement to provide employment opportunities equally, irrespective of factors irrelevant to the job (such as race, ethnic background, physical impairment, marital status, pregnancy, sexuality and sex). This policy ensures that the best people are employed to provide the best possible service.

Occupational safety and health

The Department recognises the need for further improvement in its employee safety and health record and therefore has a strong commitment to the South Australian Code of General Principles in Occupational Safety and Health. It has introduced a joint management and staff safety and health policy and a structure for administration of the Code. More than 40 occupational safety and health worksite committees have been established throughout the State. These are involved in the development of counter-measures to prevent damage and injury incidents.

A number of major projects have been implemented. These include: prevention of clerical strain, pre-placement health assessment, back-strain injury, chemical safety, a data collection system, first aid services, and an employee fitness and health program.

A safety and health coordinator supports worksite committees and helps in the planning and implementation of major projects.

Major issues

The planning of support services depends mainly on the type and level of activities in other departmental programs. Specific issues are as follows.

- Adaptation of the Departments' management processes, including delegation of functions, to the requirements of the Government Management and Employment Act, 1985.
- Government objectives to contain public expenditure while maintaining an effective service to clients, and the associated need to maintain a high standard of departmental management.
- In the light of continuing staffing constraints, the need to maintain a high level of staff motivation and achievement.
- The continuing demand for more accountability by Government departments.
- Corporate information requirements and the need to identify strategies for the further development of management and technical information systems.
- There is opportunity to address the extent of work-related injuries and rising workers' compensation costs.
- The need for staff development, training and re-training to meet changing needs.

Corporate goals 1987-89

Short term

Emphasise the importance of occupational health and safety by giving priority to the development and promotion of health and safety programs in accordance with Government policy and in association with staff.

Enhance the effectiveness and control of human resource deployment in the Department through developing improved financial and workforce reporting systems.

Conduct a feasibility study to help ascertain the Department's requirements for management information and develop improved systems and applications to meet the planning, reporting, evaluating and technical needs of management and staff.

Develop and promote equal employment opportunity policies and practices in consultation with staff.

Medium term

Develop a computing plan to determine future requirements for applications development, computer hardware and software, and data communication networks.

Principal South Australian Government Acts administered by the Minister of Agriculture

Abattoirs Act, 1911
Agricultural Chemicals Act, 1955
Apiaries Act, 1931
Barley Marketing Act, 1947
Beef Industry Assistance Act, 1975
Biological Control Act, 1985
Branding of Pigs Act, 1964
Brands Act, 1933
Bulk Handling of Grain Act, 1955
Canned Fruits Marketing Act, 1980
Cattle Compensation Act, 1939
Citrus Industry Organisation Act, 1965
Dairy Industry Act, 1928
Dried Fruits Act, 1934
Egg Industry Stabilisation Act, 1973
Foot & Mouth Disease Eradication Fund Act, 1958
Fruit Fly Act, 1947
Fruit & Plant Protection Act, 1968
Fruit & Vegetables (Grading) Act, 1934
Hide Skin & Wool Dealers Act, 1915
Marginal Dairy Farms (Agreement) Act, 1971
Marketing of Eggs Act, 1941
Meat Hygiene Act, 1980
Metropolitan Milk Supply Act, 1946
Noxious Insects Act, 1934
Pest Plants Act, 1975
Phylloxera Act, 1936
Primary Producers Emergency Assistance Act, 1967
Potato Marketing Act, 1948
Poultry Meat Industry Act, 1969
Rural Industry Adjustment and Development Act, 1985
Rural Industry Assistance Act, 1985
Rural Industry Assistance (Ratification of Agreement) Act, 1985
Seeds Act, 1979
South Australian Meat Corporation Act, 1936
Soil Conservation Act, 1939
Stock Diseases Act, 1934
Stock Foods Act, 1941
Stock Medicines Act, 1939
Swine Compensation Act, 1936
Trespassing on Land Act, 1951
Vertebrate Pest Act, 1975
Veterinary Surgeons Act, 1935
Wheat Marketing Act, 1980