

LIVESTOCK FROM SOUTH AUSTRALIA

-sheep, dairy and beef breeds



Other books by
Department of Agriculture and
Fisheries, South Australia

Farming Systems in South Australia
Pasture Seeds from South Australia

Published, designed and produced by
the Department of Agriculture and
Fisheries, South Australia, 1979.

Aldine Roman typesetting by the
Department of Agriculture and
Fisheries.

Reproduction, plates and printing by
D.J. Woolman, Government Printer,
South Australia.

National Library of Australia
Cataloguing in Publication data.

Jeffries, Brian C.
Livestock from South Australia,
sheep, dairy and beef breeds.

ISBN 0 7243 5323 2

1. Livestock breeds — South
Australia. 2. Dry farming —
South Australia.

I. Liebelt, Murray A., joint
author. II. Williams, Richard D.,
joint author. III. South
Australia. Dept. of Agriculture
and Fisheries. IV. Title.

636.0821'0994'23

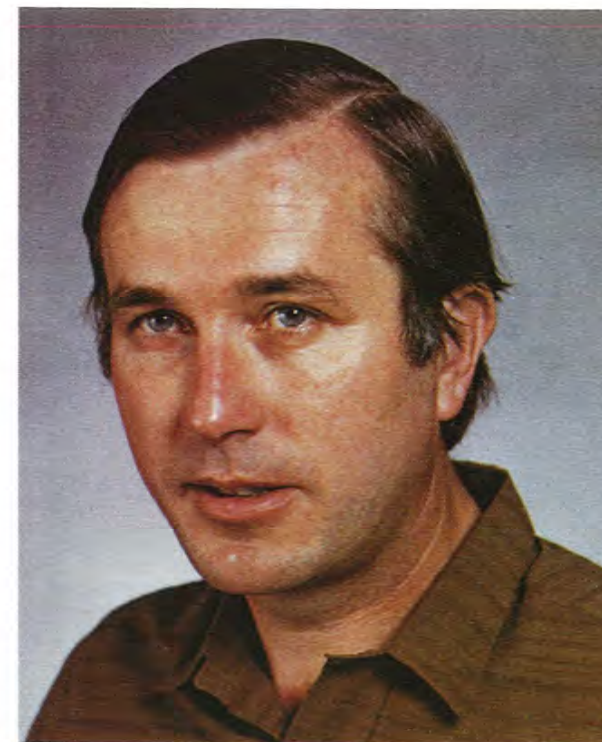
Foreword

This is the third in a series of
books explaining what South
Australian agriculture has to offer
overseas countries.

The first was "Farming Systems
in South Australia" and the
second "Pasture Seeds from
South Australia". All three books
provide information about
agriculture that is unique by
international standards because it
has been developed to suit an
inherently infertile land in a
fairly harsh environment.

Although South Australian live-
stock and pastures have their
origins in other countries, they
have been selected, both
deliberately and naturally, to suit
the State's conditions. With live-
stock, South Australia has
developed hardy strains that grow
well under low nutrition.

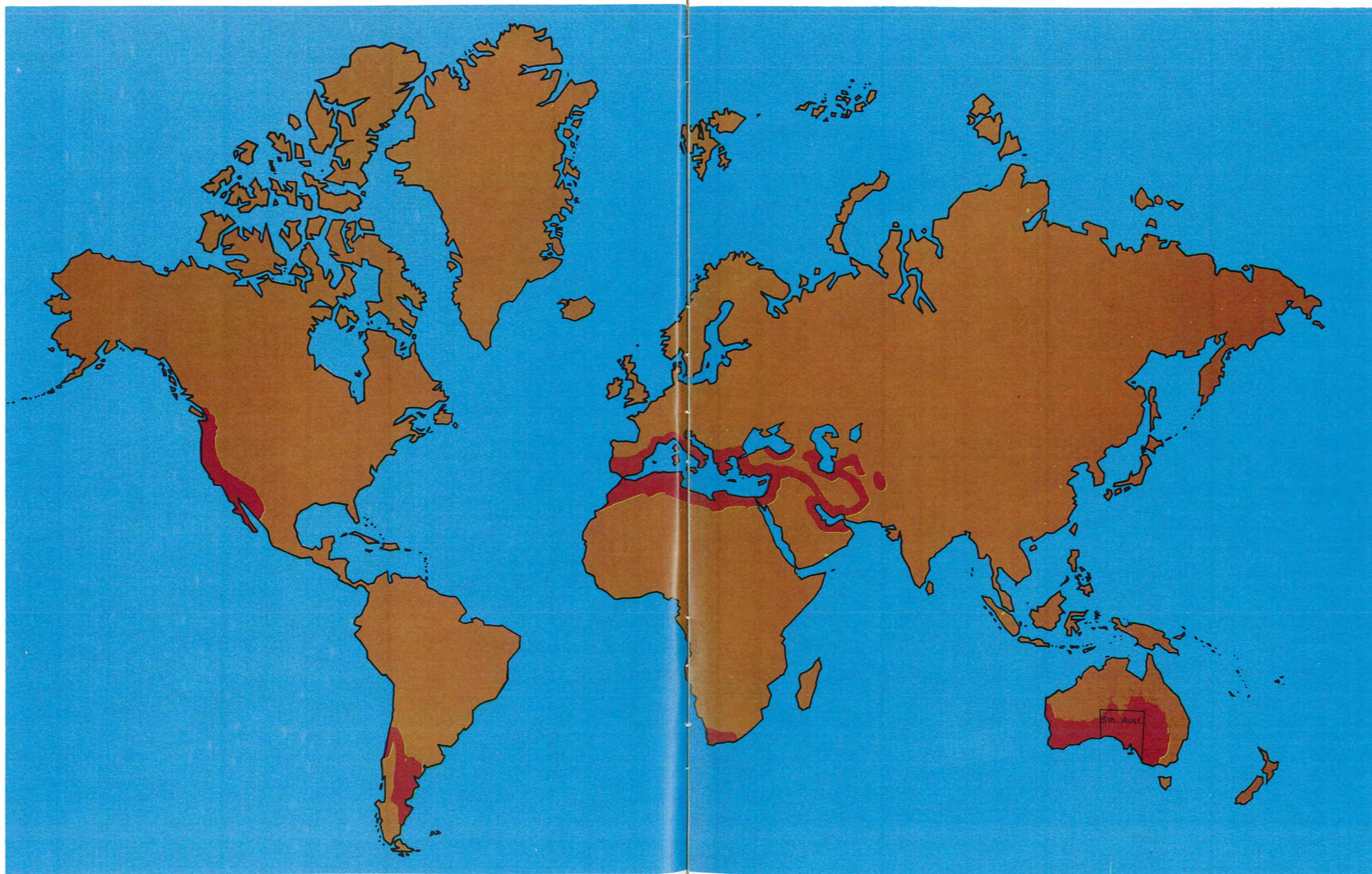
This book tells of the breeds and
strains of livestock that are avail-
able for export. It is a further
step by the South Australian
Government to make all aspects
of the State's experience avail-
able to countries interested in
adopting a similar agricultural
system. Even countries without
an environment suited to the
South Australian farming system
may be interested in South
Australian breeding stock as a
source of new genetic material.



Brian Clatten

Minister of Agriculture
South Australia

Figure 1: The Mediterranean basin and western Asia, the southern part of South Africa, and parts of North and South America have a climate similar to southern Australia. The State of South Australia is outlined.



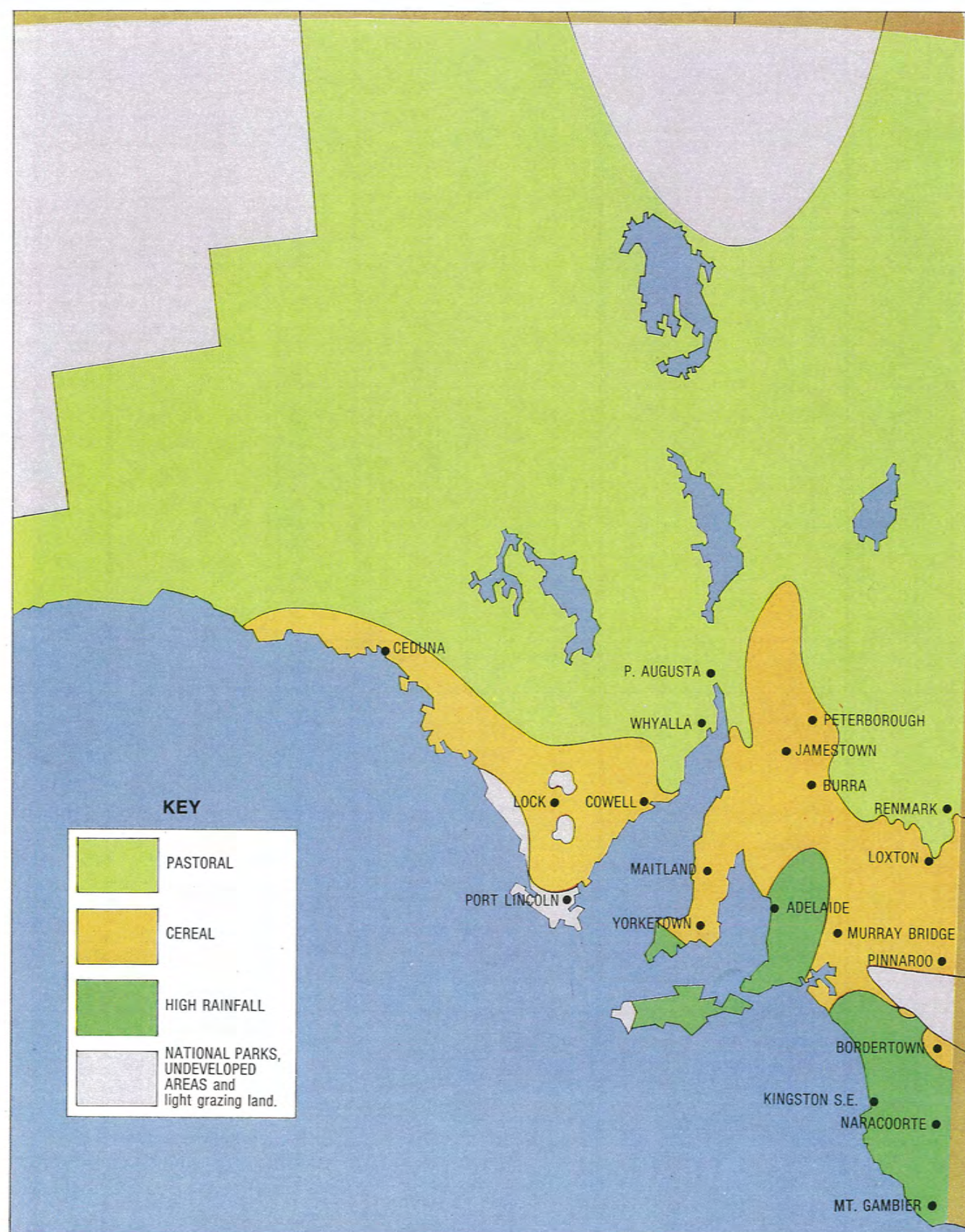


Figure 2: The three zones of agriculture in South Australia. Sheep and cattle are grazed at low intensity in the pastoral zone, grain and livestock are grown in rotation in the cereal zone, and beef, dairy, lamb and wool are the most important of a wide range of enterprises in the high rainfall zone.

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The purpose of this book

This book promotes the sale of quality stud and commercial breeding stock from the sheep, beef and dairy industries of South Australia. It has been prepared by specialist livestock officers of the South Australian Department of Agriculture and Fisheries working in conjunction with a departmental marketing group called EXSAB.

EXSAB is responsible for the promotion and development of breeding stock export sales from South Australia. It co-ordinates overseas orders and ensures that purchased stock comply with the buyer's requested standards of production and health. EXSAB assists with individual sales and negotiates long-term contracts with overseas governments or importers for the delivery of breeding stock at a predetermined price and standard. All South Australian breed societies are willing to help with the selection of stud livestock for export.

Where a buyer wishes to purchase semen or fertilized ova from South Australia, EXSAB is prepared to certify the product only when it is obtained from approved stock that have been bred with the aid of measurement and for which production records are available. Pure stud animals have to be passed by breed society inspectors.

While no guarantee can be given as to how South Australian livestock will perform under different climatic and nutritional conditions, breeding stock have already been sold from South Australia to over 50 countries in all parts of the world.

The preface of this book contains an outline of the environmental conditions under which stock are bred and run. For a more detailed description of South Australian management systems and environmental conditions, see the book "Farming Systems in South Australia".

Production figures in "Livestock from South Australia" are the average figures obtained under South Australian open range management conditions. Intensive rearing would boost production above these levels.

Some of the animals illustrated in this book as examples of the respective breeds are in show condition. The recorded performance data are for animals within the range of bodyweights quoted. For animals to reach these bodyweights they must be free of diseases that are likely to inhibit growth and production.

For each breed described in this book an indication is given of the availability of stud and commercial animals for immediate delivery. If long-term contracts are negotiated, however, breeding programmes can be adjusted to increase the numbers for sale. Contracts can be filled by animals from other Australian States if the number required is not available from South Australia.

Enquiries about the availability of livestock can be made through:

The Executive Officer,
EXSAB,
South Australian Department of
Agriculture and Fisheries,
Box 1671, G.P.O.,
ADELAIDE,
SOUTH AUSTRALIA 5001

or through the stock agents and breed society secretaries listed in this book.

Preface

South Australia has a semi-arid Mediterranean-type climate. It is a climate similar to that of large areas of semi-arid and arid land in many developing countries, particularly the Middle East and North Africa.

South Australian farmers have harnessed limited natural resources with stable and productive farming systems for each of the State's three farming zones. The zones are drawn up according to rainfall.

Breeds and strains of livestock have been developed to suit each of the zones.

The pastoral zone is South Australia's dry inland area. Average annual rainfall is between 200 and 250 mm a year, extremely erratic in distribution and may vary from 100 to 1 000 mm in a year. The pastoral zone accounts for 83 per cent of the State.

The farming system in the pastoral zone is one of low intensity grazing based on a delicate balance of utilization and conservation of the native vegetation of the steppe, which includes many perennial herbs and grasses that can be permanently damaged by over-grazing. The main production enterprise is sheep grazing, supplemented with some cattle raising.

The cereal zone is the intermediate rainfall area. Although it covers only 11 per cent of the State, it is most important agriculturally. Seasonal incidence of rain is Mediterranean in type, the most effective falls occurring between April and October, with a wide variation within the zone. Annual falls vary from 250 to 500 mm with wide fluctuations. Recurring droughts are a feature.

Production is based on rotating cereal crops with annual legumes and integrating cereal and livestock production. This system utilizes the nitrogen-fixing properties of legume pastures to increase soil nitrogen for cereal crops while the legumes feed large numbers of livestock. Specially adapted shallow tillage methods and special livestock management and soil conservation practices have been built into the system.

Sheep and cattle in the cereal zone are managed in a series of fenced paddocks and grazed on sub-clover or medic-based pastures which comprise the pasture phase of the crop rotation. The livestock also utilize cereal stubbles after harvesting. In this farming system little conserved fodder is fed to livestock except in late autumn-early winter when pasture, hay or oats may be fed to lambing ewes or breeding cattle. In drought years stock may have to survive for some months on a pasture hay or cereal grain maintenance ration. Livestock raised in the cereal zone must be able to adapt to a system in which dry paddock feed or cereal stubbles may be the only feed available for up to six months of the year. Stock bodyweight and condition help owners to determine when supplementary feeding is necessary or whether stock must be sold. Good managers try to anticipate crises and sell while stock are fat and markets good.

The high rainfall zone is in the southern portion of the State and covers about six per cent of South Australia. Compared with the cereal zone, it has a more reliable growing season. Annual rainfall is 500 to 800 mm with a Mediterranean incidence from April to November. There is less risk of drought.

Farming in the high rainfall zone is based on high intensity grazing and some high-value crop production. The graziers here have developed a higher stocking system through the use of annual and perennial legume pastures. Once again, the feeding of conserved fodder is normally confined to late autumn-early winter. Lot feeding is not usual because the margin between purchase and sale price of stock is too small to warrant it.

The three zones are interdependent and integrated, which benefits the stability of each system. The pastoral zone is mainly a stock-breeding area. Some store stock are transported to the better rainfall areas for fattening and cast-for-age ewes are sold to lighter soil cereal areas for joining with British breed rams to produce prime lambs. There is also a similar interchange of livestock and feed supplies between the cereal and high rainfall zones to cope with seasonal fluctuations, which are typical of the South Australian environment.

Health status of South Australian livestock

Ruminant animals in South Australia should meet the health status requirements of the most discriminating buyers.

Many of the major diseases of sheep and cattle are not present in South Australia. The State's herds are free of foot and mouth disease, rinderpest and, because of the absence of tick vectors, babesiosis and anaplasmosis. The majority of the State has been declared provisionally free of tuberculosis and an active programme is underway to eradicate bovine brucellosis. Johne's disease is a rare occurrence in South Australian herds, as are liver fluke and trichomoniasis.

Government veterinary officers are so deployed that they have effective knowledge of the health status of herds and flocks in their districts. They can facilitate any testing that may be required by importing countries.

Health certification and any associated testing may take some time to complete. Buyers of South Australian animals for export can help considerably in the preparation of their animals for shipment by ensuring that the animal health requirements of the purchasing country are discussed with the Chief Veterinary Officer of the Department of Agriculture and Fisheries, Adelaide, at the earliest possible date. Potential problems can then be anticipated and staff and facilities prepared to efficiently carry out any necessary tests.

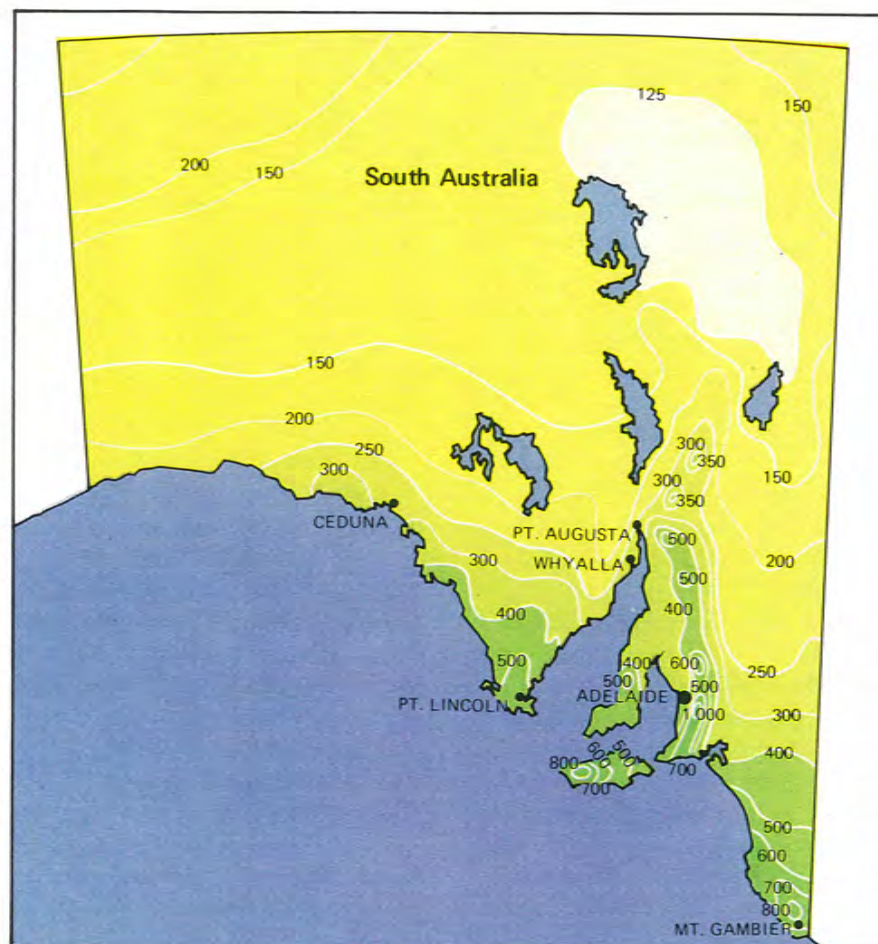
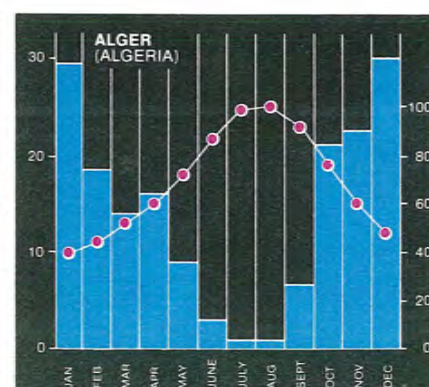
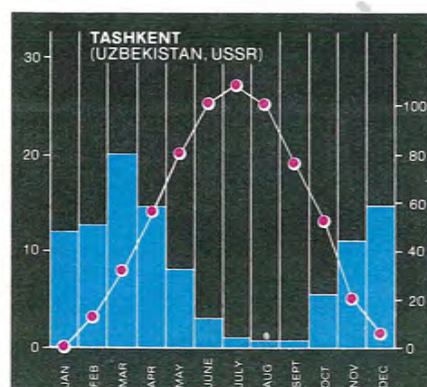
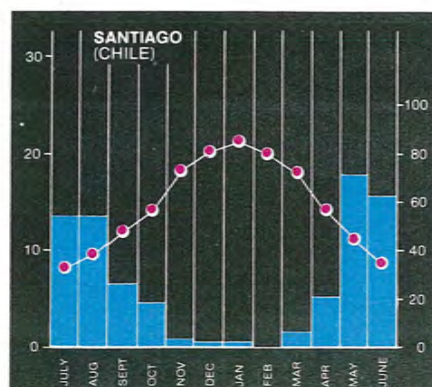
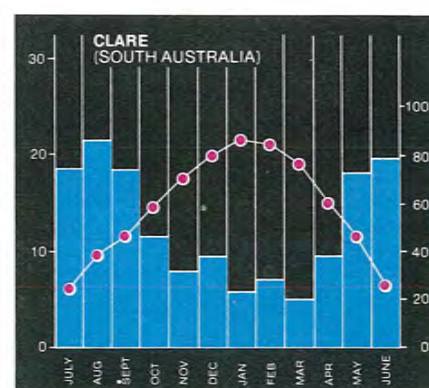
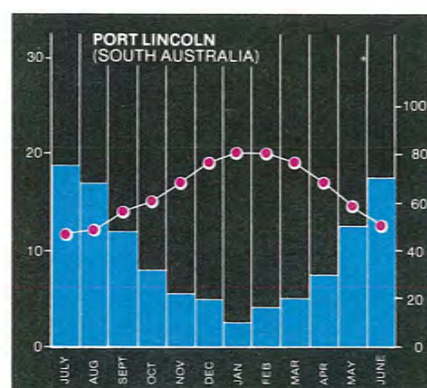
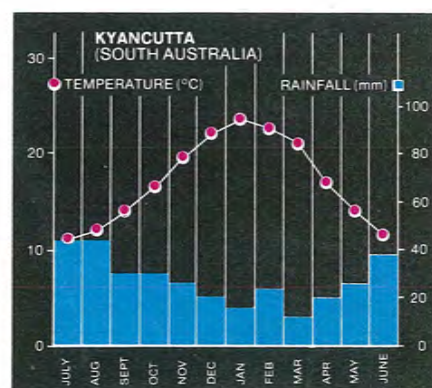


Figure 3: The average annual rainfall (mm) in South Australia.

Figure 4: Rainfall and temperature at three sites in South Australia and at similar sites in South America, North Africa and the Middle East. Because of the difference in season Southern Hemisphere charts begin in July, and Northern Hemisphere charts in January.



SHEEP



Sheep

The South Australian sheep population increased dramatically in the 1950s. High prices for wool and meat enabled producers to develop large areas of improved pasture, particularly in the high rainfall zone. At the same time, the ley farming system was developed in the cereal zone. Ley farming combats soil erosion and low soil fertility resulting from over-cropping and exploitive crop-fallow rotations.

The sheep population in South Australia in 1944 was 10.3 million but fell to 6.7 million in 1946 at the end of a three year drought accentuated by a high rabbit population and little improved pasture. The sheep population increased from 9.5 million in 1950 to 19.7 million in 1970 but fell to 15.7 million in 1973 following two years of low wool prices and a dry season in 1972. Sheep numbers rose to 17.3 million in 1976 but a drought in the cereal zone, which lasted almost three years, caused a decline to 14.1 million as at 31 March 1978.

The sheep population in South Australia, the driest State in the driest continent, depends on rainfall. In the pastoral zone, where rainfall is very erratic, about two million sheep are carried within the boundaries of the dingo (wild dog) proof fences. Cattle only are run outside the fences.

Rainfall is variable in the cereal zone but follows a Mediterranean pattern of winter incidence. The growing season varies between four and seven months, depending on rainfall, altitude and soil type.

The high rainfall zone comprises only six per cent of the State but carries seven to eight million sheep and over one million cattle. The pattern of rainfall is definitely Mediterranean but the growing

season extends over six to nine months, depending on soil type and rainfall.

There is a movement of sheep from the pastoral zone to the cereal zone and in dry seasons from the pastoral and cereal zones to the high rainfall zone.

Distribution of breeds

South Australia's major sheep breed is the Merino which comprises 86.5 per cent of the sheep population. The major strain is the South Australian Strongwool Merino which was developed in South Australia for the dry pastoral zone. It can thrive on sparse feed and walk long distances to water.

All two million sheep in the pastoral zone are Merinos — large, plain-bodied sheep that usually cut six to seven kilograms of wool per head for ewes and seven to eight kilograms of wool for wethers. Stocking rates are very low at one sheep to each five to twenty hectares.

Over 90 per cent of sheep in the cereal zone are Merinos. Many British breed studs are located in the zone, however, and Border Leicester rams are joined mainly with cast-for-age Merino ewes to produce crossbred ewes for the high rainfall zone.

Some surplus or cull Merino ewes are joined directly with Dorset or Suffolk rams for prime lamb production in the early, lighter soil districts where the longer breeding season of the Merino is an advantage. These ewes can be joined in November or December to lamb in April-May at the expected break of the season. The ewes and their lambs benefit from the green feed provided by the opening rains and can then be marketed early in September at premium prices. The Merino ewes thrive well in the dry, sandy areas.

About 70 per cent of sheep in the high rainfall zone are Merinos. There are also Corriedales, Polwarths, Comebacks and crossbred ewes. The Comeback is a

Sheep numbers in South Australia by breed. (These 1974 figures indicate the importance of various breeds in the State).

| | | Number | % |
|----------------|-----------------------------|------------|------|
| Wool | Merino | 14 212 000 | 86.5 |
| | Corriedale | 646 200 | 3.9 |
| | Polwarth | 137 300 | 0.8 |
| Eng. longwools | Border Leicester | 28 000 | 0.15 |
| | Romney Marsh | 18 000 | 0.09 |
| Shortwools | Dorset Horn and Poll Dorset | 78 000 | 0.41 |
| | Suffolk | 18 000 | 0.09 |
| | Ryeland | 6 000 | 0.02 |
| | Other unspecified breeds | 5 525 | 0.02 |
| | Merino Comeback | 133 600 | 0.8 |
| | Crossbred | 1 149 300 | 7.0 |
| | | 16 431 900 | |

Source: Australian Bureau of Statistics.

Here are examples of four methods of producing prime lambs for meat:

| Rams | | Ewes | |
|---|--|------|---|
| 1. | South Australian Merino | X | South Australian Merino |
| | Castrated male lambs (for market) OR kept as wethers for wool and sold for mutton or the live sheep export to the Arabian Gulf. | | Ewe lambs (for breeding) |
| 2. | Polled Dorset, Dorset Horn, OR Suffolk etc. | X | South Australian Merino, Corriedale, OR Polwarth |
| | | | All lambs for market (except some Dorset X Merino ewe lambs which may be kept as prime lamb mothers because they can be joined earlier than other crosses). |
| 3. | Border Leicester OR Romney Marsh | X | South Australian Merino |
| | Castrated male lambs for market | | Ewe lambs for market OR kept as prime lamb mothers |
| 4. | Polled Dorset, Dorset Horn, OR Suffolk etc. | X | Border Leicester X Merino (60 to 70 per cent of prime lamb mothers in South Australia), OR Romney Marsh X Merino (in wetter areas) |
| | | | All lambs for market |
| British breed sheep are usually run as stud flocks to produce rams for prime lamb production as first or second cross lambs. | | | |

type of sheep not established as a breed but coming back to the Merino by crossing the Merino with Corriedales and Polwarths to produce a denser fleece and sheep that will thrive better than the purebred Merino in the high rainfall zone. Young Merino sheep particularly do not thrive well in cold, wet environments.

Most of the Corriedale and Polwarth studs are in the high rainfall zone, where there are also some British breed studs.

South Australia has about 360 Merino stud flocks. The major studs are in the valleys of

the mid-north agricultural district which receive 400 to 450 mm annual rainfall and where dryland lucerne grows well. It is ideal country for growing out young sheep. Many of the bigger studs have a property on the edge of the pastoral zone where ewes grow well and the climate is warm, providing an ideal environment for rearing young lambs. Young male sheep are often moved to lucerne grazing areas after weaning.

Only 27 of the studs have more than 1 000 ewes. There are seven parent studs each with 5 000 to 10 000 ewes. One parent stud in

South Australia, "Collinsville", has the largest family group of studs in Australia.

Breeding

The major breeding method used in South Australia is the pyramid or hierarchy of studs with rams passing from large parent studs to smaller daughter studs to other studs or commercial flocks who may buy rams at any level. The studs use a family system of breeding. A few use the simpler nucleus breeding system.

The South Australian Department of Agriculture and Fisheries pro-

notes the use of measurement of wool production in wool-growing studs and flocks and adjusted growth rate in meat-producing studs.

Some studs are actively using measurement as an aid in selecting more productive animals.

Other commercial or stud breeders who cannot buy sheep on measurement are forming group breeding schemes to capitalize on the larger joint population of animals and consequently the larger gene pool to facilitate more rapid genetic progress.

Grading up

It is usually economical in a country with low-producing sheep to grade up to an improved breed type rather than import large numbers of the new breed type. The procedure offers two advantages:

- it is more economical to bring in rams only or a small stud flock from which rams can be disseminated.
- it is usually advantageous to use local breed ewes because they have adapted to the environment which often may be quite harsh compared with the environment from which the improved breed comes.

In the grading up process characters of hardiness and thrift in the local environment should be given priority because continued production and selection for improvement will depend on the percentage of lambs reared in the flocks. It would be important then to introduce into the local breeds characters likely to increase production and returns per head and per hectare in terms of more and better wool, meat (as lamb or mutton) or skins.

Alternatively, it may be more practicable to select for higher production within the locally adapted breeds if numbers permit.

Commercial production

For small flocks in other countries it will be important to have access to replacement rams of satisfactory standard and production, preferably selected with the aid of measurement. About a quarter of the rams and a fifth of the ewes should be replaced annually.

In larger flocks it is usually easier to set up a ram breeding nucleus than to buy replacement rams, unless a stud or nucleus flock based on selection with the aid of measurement is available on a government or private farm. This is also likely to be the case for a group breeding scheme in which breeders co-operate to pool their genetic material to improve selection or market potential.

Adaptability

For best survival and production it is better to select animals within the environment in which they are to be run. Many local breeds have been developed or evolved by natural selection within a relatively harsh environment.

It is most important to consider standards of production and measurements of production characters in relation to the environment and available nutrition. All measurements of breeds quoted in this book are recorded at the bodyweights stated, which can be used as a guide to the nutrition level and freedom from parasites of the animals when the measurements were made.

Sheep breeds

In South Australia, sheep breeds can be divided broadly into two groups — dual purpose breeds and Down-type or shortwool breeds.

Dual purpose breeds

Dual purpose breeds are kept for both wool and meat production.

Merino

The South Australian Strongwool Merino is the backbone of the State's sheep industry, making up about 85 per cent of the sheep population. Although primarily kept for wool, they are good mutton sheep.

They were originally bred for the semi-arid pastoral zone but there are now large numbers in the cereal and high rainfall zones.

In the cereal zone Merino ewes are directly joined with Dorset or Suffolk rams to produce prime lambs of 15 to 20 kg carcass weights at four months of age straight off their mothers. In the high rainfall zone there is a greater tendency to use first cross ewes as prime lamb mothers because they produce more and heavier lambs and are easier to manage under high rainfall conditions.

Merino wethers of 50 to 55 kg liveweights are eagerly sought from South Australia by the Middle East live sheep trade.

Merino export embargo

There has been a partial lifting of the embargo to allow up to 300 rams to be exported each year.



South Australian experts, through correspondence or on-the-spot consultancy, can advise on breeding plans.

Polwarth, Corriedale, Cormo and "Come-back" type sheep

Crosses between rams of the breeds listed here with Merino ewes have been developed in the high rainfall zone to produce sheep that have a higher lambing percentage and thrive as young animals in cold, wet environments.

Lean heavyweight wethers of Corriedale, Polwarth, Cormo and "comeback" type sheep can be shipped live to overseas markets. Large numbers of breeding stock are available.

Castrated male lambs can be marketed in fat condition at four to five months of age at 28 to 35 kg liveweight or as lean lambs to the Middle East at 20 to 30 kg liveweight (9 to 14 kg carcasses).

Longwool breeds

Examples of longwool breeds are Border Leicester and Romney Marsh. They were developed to produce rapid growth rate/meat-type lambs and yet have a profitable fleece. Their main use in Australia, particularly the Border Leicester, is in crossing with Merino ewes to produce first cross prime lamb mothers. Hybrid

vigour in the first cross ewes leads to an increase of up to 20 per cent more lambs born than either of the pure breeds. Management of the offspring has been easy with few losses.

Many first cross Border Leicester X Merino cross ewes have been exported as prime lamb mothers. A large draft of these ewes was exported to Mexico some years ago.

Down-type or shortwool breeds

Examples of Down-type or shortwool breeds are Poll Dorset, Dorset Horn and Suffolk. They

are run in stud flocks to produce rams as sires for prime lamb production using purebred dual purpose breed ewes or first cross English longwool X Merino ewes.

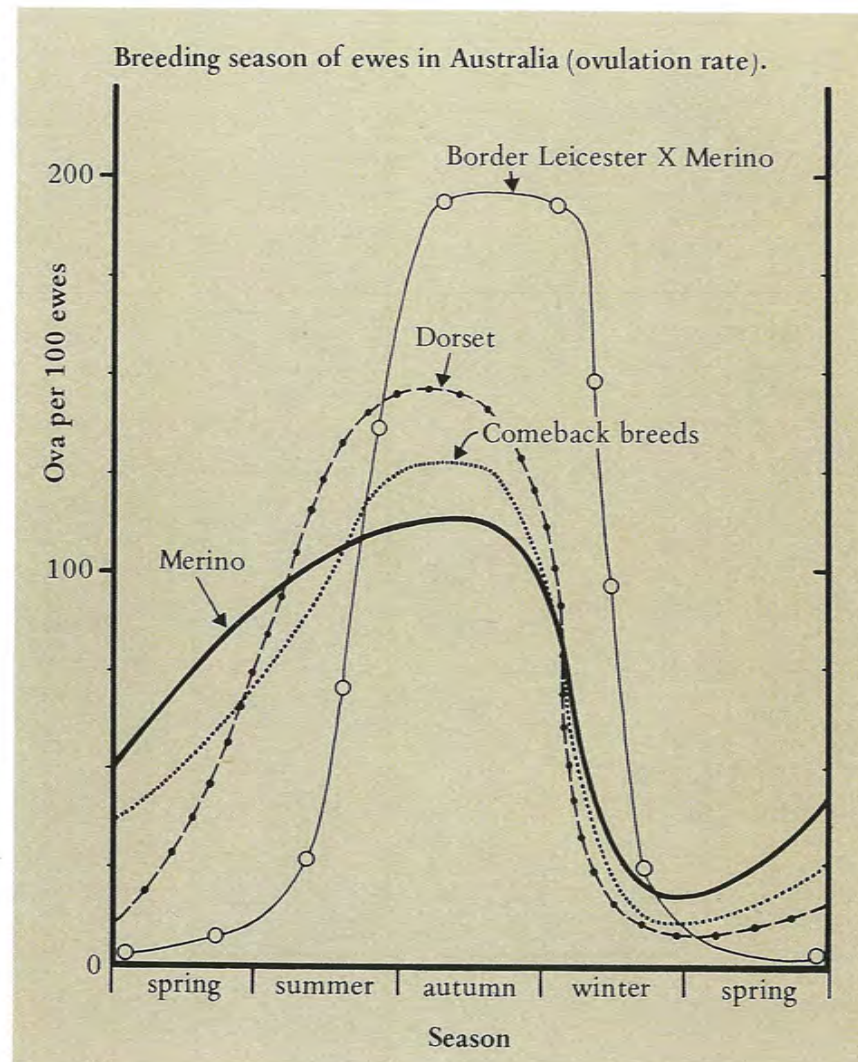
In South Australia, prime lambs are sold in the local market at four to five months of age weighing 30 to 40 kg live (15 to 18 kg carcass weight). First and second cross lambs grow fastest and predominate in the trade.

Demand is growing from the Middle East for quickly grown lean lamb carcasses. Such lambs weigh 20 to 30 kg live (9 to 14 kg carcass weight). Merino or other dual purpose bred lambs are ideal for this trade.

Breeding season

To determine the optimum time of joining, it is necessary in an integrated programme to consider the fertility of ewes through the season, the pasture growth cycle and market prices. Some British and European breeds have a short breeding season and mate only in the autumn and early winter. Others, like the Dorset Horn, Poll Dorset and Merino have a longer breeding season and can be mated from early summer onward. Comebacks and crossbreeds are midway between these extremes and can be mated from late summer onward to late winter.

Generally, the reproduction rate of ewes is at a minimum during late winter in South Australia. (With British breeds, the rate is zero during the anoestrus period in September-October.) The rate increases to reach a maximum for ewes in March-April. A compromise has to be reached between the optimum lambing percentage, optimum growth rate on green pastures and optimum price per head.



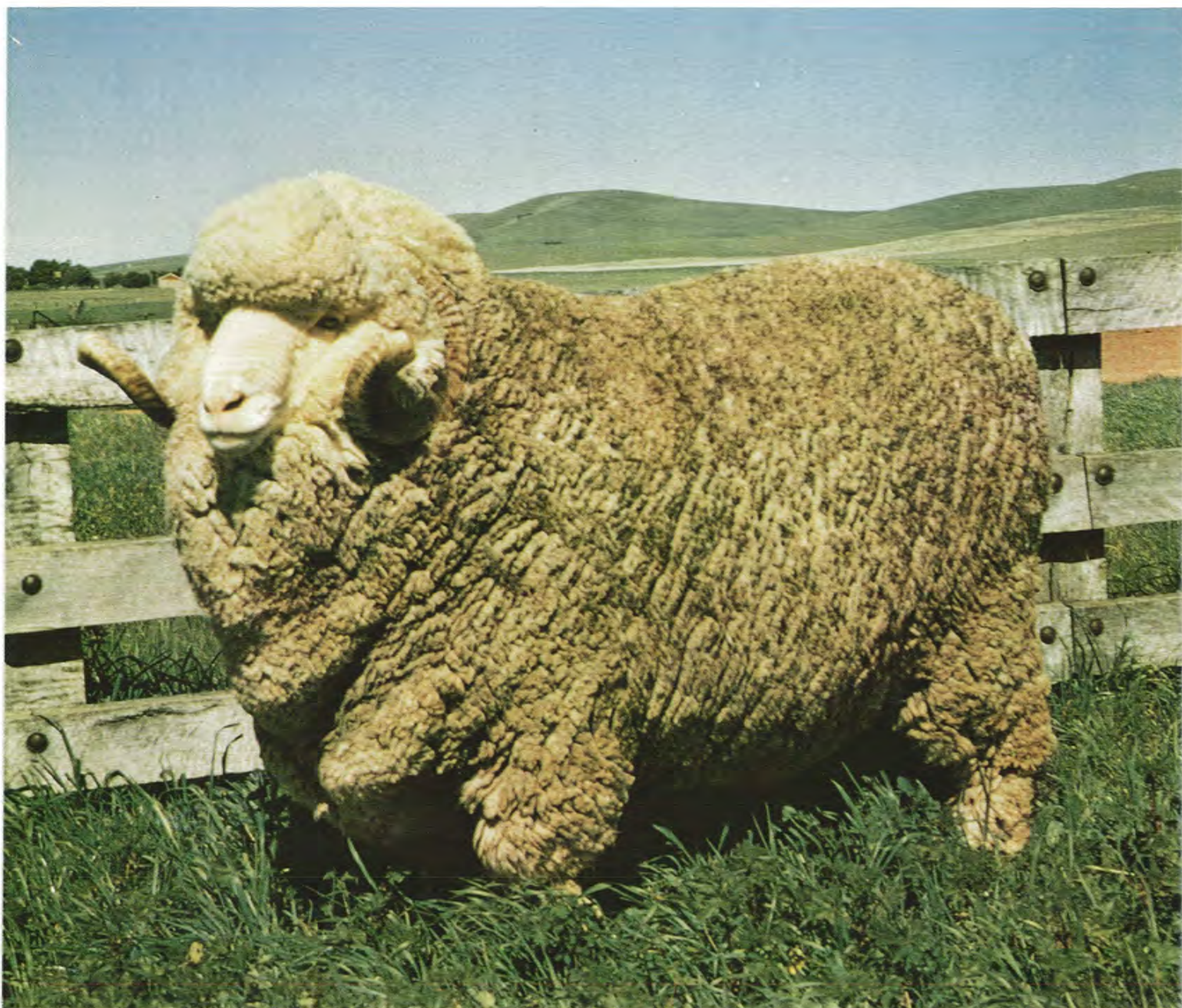
Graphs of relative reproduction rates (as indicated by ovulation rate) for various breeds and crosses through the season.

OPPOSITE:

(Above) In South Australia's hot, dry pastoral zone (200 mm annual rainfall), the South Australian Strongwool Merino thrives on sparse pasture, provided perennial bush such as this bluebush (*Maireana* spp.) is available. (Below) Fresh water collected in dams or earth tanks enables sheep to browse saltbush (*Atriplex* spp.) and bluebush (*Maireana* spp.) which contain more than 20 per cent of salt in their leaves.

Grazing in harsh conditions





This South Australian Strongwool Merino ram has been fed supplements and grazed on lucerne from 18 to 30 months of age. Weight: about 150 kg. Cut: over 15 kg of medium wool (22 to 24 microns).

Dual purpose breeds

When the original Saxon superfine Merinos did not do well in the dry pastoral zone of Australia, South Australian stud breeders set about developing a breed type that would thrive.

Although not shown in the breeding records, it is almost certain that some British longwool blood was involved in the early stages. The resultant skilful selection in breeding has developed a distinct type of large-framed, plain-bodied, open-faced sheep with long-stapled, slow-crimping, creamy coloured wool and high fleece weights.

These sheep walk well in the dry pastoral zone where there are long distances to feed and water. They are the highest wool-producing strain of Merino in Australia but suffer some problems from fleece rot and blowfly strike in the higher rainfall areas. Selection against these problems is reducing their incidence rapidly.

Purpose

The South Australian Merino is a dual purpose strain of Merino developed for the pastoral zone and suitable for the cereal zone. Large-framed ewes can be joined directly with Down breed rams (mainly Dorsets) to produce early prime lambs for which there is a premium in early spring markets and heavyweight lamb markets.

The visually strong South Australian Merino wool often measures finer than it looks and is currently in keen demand (sometimes exceeding the price for

Characteristics

- | | |
|--|--|
| Colour of head and legs or feet | — soft white open face with pink skin, although some brown or small black spots on the skin of the nose or ears may be tolerated if there are no black wool fibres growing in them. Kemp fibres are not tolerated. |
| Mature bodyweight (kg) | — rams 50 to 100 (some individuals fed under show conditions will weigh up to 150 at three years of age); ewes 45 to 60. |
| Wool quality number (microns) | — average 24, range 21 to 26. |
| Greasy fleece weight (kg) | — average 5.5, range 4 to 8. |
| Staple length (cm) | — average 9, range 8 to 12. |
| Fertility | — the strain averages 75 per cent of lambs marked to ewes mated but individual flocks have produced over 100 per cent and up to 130 per cent. |

finer wool). The strain has spread to all Australian States, particularly in the pastoral and cereal zones where the high fleece weight and ability to thrive in a hot, dry climate on sparse bushes and grasses are valuable features.

Adaptation

The South Australian strain has adapted well to the dry conditions of much of Australia between latitudes 15 and 35. Individual flocks are being developed to suit higher rainfall conditions by selecting for soft, pearly white wool, which, although lighter in fleece weight, is more resistant to fleece rot and blowfly strike.

The open-faced, plain body makes this strain an "easy-care" sheep, particularly for management in arid to semi-arid country.

South Australia has 360 Merino studs of Australia's total of 1 500.

Availability

All seven parent studs of the South Australian strain, comprising 44 000 stud ewes, are in the State's cereal zone (400 mm annual rainfall). The Collinsville family of studs is now the largest Merino stud group in Australia. There would be no difficulty in purchasing top quality rams at auction sales.

Before the Merino export embargo was imposed in 1929 Australian Merinos, including sheep from top South Australian parent studs, were sold overseas, mainly to South American countries, South Africa and Russia. When the embargo was partially lifted in 1968 South Australian Merino rams went to South American countries, particularly Argentina, South Africa, Russia and China.

South Australian Merino



Stud Polwarth ewes in hilly country sown to improved pastures at Inman Valley, South Australia (800 mm annual rainfall). These ewes have been fed supplements in a shed.

The Polwarth breed was established in Victoria on three properties by crossing the Lincoln with the white wool fine Merino and then mating the half-bred progeny back to the Merino to produce three-quarter bred Merino progeny. The progeny were then interbred to establish the Polwarth breed.

The Polwarth has become popular in many of the wetter, colder areas because of its thrift and good growth rates of young sheep under conditions where young Merinos do not thrive as well.

Selection has been practised towards a high-yielding, soft, pearly white wool that is relatively resistant to wet conditions, fleece rot and body fly-strike. The long, free-growing wool tends to bend over at the tip and acts like a roof to run water off. This long wool, after being drenched by rain, dries out quickly in wind.

Purpose

The Polwarth breed is a dual purpose breed with almost equal emphasis on wool and meat. Wether lambs can be sold as prime lambs to the abattoirs or grown out to mature bodyweights and kept as wool producers or sold for the live sheep trade to the Middle East. This market requires over 50 kg liveweight at two to five years of age.

Ewes are run as a pure breed for wool production or joined directly with shortwool meat sires like the Dorset or Suffolk to produce prime lambs for the local market. Alternatively, Polwarth ewes can be joined with Border Leicester rams to produce highly fecund first cross prime

Characteristics

| | |
|---------------------------------|--|
| Colour of head and legs or feet | — soft white face with pink skin on the nostrils, white legs and feet. There should be no kemp fibres on the face or legs. There may be black mottles on the nose. |
| Mature bodyweight (kg) | — rams 60 to 80, ewes 45 to 65. |
| Wool quality number (microns) | — average 23, range 21 to 25. |
| Greasy fleece weight (kg) | — average 5.0, range 4.0 to 6.0. |
| Staple length (cm) | — average 12, range 10 to 14. |
| Fertility | — better than Merino. In many flocks over 100 per cent of lambs are marked to ewes mated. |

lamb mothers with a reproductive rate of over 120 per cent of lambs marked to ewes mated.

The unique role of the Polwarth breed is that it can be run as an "easy-care" flock in cold, wet areas with over 500 mm of rainfall annually. They are also run in the drier cereal zone with 300 to 500 mm of rainfall. Their large, plain bodies and free-growing wool make for easy shearing. The ewes can be left to lamb unattended because they experience few lambing difficulties.

Until the Merino embargo is fully lifted, South Australian Polwarths are the nearest exportable breed of ewes to the highly productive South Australian Merino.

Adaptation

Mr. E.I. Ashby of "Mt. Alma" stud in South Australia has adapted the Polwarth and virtually developed a separate strain of highly productive sheep. They would be among the most productive Polwarths in Australia with a 3 000 ewe flock averaging

6 kg of wool per head, 55 to 65 kg bodyweight, over 100 per cent of lambs marked regularly and a finer fleece than many Polwarths in other States (21 to 24 micron wool of 70 to 80 per cent yield). This has been achieved by performance recording of a pedigreed stud flock with selection for clean fleece weight and finer fibre diameter, bodyweight and reproduction rate.

Availability

Although South Australia has only a few Polwarth studs, it has one of the best in Australia with some 3 000 stud ewes, all of which have been bred with the aid of performance recording from individually mated rams. There are 1.4 million Polwarths in Australia.

Stud rams and ewes are available for immediate delivery or for production under long-term contracts.

Successful sales of South Australian Polwarths have been made to a number of South American countries and India.

Polwarth



Corriedale stud rams on improved pasture at Inman Valley, South Australia (800 mm). Sheep dogs are used extensively in Australia.

The Corriedale breed was established late last century almost simultaneously in Australia and New Zealand by reciprocal crosses between the English longwool Lincoln breed and the Australian Merino.

In New Zealand, Lincoln rams were crossed with Merino ewes after some less successful crosses with Romney Marsh and English Leicester rams. In Australia, Merino rams were crossed with Lincoln ewes.

In both cases, the half-bred progeny were selected rigorously to a defined type and interbred.

Purpose

The Corriedale is a versatile true dual purpose breed with equal emphasis on meat and wool production. Corriedales thrive in areas receiving 500 to 700 mm annual rainfall and are a most useful sheep for big and small flock owners.

The wether portion of the breeder's flock can be sold as prime lamb off their mothers or shorn and fattened to supply the out-of-season lamb market in autumn-winter. At as early as 18 months of age, Corriedale wethers are heavy enough to supply the Middle East live sheep trade. Alternatively, Corriedale wethers are profitable, "easy-care" wool producers up to five years of age.

Corriedales are also mated with English longwool breeds like the Border Leicester. The cross produces highly fertile prime lamb mothers (130 per cent lambs marked not uncommon) cutting profitable fleeces of 5 to 6 kg of strong crossbred wool (30 to 34 microns).

Many top quality prime lambs are produced by using British breed shortwool rams over mature Corriedale ewes, which are noted for their ease of lambing.

Adaptation

Corriedale is a hardy breed adapted to a wide range of conditions. In wetter areas selection is towards softer, whiter wool with greater resistance to fleece rot and body strike. These type of fleeces shed the rain and dry quickly in extreme conditions. The ability of young Corriedales to grow meat and wool under cold, wet conditions is a great commercial feature of the breed.

Availability

South Australia has the largest Corriedale stud flock in Australia and about 570 000 Corriedales overall.

Many South Australian studs and flocks produce the type of animals sought by overseas buyers. Large consignments can be arranged for immediate delivery or for production under contract.



A Corriedale stud ram.

Characteristics

| | |
|---------------------------------|---|
| Colour of head and legs or feet | — white face with dark skin on nostrils, legs white and hooves preferably dark. |
| Mature bodyweight (kg) | — rams 90 to 100 ewes 55 to 70 |
| Wool quality number (microns) | — average 28, range 25 to 32. Used in average yarn clothing, knitting yarns, furnishings, and felt for paper manufacture. |
| Greasy fleece weight (kg) | — average 6, range 5.5 to 6.4. |
| Staple length (cm) | — average 16, range 15 to 18. |
| Fertility | — lambing percentages of 100 and over can be expected, with individual flocks producing over 130 per cent of lambs. |

Successful sales of Corriedales have been made from South Australia to a number of South American countries, India and Libya.

Corriedale



A flock of stud Border Leicester ewes on improved pastures in spring at Ashbourne in the Southern Adelaide Hills (650 mm).

Border Leicester, an English long-wool breed, has an important role in Australia for crossing with Merino ewes to produce first cross prime lamb mothers.

When crossed with the Merino, first cross ewes exhibit a marked degree of hybrid vigour. Ewes of the cross invariably produce at least 20 per cent more lambs than any other cross in Australia. It has been clearly shown that efficiency and profitability of prime lamb production is largely dependent on the fertility and lambing performance of the

prime lamb mothers. Furthermore, these ewes produce quite a profitable fleece of crossbred wool.

Purpose

The Border Leicester breed is run only in its pure state in stud flocks for ram breeding. The rams are joined with Merino ewes — preferably the large-framed, plain-bodied South Australian Strong-wool Merino ewes from the pastoral zone which in themselves are likely to be more fertile.

The first cross ewes are then transported to the higher rainfall zone where the pasture growing season is long enough (seven to nine months) to permit mating in the autumn when the reproduction rate will be at a maximum and the lambs can still be finished for market off their mothers. Crossbred ewes are also used for prime lamb production in the better areas of the cereal zone.

There were 5 027 stud Border Leicesters in South Australia in 1977.

The crossbred wool measures 25 to 35 microns, depending on the strain of Merino used, with fleece weights of about 5 kg. Wool contributes almost 50 per cent of returns per head.

Adaptation

First cross ewes are adapted to a wide range of environments but reach their maximum production in the high rainfall zone. They are excellent mothers and lamb losses as low as two to four per cent are common.

Their excellent milking ability ensures rapid lamb growth rate. The bare head, legs and crutch of the pure breed impart this characteristic to the progeny, which are consequently easy to care for.

Availability

South Australia had 44 Border Leicester stud flocks with about 5 027 stud ewes in 1977. Orders for stud ewes and rams can be taken for immediate delivery or under long-term contracts. South Australia has received many overseas enquiries on its highly productive Border Leicesters, including from the U.S.A.



A Border Leicester stud ram.

Characteristics

| | |
|---------------------------------|---|
| Colour of head and legs or feet | — white face with no wool on the head or legs; polled. |
| Mature bodyweight (kg) | — rams 90 to 115, ewes 55 to 75. |
| Wool quality number (microns) | — average 36, range 32 to 38; ideal for preparing wools (coarser than 30 microns and longer than 17 to 20 cm). |
| Greasy fleece weight (kg) | — average 6, range 5.5 to 6.5. |
| Staple length (cm) | — average 22, range 20 to 25. |
| Fertility | — for the pure breed in S.A. usually 100 to 120 per cent of lambs are marked to ewes mated. First cross Border Leicester-Merino ewes, however, will produce 120 to 150 per cent of lambs. |

Border Leicester

Romney Marsh, an English long-wool breed, is confined more to the high rainfall zone to which it is well adapted. The rams are joined with Merino ewes to produce first cross prime lamb mothers. There were 9 868 Romney Marsh sheep in South Australia in 1977.

Purpose

In South Australia the Romney Marsh is run only in its pure state as stud flocks for ram breeding. The rams are usually joined with Merino or Polwarth ewes — preferably the large-framed, plain-bodied ewes from the pastoral zone which are likely to be more fecund. The first cross ewes are then transported to the high rainfall zone where the season of green pasture is long enough (seven to nine months) to permit mating in the autumn when fertility will be at a maximum and the lambs can still be finished for market off their mothers.

The crossbred wool measures 24 to 30 microns, depending on the strain of Merino used, with fleece weights about 5 kg.



A Romney Marsh stud ram.

Adaptation

The first cross ewes are best suited to the wetter areas of the State.

In New Zealand, the Romney Marsh is usually run as a pure breed except in the steep hilly country. Sir Geoffrey Peren crossed the Cheviot with the Romney to produce a new breed called the Perendale. This breed can walk better on steep hills and has a finer, more valuable fleece.

Availability

South Australia had 11 Romney Marsh studs with 2 000 stud ewes in 1977.

Stud rams and ewes are available in limited numbers. Commercial first cross Romney Marsh-Merino cross ewes are available for immediate delivery or under long-term contracts.

Characteristics

| | |
|---------------------------------|---|
| Colour of head and legs or feet | — white face with white kemp fibres on the non-wool-bearing areas of face and legs. Some sheep are muffled; polled. |
| Mature bodyweight (kg) | — rams 90 to 110, ewes 55 to 70. |
| Wool quality number (microns) | — average 33, range 30 to 35; ideal for preparing wool (coarser than 30 microns and longer than 13 to 20 cm). |
| Greasy fleece weight (kg) | — average 6, range 5.5 to 6.5. |
| Staple length (cm) | — average 20, range 18 to 23. |
| Fertility | — for the pure breed usually 100 per cent of lambs are marked to ewes mated. First cross Romney Marsh-Merino ewes will produce 110 to 130 per cent of lambs marked to ewes mated. |

Romney Marsh



Cormo ewes and lambs on the home stud property at "Dungrove", Bothwell, Tasmania.

Cormo, a dual purpose breed, was established in Tasmania in 1963 by Mr. B.C. Jefferies of the South Australian Department of Agriculture and Fisheries while he was in the Tasmanian Department of Agriculture working in co-operation with Mr. I.K. Downie of "Dungrove", Bothwell, Tasmania.

The characteristics of economic importance were defined and the sheep selected and bred towards this goal with the aid of measurement of economic characters

(fleece weight, fibre diameter, bodyweight and reproductive performance). The breed was developed in the highlands of Tasmania as suitable for both improved and unimproved bush country in a cold, wet climate. The first wool was purchased by a Japanese mill and made into a special cloth called Donicormo which sold at twice the price of similar fabrics.

South Australia has no Cormo studs but there are several commercial flocks on Kangaroo

Island. Rams and ewes can be produced by contract or negotiation with Mr. Downie who has sent rams to other States of Australia, Argentina, New Zealand, China and U.S.A.

Cormo

Shortwool breeds

The Dorset Horn became the most popular sire for the production of prime lamb in Australia following the excellent work by the major stud breeders. Indeed, some South Australian Dorset Horn rams have won major prizes at livestock shows in Britain against strong competition from the parent breeders. The breed has been developed in Australia, particularly for the cereal zone, as a sire that can produce rapidly growing first or second cross lambs when mated to Merino ewes.

First cross Dorset x Merino lambs have a dual outlet in that the prime wether lambs can go direct to market while the ewe lambs can either go to market as prime lambs or be sold as first cross prime lamb mothers. As first cross mothers they have a significant role to play in the lighter-soil early districts. Their breeding season is longer than that of other crossbreds and allows them to be joined with either Dorset rams again or Suffolks or other breeds in November-December to produce early premium prime lambs the following September when there is a distinct market shortage.

Purpose

The Dorset Horn is ideal as a sire for prime lamb production, particularly in the early districts of the cereal zone. The breed has also adapted to high rainfall conditions as well. The rams are able to impart their excellent meat qualities to the progeny of Merino ewes, particularly the large-framed, strongwool South Australian Merino.

A group of seven to eight-month-old stud Dorset Horn rams at Sandy Creek in the hills north of Adelaide (450 mm). These rams must be well grown to sell at 12 months old.

Characteristics

| | |
|---------------------------------|--|
| Colour of head and legs or feet | — clean white face and legs with pink skin and white feet. Both ewes and rams are horned. |
| Mature bodyweight (kg) | — rams 90 to 110, ewes 55 to 75. |
| Wool quality number (microns) | — average 27, range 25 to 30; the wool is used for hosiery and felts. |
| Greasy fleece weight (kg) | — average 2.5, range 2.3 to 2.7. |
| Staple length (cm) | — average 9, range 8 to 10. |
| Fertility | — for the pure breed fertility may range from 70 to 100 per cent of lambs marked to ewes mated (first cross Dorset x Merino ewes will produce 110 to 130 per cent of lambs). |
| Lamb skins — dry (kg) | — 2.3 to 2.8 (at 3 to 4 months of age, unshorn). |

In all breed comparison trials in Australia, the Dorset Horn (and more recently its polled relation) has produced the fastest growth rate in lambs up to four months of age when they are marketed off their mothers. The rams are also very popular for mating with first cross prime lamb mothers, particularly the Border Leicester x Merino in the high rainfall zone. Although the Dorset x Merino has the advantage of a longer breeding season than other British breed crosses, the wool cuts are at least 1 kg a head less. Dorset x Merino prime lambs carried on to nine to ten months of age are ideal heavy weight lambs with excellent conformation without excess fat.

Adaptation

The Dorset Horn has adapted well to Australian conditions of erratic rainfall and Mediterranean climate. The breed's early matur-

ity and long breeding season make it ideal for early, light soil districts. The lambs seem able to withstand a check.

The white face and points make the breed popular in the sheep industry. The wool of Dorset Horn x Merino ewes or Dorset cross lambs therefore is of good value.

Availability

South Australia had 27 Dorset Horn studs in 1977, comprising 2 000 stud ewes. Australia had 423 Dorset Horn studs. There would be no problem in buying good quality stud rams for immediate delivery or under long-term contract.

Dorset Horn



The Poll Dorset was developed from the Dorset Horn by introducing poll genes from the Ryeland breed in two cases and from the Corriedale in South Australia, with backcrossing to the Dorset Horn. The dominant poll characteristic is indicated by depressions at the horn sites with or without small, loosely attached horn buds.

The Poll Dorset is now the most popular prime lamb sire in Australia.

Purpose

The rapid increase in numbers of Poll Dorsets in South Australia shows clearly the breed is growing in popularity and effectiveness as a sire for prime lambs weighing 15 to 18 kg carcass weight. First cross Dorset prime lambs, owing to their white wool and fast growth rate, also are of value and in demand at the carry-over stage after weaning for sale in the autumn markets.

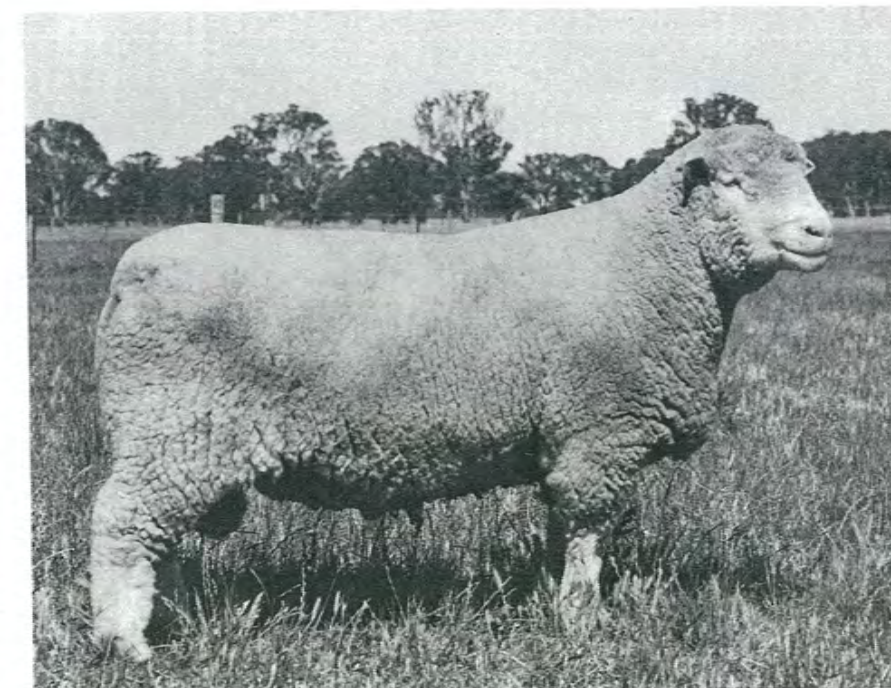
Adaptation

The Poll Dorset is popular in the drier cereal zone because of its longer breeding season compared with other British breeds and the faster growth rates of the lambs. The growth rates allow the lambs to be finished for market before pastures dry on the zone's lighter soils in September. Producers are able to capitalize on the premium prices for earlier prime lamb.

Availability

There are a number of high-quality, performance recorded Poll Dorset studs in South Australia. Orders for stud rams or ewes can be taken for immediate delivery or under long-term contracts.

Stud Poll Dorset ewes on improved pastures in summer near Bordertown in the Upper South-East of South Australia (425 mm).



A high-priced Poll Dorset stud ram on a property at Bordertown in the Upper South-East of South Australia.

Characteristics

| | |
|---------------------------------|---|
| Head | — polled and broad with wool from brow to poll, but open face. |
| Colour of head and legs or feet | — white face with pink skin on nose; legs and hooves white. |
| Mature bodyweight (kg) | — rams 90 to 110, ewes 55 to 75. |
| Wool quality number (microns) | — average 26, range 25 to 28; good for hosiery trade and felts. |
| Greasy fleece weight (kg) | — average 2.5, range 2.2 to 2.8. |
| Staple length (cm) | — average 8, range 7 to 10. |
| Fertility | — some pure flocks have relatively low fertility. First cross Dorset x Merino ewes usually have medium to good fertility with 100 to 120 per cent lambs marked to ewes mated. |
| Lamb skins — dry (kg) | — 2.3 to 2.8 (at 3 to 4 months of age, unshorn). |

South Australia had 161 Poll Dorset studs in 1977, comprising 17 000 stud ewes. Australia has a total of 1 225 Poll Dorset studs. Good quality stud stock are readily available. Some large enquiries have come from Chile.

Poll Dorset



The Suffolk breed was formed by crossing Southdown rams on the old Norfolk horned breed of ewes and accepted as a pure breed in 1810.

Along with the Dorset, the Suffolk would be the most popular breed in South Australia for use as a prime lamb sire.

Purpose

The Suffolk would be the largest of the Down breeds used in Australia. The breed is usually run in its pure state in stud flocks to breed prime lamb sires which are then joined in the cereal zone either with large-framed South Australian Merinos or first cross ewes.

At the sucker stage, the growth rate of Suffolk-cross lambs is similar to that for Dorset cross lambs. At the carry-over stage, however, when lambs are weaned, shorn and fattened for autumn markets in the high rainfall zone, Suffolk cross lambs tend to grow faster with less fat than other Down crosses. Hence they are popular for producing heavy-weight lambs for either the local or the American trade.

Adaptation

The Suffolk breed has been adapted to Australian conditions and is used extensively in the cereal and high rainfall zones. Selection against black fibres in the fleece is recommended.

Availability

There are excellent Suffolk studs in South Australia. Orders for stud rams or ewes can be taken for immediate delivery or under long-term contract.

A group of Suffolk stud ewes and lambs at the Urrbrae Agricultural High School, Adelaide (550 mm).



A Suffolk stud ram on a property at Bordertown in the Upper South-East of South Australia.

Characteristics

| | |
|---------------------------------|--|
| Colour of head and legs or feet | — the head, legs and feet are all black and free of wool; polled. |
| Mature bodyweight (kg) | — rams 90 to 120, ewes 55 to 75. |
| Wool quality number (microns) | — average 27, range 25 to 28. |
| Greasy fleece weight (kg) | — average 2.5, range 2.3 to 2.7. |
| Staple length (cm) | — average 8, range 7 to 9. |
| Fertility | — one of the most prolific of the Down breeds. The pure breed is used as a prime lamb mother in Britain, with lambing percentages of about 150 per cent. |
| Lamb skins — dry (kg) | — 2 to 2.5 (at 3 to 4 months of age, unshorn). |

South Australia had 83 Suffolk studs in 1977, comprising 4 838 stud ewes. Australia has 408 Suffolk studs comprising 17 000 stud ewes.

Suffolk

The loss of the British market for light, early maturing prime lamb caused producers to look for a faster growing breed than the Southdown that could still be finished on available green feed. Consequently, the South Suffolk was developed to incorporate the outstanding conformation of the Southdown and the fast growth rate of the Suffolk by crossing the two breeds.

Purpose

South Suffolks are usually run only as pure bred stud animals to breed prime lamb sires. The sires are usually joined with first cross ewes in the high rainfall zone where their excellent meat-producing qualities can be fully expressed in the longer growing season.

Adaptation

South Suffolk is being adapted to Australian conditions after its introduction from New Zealand. Producers using the breed have found that the lambs grow rapidly and show excellent carcass conformation.

Availability

South Australia had seven South Suffolk stud flocks in 1977, comprising 327 stud ewes. Australia had 105 stud flocks comprising 5 754 stud ewes. The breed has developed rapidly and stud animals are available for immediate delivery or under long-term contract.

South Suffolk ewes and lambs on improved pastures in high rainfall country (800 to 1 000 mm) south of Adelaide.



A South-Suffolk stud ram.

Characteristics

| | |
|---------------------------------|---|
| Colour of head and legs or feet | — the head, legs and feet are brown to black with some wool on the face, although open faces are preferred; polled. |
| Mature bodyweight (kg) | — rams 80 to 110, ewes 50 to 70. |
| Wool quality number (microns) | — average 25, range 24 to 27. |
| Greasy fleece weight (kg) | — average 2.4, range 2.1 to 2.6. |
| Staple length (cm) | — average 7, range 5 to 8. |
| Lamb skins — dry (kg) | — 1.9 to 2.4 (at 3 to 4 months of age, unshorn). |

South Suffolk



Ryeland ewes on improved pastures in South Australia's South-East (600 to 700 mm).

Other Shortwool breeds

Other shortwool breeds are available in small numbers but could be produced under contract or by negotiation with stud breeders in other Australian States. They are:

Hampshire Downs

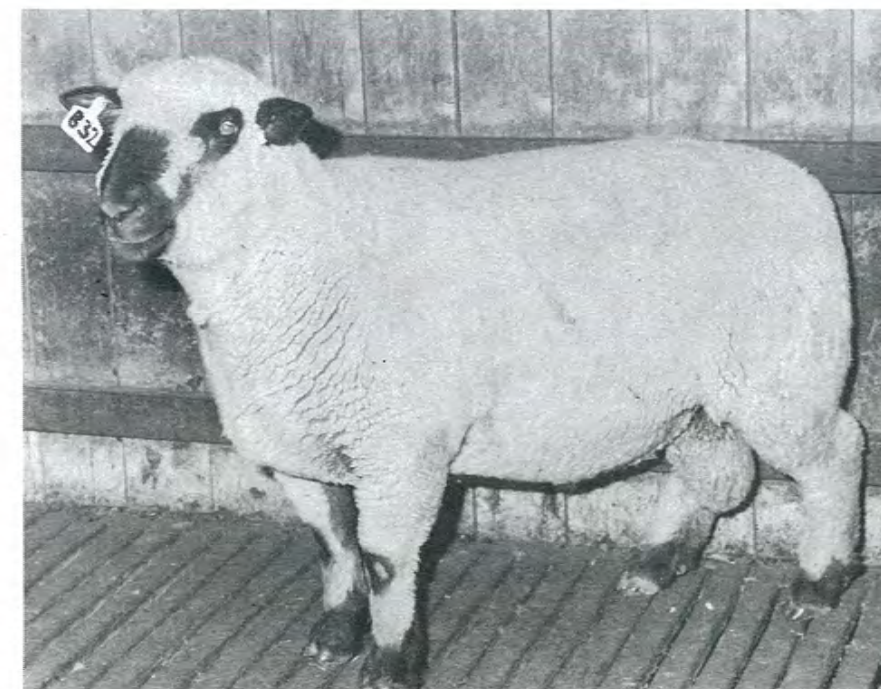
This brown to black-faced heavy-weight breed is growing in popularity as a sire for fast-growing heavyweight lambs. South Australia has five studs comprising 500 stud ewes. Australia has 21 studs.

Ryeland

A very old breed, Ryeland is polled with white face and legs. This breed was used to introduce the poll gene into the Dorset Horn to make the Poll Dorset. South Australia has 18 studs comprising 1 400 ewes. Australia has 76 studs.

Southdown

The loss of the British market which favoured lightweight first quality lamb has led to a decline in popularity of the old Southdown breed which has long been taken as the standard for carcass quality. Lambs are ready for market at 13 to 15 kg carcass weight (26 to 30 kg liveweight). South Australia has seven Southdown studs comprising 500 ewes. Australia has about 261 studs.



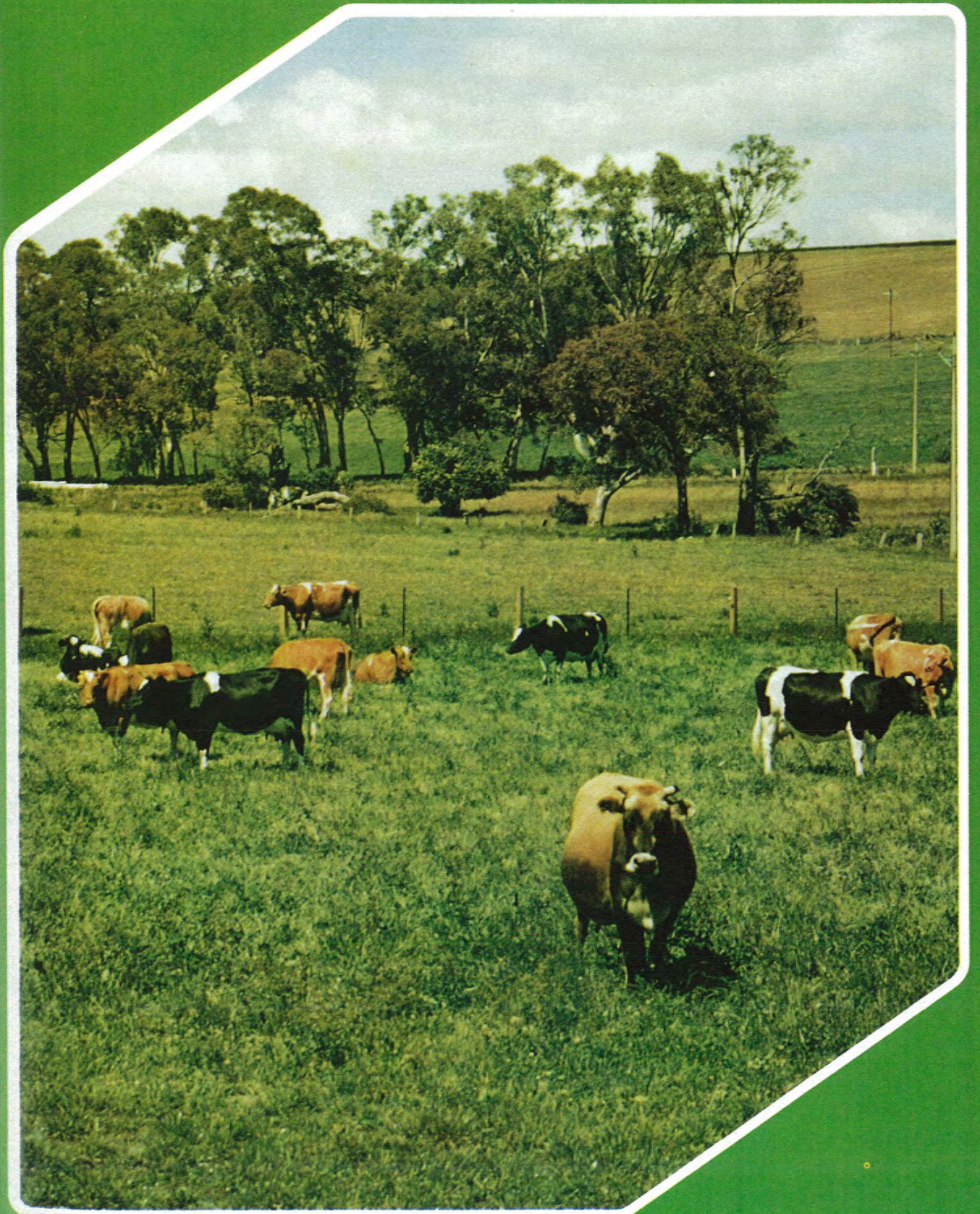
A Hampshire Down stud ram on a property near Naracoorte in the South-East of South Australia.



A Southdown stud ram.

Hampshire Downs, Ryeland and Southdown

DAIRY CATTLE



Dairy cattle

The South Australian dairy cattle population was fairly stable from 1955 to 1966 at about 165 000 cows (in milk and dry) and about 80 000 younger animals from calves to two-year-olds. Since 1966, the number has declined to 123 000 cows (in milk and dry) with 56 000 younger stock. The decline is the result of economic pressures within the industry.

South Australia's major dairying areas are the high rainfall zone's Lower South-East and Adelaide Hills, plus the irrigation areas of the Lower Murray and the Lakes. Dairying is carried out to a lesser extent in the Upper South-East, on Yorke Peninsula and Eyre Peninsula, and in northern areas where it is often a sideline to other farming operations. There is no dairying in the far north region.

Dairy cattle feeding in South Australia is based on pasture grazing. Lot feeding is limited to only a few dairymen. Because the carrying capacity of dairy farms is related to the amount of feed grown over a year, it is necessary to harvest excess spring pasture growth as hay or silage and feed it back in times of shortage in late summer to winter. In times of fodder shortage feeding may be supplemented with cereal grains, which are also used to achieve higher production per cow.

Pasture fodder feeding, which applies to young weaned stock as well as the milking herd, produces animals of less bodyweight than animals fed a grain ration during growth.

Average production of herds under test is 3 400 litres of milk and 150 kg of milk fat. Some well-managed herds using grain concentrates in their feeding produce over 230 kg of milk fat a cow.

The composition of breeds in South Australia has changed since 1970, with Friesian and Jersey increasing their percentages at the expense of Guernsey and Crossbred. No precise figures are available. Estimated percentages for 1978 are in the order of Friesian 57, Jersey 23, Guernsey 3, AIS 1.5, Ayrshire 0.5, Crossbred 15.

The main breeds are found in all dairying areas of the State and adapt fairly readily to the wide range of climatic conditions. The breed pattern has changed considerably over the years with the numbers of Friesian and Jersey cattle reversing. Friesians achieved popularity because of their value as culls and calves, and their suitability for dairy beef and crossing with beef breeds.

Breeding

Over the years, South Australian dairy herds have developed from a mainly crossbred population to one that is mainly pure-bred or predominantly one breed grade cattle. This has been achieved by using pure-bred sires from stud herds. At the same time, greater emphasis has been placed on the production backing of the sires purchased. The majority of pure-bred herds supplying sires for the commercial herds are under test.

Artificial breeding, although not widely used at present, has been used in South Australia for a

number of years. Local and overseas sires have been used with the demand gradually swinging to the use of proven sires. The continued use of semen from proven sires should improve the production potential of South Australian dairy cattle. Pure-bred or stud herds have the dual responsibility of maintaining or improving not only production but type.

The South Australian Department of Agriculture and Fisheries supports the use of herd testing and artificial breeding as methods of improving the potential of dairy cattle to produce milk and milk solids.

Availability

The availability of dairy cattle from South Australia depends on price and continuity of demand. Dairy farmers can expand the numbers of stock, pure-bred or crossbred, if demand is constant at an acceptable price. They can also produce cattle to meet the requirements of various markets.

In addition to pure-bred stock, there are grade and crossbred herds with good production figures. They are capable of producing progeny with good potential for dairy production or they can be used to produce beef cross progeny. The most popular crossbred is the Friesian x Jersey.

South Australia has already exported dairy cattle to many countries.

Dairy cattle numbers in South Australia by breed (1970)

| | Number | Percentages |
|------------------------------------|---------|-------------|
| Friesian | 122 700 | 52 |
| Jersey | 43 700 | 18.5 |
| Guernsey | 16 500 | 7 |
| Australian Illawarra Shorthorn | 4 700 | 2 |
| Ayrshire | 1 200 | 0.5 |
| Crossbred | 47 200 | 20 |
| Total dairy cattle including bulls | 236 000 | |

Source: Australian Bureau of Agricultural Economics.

Meat production

Except for surplus animals, pure dairy breeds are not used directly for meat production. They are used to cross with beef breeds to give half-bred mothers with an increased milking ability. The lowest producing cows in a dairy herd are often mated with beef bulls. Beef-bred cows are often mated with dairy bulls to produce crossbreds. The crossbred cows when mated back to a beef bull provide extra milk for the calf and high growth rates.

The larger dairy breeds, the Friesian and Australian Illawarra Shorthorn (AIS), mature later than the British beef breeds and it is difficult to produce prime weaners using beef bulls and Friesian cows. The milking ability of the Friesian and AIS is good and the two breeds can be used for multiple suckling. Post-weaning growth depends on inherent size and nutrition. Carcass conformation is acceptable and an average mature Friesian bull weighs about 1 000 kg.

The Jersey, the smallest dairy breed, matures earlier with a good milk supply which, being higher in milk fat and total solids, is particularly suitable for suckling growing beef calves. Growth rates to weaning are good but post-weaning growth tends to be lower than the larger breeds. Carcass conformation is poor but meat quality is good, except for a tendency to yellow fat. Jerseys have less calving problems than other breeds.

The growth rates and carcass conformation of the Guernsey and Ayrshire are between that of the large and small breeds.



Dairy breeds

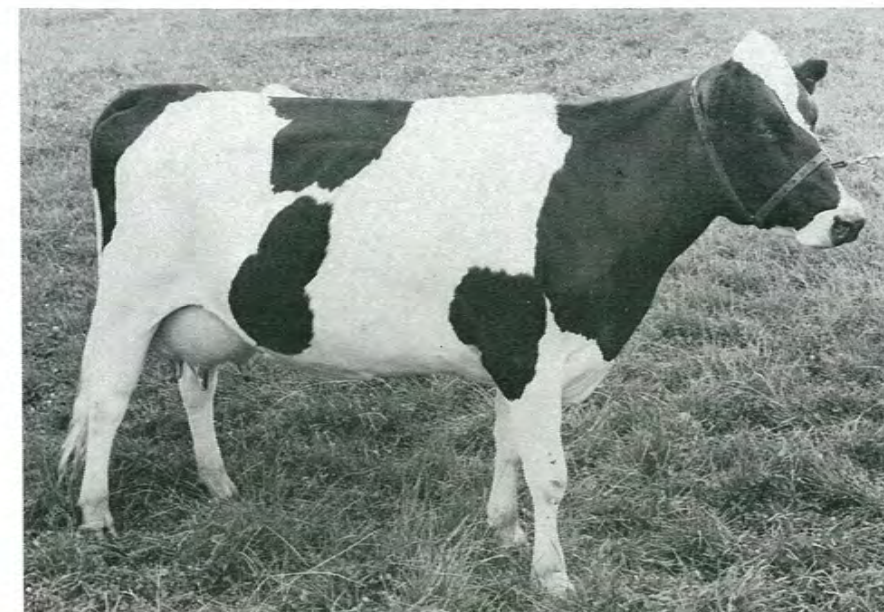
It is not known when the Friesian breed, which originated in the provinces of North Holland and Friesland, first came to Australia, but imports were recorded in the 1850s. The Friesian Cattle Club of Australia was formed in 1914 and the breed has increased in popularity over the past few years. A type classification system has helped to improve the type and conformation.

Characteristics

Generally, Friesian cattle are black with white markings, although there can be considerable variation in the proportion of black and white. In some animals, a colour factor for red results in red and white cattle. Longer winter coats may carry a brownish tinge at the tip.

The Friesian is one of the largest breeds of dairy cattle, being big-framed with a long, deep body, flat bones and good udder development. Weight varies from 590 to 680 kg for mature females, with males about 1 000 kg. The present trend is to increase height while maintaining weight and conformation.

The Friesian is noted for high yields of milk and milk solids, although percentages of milk solids are lower than some of the other breeds. The average production of pure-bred Friesians in



A typical Friesian cow from one of South Australia's top-producing herds.

South Australia is about 4 500 litres of milk and 180 kg of milk fat at an average test of 3.9 per cent.

Purpose

Friesians, which are docile and easily handled, are used primarily to produce milk for whole milk and manufactured products. They are also used for meat production as a straight breed or for crossing with beef breeds.

Friesians are found throughout the dairy areas of Australia and adapt readily to the range of climatic conditions, but they are

more suited to areas of higher feed production such as South Australia's high rainfall zone and irrigation areas.

Availability

There are potential annual sales of 2 000 to 3 000 yearling heifers from stud and commercial herds in South Australia, with about 750 to 1 000 from herds under test.

South Australia has already exported Friesian breeding stock to many countries, including the Republic of Korea, Kuwait and Saudi Arabia.

A group of Friesians on an Adelaide Hills dairy farm grazing irrigated pasture. About 60 per cent of the dairy cattle in South Australia are Friesians.

Friesian

Jerseys originate from the English Channel Island of Jersey. They were imported into Australia over 150 years ago. The number of Jerseys in South Australia as a percentage of the dairy cow population has declined over recent years, but the position has now stabilized. A classification scheme helps breeders to continually improve the Jersey's conformation and production.

Characteristics

Jerseys vary in colour from light fawn to brown with some cattle carrying patches of white. There are few dark-coloured cows.

The udder conformation is generally good, blending well with the size and conformation of the animal. Jerseys are the smallest dairy breed but the fastest maturing. Weight varies from 360 to 450 kg.

Jerseys have moderate milk yields. The milk is high in fat, protein and total solids content. The average production of pedigreed Jerseys in South Australia is 2 900 litres of milk, testing 5.2 per cent fat and therefore containing 160 kg milk fat. This quantity is produced over an average lactation of 270 days. Jersey breeders are now aiming to improve milk yield without lowering the percentage of solids.

The breed is heat tolerant as indicated by cattle milking in hot, arid Central Australia. Ease of calving owing to large pelvic capacity makes the Jersey attractive for crossbreeding with beef bulls.

Jerseys of this type make up about 25 per cent of the dairy cattle in South Australia. They produce milk with a high solids content.



An example of the better type of Jersey cow seen in South Australian herds.

Purpose

Jerseys, which are docile and easily handled, are used primarily to produce milk for whole milk consumption. Some milk is used for manufactured products. Lower-producing animals in the herd may be mated advantageously with beef sires. The carcasses resulting from such crosses have a high meat to bone ratio.

Jerseys are used to achieve intensive stocking rates for high production of solids per hectare. The breed is found throughout the dairying areas of South Australia and adapts well to the range of climatic conditions across the whole of Australia.

Australian Jerseys have been exported to many countries, including India and Malaysia.

Availability

Over 1 000 heifers from South Australia could be available for sale each year. Of these, 300 would be from herds under test.

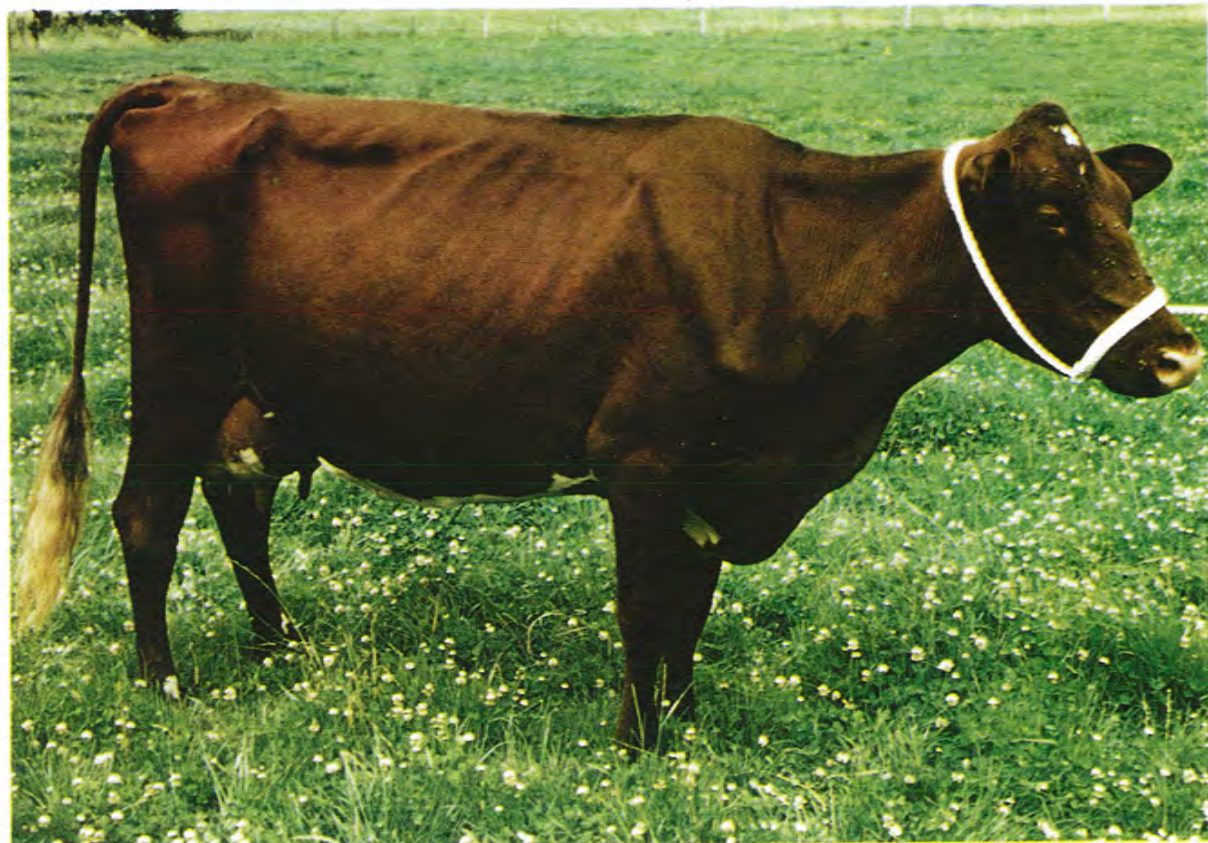
Jersey

Other dairy breeds



(Above) The Guernsey is noted for the production of yellow milk with high solids content.

(Below) This AIS cow in mid-lactation is one of the breed's better type animals in South Australia.



This Ayrshire cow is typical of the breed in South Australia.

Other dairy breeds include the Guernsey, Australian Illawarra Shorthorn (AIS) and Ayrshire.

The Guernsey, which has a body weight of 450 to 550 kg, produces a moderate amount of milk noted for its yellow colour and high solids content. Average production is about 3 200 litres of milk, 160 kg of milk fat, with an average test of 4.9 per cent.

The AIS, an Australian breed developed in the Illawarra district of New South Wales, is a slightly

heavier breed with a weight of 500 to 600 kg and an average production of 3 700 litres of milk, 150 kg of milk fat, with an average test of 4.0 per cent. The AIS is used to produce dairy beef and for crossing with beef breeds.

The Ayrshire produces milk of similar quality and quantity to that of the AIS, and has a slightly lower body weight of 475 to 575 kg.

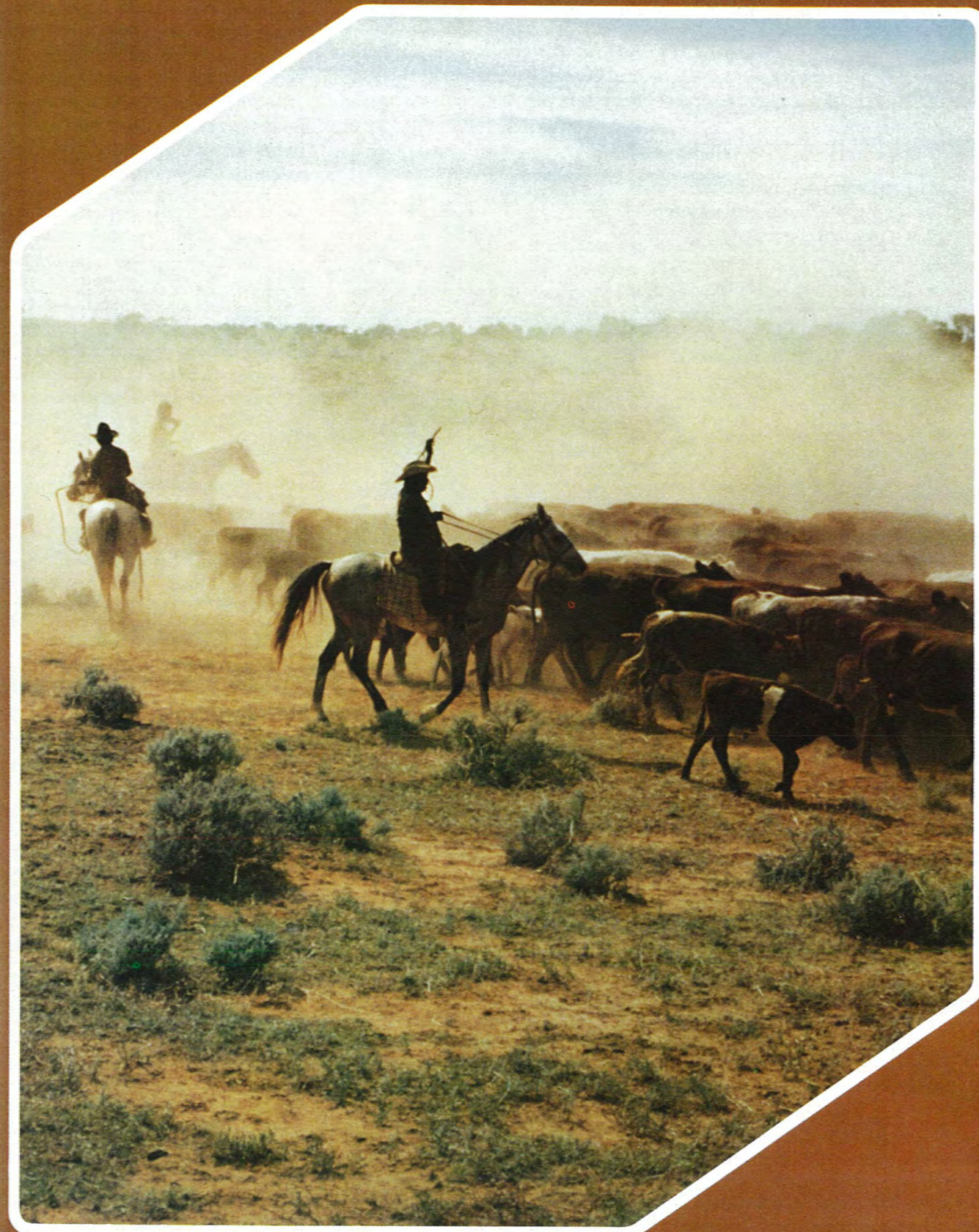
All three breeds are used primarily for the production of milk for whole milk and manufactured products and adapt readily to the range of climatic conditions in South Australia.

Availability

The number of animals available annually is about 250 to 300 for the Guernsey and AIS, with a lesser number for the Ayrshire.

Guernsey, Ayrshire and AIS

BEEF CATTLE



Beef cattle

Beef production is South Australia's second livestock industry after sheep and wool. The State has about 1.5 million beef cattle, eight per cent of which are registered with breed societies as purebreds or approved animals being bred up towards purity.

Most of South Australia's beef cattle are found in the high rainfall zone, particularly the South-East of the State. The distribution between zones is shown in Table 1.

Table 1: Distribution of beef cattle in South Australia.

| Zone (annual rainfall) | Number | Percentage |
|--------------------------|-----------|------------|
| pastoral (< 250 mm) | 188 000 | 13.2 |
| cereal (250 to 500 mm) | 363 000 | 25.5 |
| high rainfall (> 500 mm) | 872 000 | 61.3 |
| | 1 423 000 | 100.0 |

(Compiled from figures provided by Australian Bureau Statistics, 31/3/77.)

Table 2: Beef cattle numbers in South Australia by breed.

| Breed | Number | Percentage |
|-----------------|-----------|------------|
| Hereford | 56 900 | 4 |
| Poll Hereford | 327 300 | 23 |
| Shorthorn | 64 000 | 4.5 |
| Poll Shorthorn | 170 700 | 12 |
| Angus | 185 000 | 13 |
| Murray Grey | 56 900 | 4 |
| Red Poll | 34 100 | 2.4 |
| Red Angus | 8 500 | 0.6 |
| Simmental | 21 300 | 1.5 |
| Charolais | 12 800 | 0.9 |
| Limousin | 5 700 | 0.4 |
| Chianina | 4 300 | 0.3 |
| Brahman | 11 400 | 0.8 |
| Santa Gertrudis | 22 800 | 1.6 |
| Braford | 10 000 | 0.7 |
| Crossbred* | 427 000 | 30 |
| Others | 4 300 | 0.3 |
| | 1 423 000 | 100.0 |

*Cattle less than ¾ bred to any one breed.

(Source: Livestock Branch, S.A. Dept. of Agriculture and Fisheries, March, 1977.)

This book describes 15 breeds of beef cattle. The breeds are listed in Table 2 which shows that three of them make up nearly half the population. There are other breeds of cattle in the State, including South Devon, Devon, and Belted Galloway, but at present they are less numerous than the breeds included here.

Beef cattle in the farming system

Nearly all cattle in the cereal zone and most in the high rainfall zone are run as part of an overall system of sheep and cattle grazing and cropping. On some properties in the high rainfall zone and on pastoral zone stations north of the dog fence beef cattle are the sole enterprise.

Most cattle in the cereal and high rainfall zones are grazed on dry-land pastures. In areas that receive moderate falls of summer rain or have a good underground water table, lucerne greatly enhances the value of the pasture in summer. Lucerne is also important where irrigation is available.

Cattle are less selective in their grazing habits than sheep and more thorough users of rank or mature pasture growth and dry cereal stubbles. They complement the close grazing preference of the sheep — an important factor in their inclusion in the sheep and cereal farming system.

Cereal grain feeding is kept to a minimum. Maintenance quantities are sometimes fed to breeders and it is sometimes profitable to "top-off" slaughter cattle with six to eight weeks of grain and hay feeding before marketing. Both practices are more common during droughts or seasons when pasture supply is inadequate. They are less frequently necessary in the high rainfall zone.

In the pastoral zone, where there is no cropping, beef cattle are run very extensively — one beast grazing each 15 to 50 ha of sparse grass and shrubland. Turnoff of finished cattle is dependent on the short-lived growth of the grasses after spasmodic falls of rain that can occur at any time of the year. When grass growth is depleted edible shrubs provide maintenance.

Meeting the market

South Australian producers supply beef for local and export trade. Most producers in the cereal and high rainfall zones sell 8 to 10 months old weaners to the local trade, the supply peaking during November to January so that cows are not still suckling their calves during the summer period of pasture dormancy. It is advantageous to produce weaners and yearlings outside this period of greatest supply. Some producers are able to do this because of perennial pasture and lucerne in the high rainfall zone and lucerne and "topping-off" in some parts of the cereal zone.

When weaners are not in suitable condition for slaughter they may be grazed through to the next spring or early summer for sale as prime steers at 18 to 20 months of age. Such animals are often sold as store cattle from the cereal zone or drought-affected areas to the high rainfall zone where more pasture feed is available.

The pastoral zone produces mostly steers and bullocks of two to four years of age that are purchased mainly for export as manufacturing beef. The export trade also absorbs cull cows and older steers from the other two zones and many cattle from the pastoral country of neighbouring States. Only 26 per cent of beef produced in South Australia is exported — the balance being mostly weaner and yearling beef for local consumption.

The preferred animal for the home market is 9 to 12 months old with a carcass weight of 140 to 200 kg and an even fat cover measuring 5 to 10 mm over the eye muscle. The export demand is for cattle that are of at least 250 kg carcass weight and well muscled but not fat — 5 mm is ample.

There is a trend towards larger animals — up to 2 years old — for home consumption. This leads to increased efficiency of slaughter and processing. It also benefits production efficiency in areas where summer and autumn pasture supply is sufficient because less animals are required to yield the same amount of meat.

Breeding

Beef cattle in South Australia are bred to meet the market demand described in the previous section. In the high rainfall and cereal zones the main characteristics aimed for are:

- early sexual maturity, high fertility and ease of calving, so that each breeding cow produces a healthy calf at two or three years of age and each year of her life thereafter.
- good milk production so that the calf can be sold as a well-grown, well-finished weaner.
- early maturity so that weaners slaughtered at 8 to 10 months have the required fat cover.
- good muscle development so that carcasses have a high ratio of muscle to bone.
- large size to maximize production of meat per animal.
- structural soundness especially of feet, legs and mouths to maximize foraging ability and longevity.
- adaptation to the environment, particularly the hot, dry summers when it is necessary to efficiently utilize dry, low-quality roughage.

British breeds of beef cattle, mainly the Poll Hereford, Poll Shorthorn, Angus and Murray Grey, are most used to breed animals with the above characteristics. There is variation within

breeds, depending largely on the extent to which prime weaner production has been emphasized. Herds aimed at weaner production will have probably had most selection pressure placed on the first three of the listed characteristics, whereas those that have been bred for the production of 18 to 20 month beef may show greater evidence of the last three.

Discretion is used to ensure that too much emphasis is not placed on some characteristics at the expense of others. For instance, selection for size could cause more calving difficulties; and milk production should not be so high that the cow enters the dry season after weaning in low condition.

In the pastoral zone, where mature beef (two years and over) is produced by extensive grazing, the last two of the listed characteristics are the more important. Natural selection, aided only slightly by management, has produced strains of hardy cattle, particularly of the Shorthorn breed, that are well adapted to their arid environment.

Exotic breeds and crossbreeding

The role of the European and Zebu breeds, fairly recently introduced to South Australia, has still to be firmly established. These exotic breeds are relatively late maturing and therefore better suited to the production of 18 to 20 month beef. Nevertheless, when milk production is high, which depends largely on breed and pasture quality, turn-off of prime weaners is feasible.

Many herds, especially of the European breeds, are still being bred up towards purity by artificial insemination. At present, their most important contribution to commercial beef production is for crossbreeding with the British

breeds. The crossbred progeny of British and exotic breed parents receive part of the advantage of each breed in certain characters as well as benefiting from heterosis or hybrid vigour. For example, compared with the pure British breed, Simmental/British crossbred cows have higher milk production, Charolais/British crossbred calves have higher growth rates, especially post-weaning, and Brahman/British crossbred cows show greater tolerance to heat and semi-arid grazing. Compared with the pure exotic breed, the crossbreds are also earlier maturing, sexually and in carcass development.

Four main crossbreeding methods are used:

A. Non-continuous:

1. A cross between two breeds selling all progeny — for example, Angus x Santa Gertrudis.
 $A \times B \rightarrow AB$, all sold.
2. Use of a "terminal" sire with good carcass qualities on crossbred cows of two breeds — for example, Shorthorn x Friesian x Charolais.
 $A \times B \rightarrow AB \times C \rightarrow \frac{1}{2}C\frac{1}{4}A\frac{1}{4}B$, all sold.

B. Continuous:

1. Backcrossing crossbred progeny alternately to each of the two parent breeds — known sometimes as criss-crossing — for example, Poll Hereford x Simmental.
 $A \times B \rightarrow AB \times A \rightarrow \frac{3}{4}A\frac{1}{4}B \times B \rightarrow \frac{3}{8}A\frac{5}{8}B \times A \rightarrow \frac{11}{16}A\frac{5}{16}B \times B$ etc. The progeny stabilize at about $\frac{2}{3}$ of their sire's breed. Two separate herds are run, one of $\frac{2}{3}$ breed A cows and the other $\frac{2}{3}$ breed B cows, providing each other with heifer replacements.
2. A system of rotary crossing using three breeds in three herds — for example, Hereford, Brahman, Red Poll. The herds stabilize at $\frac{4}{7}$ of the breed of bulls used in the last generation and are mated to the breed that is least ($\frac{1}{7}$) in their breed make-up.

The dairy breeds are often used in crossbreeding systems to impart good milking ability to the crossbred mothers for prime weaner production.

Herd improvement

Commercial beef producers improve their cattle's productivity by selecting within their own herds and using superior animals, especially bulls, which are often purchased from breeders of registered purebred cattle.

Registered cattle comprise about eight per cent of the State's cattle population. They are the basic source of breeding stock for the commercial producer and their standard of productivity must be maintained and constantly improved. Registered breeders also pay much attention to the appearance of their cattle, but today the emphasis is moving more towards characteristics that are directly associated with production.

There is no recognized structure of parent and daughter studs (registered herds) as in the Merino sheep breed. Beef cattle studs merely differ in size and status. Breeding stock are exchanged between studs and passed on to commercial breeders.

Breed societies

Breed societies are organizations formed to promote and improve the standard of particular breeds. Membership is open to registered and commercial breeders. Cattle of acceptable standard may be registered with the societies. Systematic records are kept of the breeding or pedigree of registered animals. Records of the productive performance of cattle have also been kept for many years by individual breeders and breed societies, with the

object of breeding from the animals with the highest or most efficient productivity.

National Beef Recording Scheme

The past 10 years has seen the development of the National Beef Recording Scheme (NBRS). Breeders who join the scheme send liveweight data for their cattle at various ages to a central office in New South Wales. The information is processed by computer and the animals ranked according to their performance and that of their progeny. The information enables breeders to select the best bulls and females within their own herd and in other herds.

Performance records can also be used to establish production standards for a particular region and for approximate comparisons between breeds within the same environment and system of production. Breed societies are now working closely with the NBRS so that this type of standard can be set and superior animals within breeds identified on a national basis.

Beef cattle officers of the South Australian Department of Agriculture and Fisheries assist in the functioning of the NBRS at producer level. They provide information on the scheme to interested cattle breeders and, when required, assist in the submission of data and the interpretation of results. Some breeders prefer to record the performance of their cattle independently of the NBRS. They, too, are given help and encouragement which sometimes includes the use of departmental cattle weighing scales to initiate their programme.

It is well recognized throughout the industry that for beef to remain competitive and profitable to produce, the efficiency of

its productivity must be continually maintained and increased. Herd improvement by stud and commercial breeders ensures this in South Australia.

The breeds

Beef cattle breeds in South Australia fall into four main categories:

- British beef
- European
- Zebu
- British/Zebu crossbreeds.

The breeds within these types all have certain similar production characteristics, which are described in this section. These general characteristics should be referred to when reading the specific breed descriptions.

British beef breeds

Hereford, Poll Hereford, Beef Shorthorn, Poll Shorthorn, Angus, Murray Grey, Red Angus, Red Poll*

Maturity

British beef breeds are early maturing — they lay down fat and become sexually functional at an early age and light weight. With adequate nutrition, they are able to produce well-finished prime carcasses as weaners off their mothers at as young as eight months. Heifers can be ready for mating at 12 months provided they have reached a minimum recommended weight of 250 to 275 kg. Generally, however, heifers are not mated until 14 to 15 months of age.

*Red Poll is included here but it tends towards the dairy breeds in most characteristics, having originally been bred as a dual purpose breed.

Fertility

The good fertility of the British breeds is partly due to the tendency of lactating cows to reduce milk supply under adverse conditions. This enhances their ability to conceive the next calf and carry it through the gestation period.

Milking ability

Milking ability is usually moderate. When young cattle are reared to prime condition for slaughter as weaners, more emphasis is given to this trait in the selection of breeding stock.

Growth rates

Growth rates before weaning are generally moderate and much dependent on the mother's milk production. Post-weaning growth rates vary, depending largely on the mature size of the particular breed and the amount and quality of pasture. Good average growth rates for steers on spring to mid-summer pastures are 0.8 kg a day pre-weaning and 0.9 kg a day post-weaning.

Carcass conformation

Carcass conformation and meat quality is good. Fat is well distributed over the carcass and within the muscle.

Mature size

Mature size varies from small to moderate depending on breed and line within the breed. For example, good average liveweights for Angus and Hereford bulls is 770 kg and 900 kg respectively. For the same breeds, good slaughter weights for well-grown 18 month steers in prime condition are 420 kg and 500 kg respectively.

Adaptability

Outside the tropics and insect-infested areas British breed cattle adapt well to a wide range of climatic and nutritional conditions. In winter they have a warm woolly coat that is shed in summer for one that is shorter and smoother.

European breeds

Charolais, Simmental (Fleckvieh), Limousin and Chianina

Several European cattle breeds are making significant entries into the beef industry of countries outside Europe, including Australia. Although their number is not yet great in South Australia, their production characteristics have been evaluated to some extent by local research and experience. Together with information from elsewhere this enables a general description to be made. Note that in Australia the commercial use of European breeds is almost exclusively in crossbreeding, complementing their production characteristics with those of other cattle, especially the British breeds.

Maturity

To produce prime weaners the relatively late-maturing European breeds have to remain suckling the cow under good conditions of nutrition until at least 10 months of age. This means that as purebred cattle they are generally an uncertain proposition for weaner or yearling production and more likely to produce an adequately finished carcass if grown out to 18 to 24 months. Where the market requires lean beef, however, late maturity is an advantage.

Fertility

In general terms, fertility is average but varies between breeds. European breeds have gestation periods about four days longer than British breeds. Calf birth-weight is high and can lead to more frequent calving difficulty, especially when bulls are crossed with smaller breeds. In the past, indoor calving under the farmer's close attention has probably resulted in a low selection pressure against difficult calving. Under more extensive grazing conditions selection for ease of calving is greater and the problem of difficult calving steadily decreasing.

Milking ability

Some of the European breeds, such as the Simmental, have been kept for milk and meat in their countries of origin and therefore have a greater milk supply than breeds developed only for beef. Otherwise, milking ability is average for beef breeds.

Growth rates

Growth rates before weaning are high. In some breeds it is the result of good milking ability and in all breeds it is because of their inherent size. For the latter reason, post-weaning growth rates are very high under conditions of adequate nutrition. Good average growth rates for steers on spring to mid-summer pastures are 1.0 kg a day before weaning and 1.1 kg a day after weaning. These rates are usually associated with highly efficient conversion of food to carcass weight.

Carcass conformation

Carcass conformation is good with heavy muscle development being one of the most desirable attributes. Meat yield is high after bone and excess fat is

removed — about 70 per cent compared with 66 per cent for British breeds. Sometimes the meat is lower in quality, especially with regard to distribution of fat in the muscle, known as "marbling".

Mature size

European breeds are very large at maturity. The main advantage of large size is the lower cost of producing, slaughtering and butchering a given quantity of beef. If cattle are too large, however, they can be difficult to handle. There is also a limit to the desirable size of carcasses, except for very specialized markets.

Compared with most British breeds, European bulls are about 150 kg heavier and well-grown 18-month old steers about 90 kg heavier, although it depends on breed.

Adaptability

Some of the European breeds have not been outside Europe long enough to ascertain their adaptability but they appear to be capable of doing well in many different environments. This has been especially confirmed with Simmentals, which were the first European cattle to be introduced in large numbers to foreign environments.

Zebu breeds

Brahman

There are not many Zebu (or Zebu cross) cattle in South Australia, which lacks the tropical and subtropical environments for which Zebras are especially adapted. The Brahman, however, has found a place in crossbreeding programmes on many properties.

Maturity

Maturity is late, in respect of both sexual and carcass development. Brahmans need to be older and heavier for heifers to conceive or for sale stock to be in prime condition for slaughter.

Fertility

Fertility is low to average. The cows tend not to come into oestrus when suckling a calf under low nutritional conditions. This is a survival trait suited to harsh environments but not farming systems requiring high production.

The gestation period is long, yet calves are no larger than those of British breeds and calving difficulties are rare. Mothering ability is good with a strong protective instinct towards calves.

Milking ability

Milking ability is average to good depending on the breed.

Growth rates

Growth rates are lower than British and European breeds but this may be reversed under conditions of poor nutrition. Growth rates are greatly increased by crossing with British breeds in both the first cross and such stabilized crossbreeds as the Santa Gertrudis.

Carcass conformation

Carcass quality and conformation is average to low, but meat yield, free from fat and bone, is almost as high as that of European breeds.

Mature size

Mature size is between that of British and European breeds.

Adaptability

Zebu breeds have been bred to tolerate hot and usually humid conditions and show considerable tick resistance. In South Australia, however, only heat tolerance during summer has any relevance.

Zebu/British crossbreeds

Santa Gertrudis, Braford

Most characteristics of the Zebu/British crossbreeds are intermediate between the parent breeds. In the appropriate environment the crossbreeds have growth and reproduction rates superior to the average of the parent breeds. First-cross animals from Zebu and British parents have a large amount of hybrid vigour. This is particularly shown by their growth rate which can be appreciably higher than either of the parents.

Description of the breeds

These individual breed notes do not give a complete description on their own. Read them in conjunction with the general description of production characteristics for the appropriate group (pages 55 to 57).

Growth figures presented here are averages from NBRS records. They represent only a small sample — at present, about four per cent of registered herds in Australia are performance recording, and not all of them with the national scheme.

Availability varies depending on whether the breed is well-established or newly-introduced. In South Australia there are considerably more cattle of the Poll Hereford, Poll Shorthorn and Angus breeds than any of the others (see Table 2). Con-

sequently, there is a greater variety of genetic material (types and bloodlines) to choose from within these three breeds.

The availability figures given for some breeds are the estimated numbers that could be provided from the present beef cattle population during periods of stability and normal climatic conditions, and in the absence of disease control restrictions.

It should be realized that some of the registered breeders have small herds. This is especially so with the new breeds which are being bred up using imported semen — a popular practice on small farms near Adelaide.

Semen from purebred bulls of all the established breeds is available for export from South Australia. It will also be available from the new breeds as soon as they have purebred bulls of proven quality.





Mixed age Hereford cows in the Southern Adelaide Hills in early summer.

Herefords originated in the English county of Herefordshire which is low-lying, rich pastoral country on the border with Wales. Over the past three centuries Herefords have become the most widely distributed and popular breed of British beef cattle.

Characteristics

The Hereford (and the Poll Hereford) has the familiar colour pattern of white face, crestline and underside on a red-brown body. The intensity of brown skin pigmentation varies and it is advantageous for the skin around the eyes to be well pigmented to give greater resistance to eye cancer. It is considered that well-developed frontal bone growth over the eyes also increases protection from disease and foreign objects.

Rapid loss of the winter coat at the onset of summer is advantageous to the Hereford's value in the saleyard at that time of year. The attractive colour pattern is claimed to influence buyers as a reliable indicator of a quality carcass in both purebreds and crossbreds in which the white face is a dominant characteristic. Hereford carcasses usually have the white fat and bright-coloured meat favoured by consumers.

The Hereford's horns are white or cream-coloured and usually curve forward and slightly downward.



This fully mature Hereford bull is typical of the Australian type.

Purpose

Herefords are used in the same way as described for the Poll Hereford.

Adaptability

Since the Hereford's introduction to the vast new grazing lands of the North American West in the 19th century, the breed's adaptability has been widely recognized. Herefords do well under arid grazing conditions and in the feedlot. In South Australia they are grazed, like the Poll Herefords, under a wide range of intensive to extensive pastoral conditions.

Herefords have a special ability to come through dry summers in good, sometimes even fat, condition. In the cows, this is partly

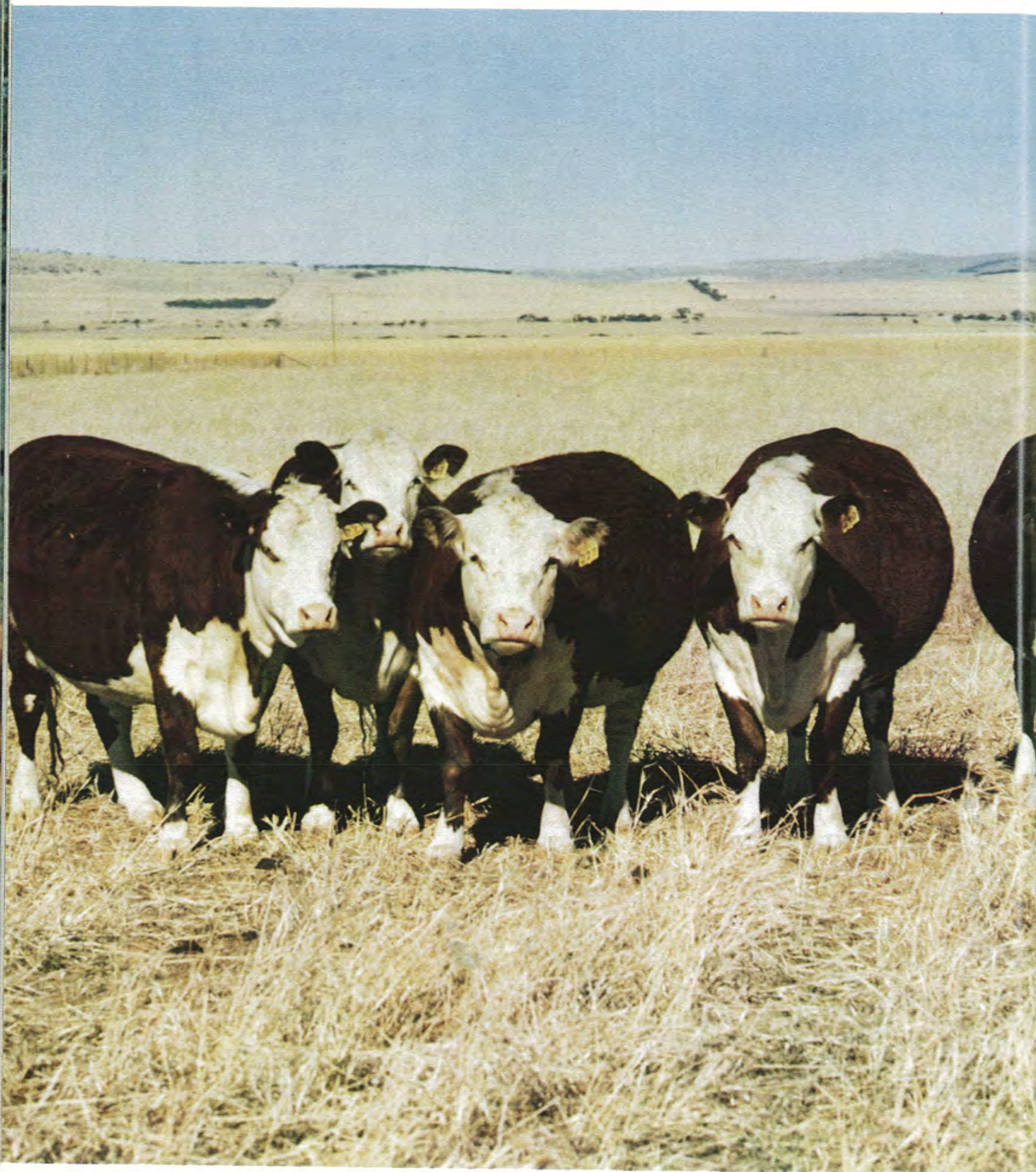
because they have an adequate but not excessive milk supply. The supply can be regulated by selective breeding to be as high or low as required to suit the environment and production system.

Availability

The number of Herefords in South Australia is considerably lower than their close relative, the Poll Hereford. South Australian cattlemen have opted for one less management operation. In neighbouring Victoria, New South Wales and Queensland the situation is reversed.

South Australia has about 30 registered Hereford breeders, mostly in the Lower South-East.

Hereford



A group of 2½-year-old Poll Hereford heifers in the cereal zone in early summer. They will calve for the first time at three years old — a practice preferred by many stud breeders.

Poll Hereford breeding began in the USA about the turn of the century. The breed has since achieved world-wide popularity, the absence of horns adding to the attributes of its progenitor, the Hereford. The Australian Poll Hereford Society was formed in 1933 and now has more members and more cattle registered annually than any other breed society in Australia.

Characteristics

Poll Herefords are similar to Herefords in appearance except for the absence of horns. NBRIS records show that heifers in the cereal zone weigh about 180 kg at 200 days and 170 kg at the same age in the high rainfall zone. Their weights at 420 days (pre-mating age) average 290 kg and 258 kg respectively.

Purpose

Because of their early maturity, Poll Herefords (and Herefords) in South Australia are used primarily for producing young slaughter stock of weaner to yearling age. This requires a good milk supply from the cow for rapid pre-weaning growth. For more arid environments where nutritional conditions allow the turnoff of older animals only, the cow provides less but sufficient milk for her calf while maintaining her condition through periods of feed scarcity.

The Poll Hereford is often used in crossbreeding systems. The cows are used as base females to produce half-bred progeny. A popular cross is the Friesian/Hereford, the females of which are mated back to a Poll Hereford or other beef breed bull to produce calves for the prime weaner or yearling market.



A fully mature Poll Hereford bull.

Adaptability

The Poll Hereford is as adaptable as the Hereford.

South Australia, with Poll Herefords spread throughout its diverse environments, is an excellent market for the purchaser of breeding cattle. Poll Herefords have been sold to all other mainland Australian States, New Zealand and North America.

Availability

The Poll Hereford is one of the three most numerous breeds in South Australia and the State has stock as good as can be found anywhere. During the past 10 years the top Poll Hereford bulls at the Sydney Royal Easter Show have been bought by South Australian stud breeders. South Australia has 135 registered Poll Hereford breeders.

Estimated numbers that could normally be available for export annually:

| | Bulls | Females |
|------------|-------|---------|
| Registered | 2 000 | 400 |
| Commercial | 3 500 | 4 500 |

The Poll Hereford Society was the first breed society in Australia to adopt a system of stock inspection at its sponsored shows and sales of registered cattle. Inspections are carried out by experienced breeders nominated by the society. Breeding records are checked back for six generations and each animal must meet a set standard or otherwise be rejected. The society guarantees genetic purity and cows are guaranteed in calf.

Poll Hereford



Shorthorn and Poll Shorthorn bulls in the cereal zone. At 1½ to 2 years old they are soon due for their first mating season.

Beef Shorthorns, one of the oldest British breeds, predominated in the first shipments of cattle to Australia in the early 1800s. They adapted especially well to extensive inland pastoral regions where they are still the dominant breed. The Poll Shorthorn originated as a hornless version of the Beef Shorthorn, the polled characteristic being the only obvious difference between the two.

Poll Shorthorns have been bred in Australia for over 100 years. A separate Poll Shorthorn Society of Australia was formed in 1935. Influenced by importations from Britain and the USA until 1956, Australia has developed a useful choice of different types or bloodlines.

Characteristics

Poll Shorthorn types differ mainly in size and age at maturity. Of the several types of Beef Shorthorn, the large, long-legged rangy type of the pastoral zone is most numerous.

Colour in the two breeds is allowed considerable latitude and does not hinder selection for other characteristics. Coat colour is red, roan, or white with deeper reds being favoured in the hot northern regions. The reds and roans have red pigment in the skin and the whites have a yellowish hide.

NBRS records show that the average Shorthorn heifer (Beef and Poll) in the cereal zone weighs 290 kg at 420 days (pre-mating age) and bulls average 515 kg at 18 months. At 200

days they average 185 kg and 214 kg respectively. In the higher rainfall zone, where they are generally a small type, weights at 200 days are about 10 kg lower.

Purpose

Many Poll Shorthorn breeders, especially in the cereal zone, aim at a medium to large-framed animal for the two-year-old steer trade. Smaller, early maturing types more common to the high rainfall zone are better suited for marketing as prime weaners or yearlings.

Shorthorns in the pastoral zone are normally sold as mature bullocks for the export manufacturing market. In good seasons, many of them finish in excellent condition at 18 to 30 months and sell well to the domestic trade in spite of long journeys to the cities.

Shorthorns are versatile animals for crossbreeding. The benefits of hybrid vigour can be obtained to a large extent by crossing between types and between breeds of the Shorthorn group — Beef Shorthorn, Poll Shorthorn, Dairy Shorthorn and others. Shorthorn breeders have access to a large pool of genetic material without having to utilize the attributes of completely different breeds. Thus the herd's Shorthorn character is maintained and there is minimal disruption to the registration of purebred cattle.

As is normal with other breeds, the polled factor is dominant and usually expressed in the calves of Poll Shorthorns even if the other parent is of a horned breed.

Adaptability

Most Beef Shorthorns in South Australia are in commercial herds in the North, where they are well adapted. Many of the attributes of the Shorthorn and Poll Shorthorn in other regions of Australia are derived from their hardy inland relatives. To survive in the pastoral zone cattle must do well with an absolute minimum of management, cope with food shortages and high temperatures and calve easily. The Beef Shorthorn apparently uses its horns to break down branches from edible trees.

Poll Shorthorns are more common to the cereal and high rainfall zones where they are widely distributed and well adapted to high temperatures and dry forage utilization during summer. They calve easily and rear their calves on an ample supply of milk.

Poll Shorthorns have been exported to North America, Britain, New Zealand and South Africa. The types bred for South Australian conditions are likely to do equally well overseas, especially in countries requiring relative hardiness and ease of management. When beef cattle were introduced to the Australian Demonstration Farm in Libya, the chosen animals were Poll Shorthorns from South Australia.

Availability

South Australia has 180 registered Poll Shorthorn breeders, more than of any other breed and second in number only to New

Shorthorn and Poll Shorthorn



South Wales. There are 23 registered breeders of Beef Shorthorns in South Australia.

One parent of a registered Poll Shorthorn may be a registered Beef or Dairy Shorthorn. It is therefore advisable to check pedigree to determine the probability of polled offspring. At sales sponsored by the Poll Shorthorn Society the cattle are inspected to ensure that they meet a high standard.

Estimated numbers that could normally be available for export annually:

| | Registered | |
|----------------|------------|---------|
| | Bulls | Females |
| Shorthorn | 350 | 90 |
| Poll Shorthorn | 1 000 | 250 |
| | Commercial | |
| | Bulls | Females |
| Shorthorn | 650 | 1 200 |
| Poll Shorthorn | 1 700 | 3 400 |

Poll Shorthorn heifers, 2 to 2½ years old, running with a young Poll Shorthorn bull in the cereal zone during winter.



In spite of a year of severe drought, these commercial Poll Shorthorn cows were still able to raise their calves successfully.

The Angus breed was developed over several centuries from cattle of the steep hill country in north-eastern Scotland. Then known as the Aberdeen-Angus, the breed was introduced into Australia in 1840.

Angus have become world renowned as producers of choice table beef and are currently enjoying a surge in popularity in Australia.

Characteristics

The Angus is a naturally and dominantly polled breed, all black in colour. It has a relatively small head, refined and slightly dished in the muzzle.

Growth rate figures for Angus cattle throughout Australia are currently being released by the NBRIS. On the higher rainfall coastal areas, such as the South-East of South Australia, the average weight of 420-day (pre-mating) heifers is 255 kg. In areas like the cereal zone and Adelaide Hills, Angus cattle are somewhat larger, with heifers weighing about 280 kg at 420 days. At only 200 days of age, however, the South-East cattle are heavier (190 kg) than hills and cereal zone cattle (170 kg). This reflects the faster growing of weaners for heavier and later turn-off in the South-East's higher rainfall, longer-growing season. This variation in size and type of Angus to suit conditions is characteristic of the breed in Australia.

Purpose

Angus cattle are usually used to produce well-muscled, well-finished prime weaners at 8 to 11 months of age, depending on



At 2½ years old in August, this Angus bull has just completed his first mating season.

nutritional conditions. They are efficient converters of pasture to meat, and prime weaner production gives a high return per hectare especially in the higher rainfall hill country and the temperate conditions of the South-East.

The Angus breed is frequently used in crossbreeding systems. For example, the cows are suitable as the base herd in a terminal sire system and Angus bulls impart excellent carcass qualities to their progeny. The smaller size and easy calving attributes of Angus are often utilized by mating Angus bulls to heifers or young cows of other breeds.

Adaptability

Angus cattle have traditionally been run in good pasture high rainfall country. It is becoming apparent, however, that they are

adaptable to a wider range of environmental conditions than previously thought. In recent years they have been introduced to South Australia's northern pastoral zone with some success.

Availability

The Angus Breed Society in South Australia has more members, stud and commercial, than any other similar society in the State. South Australia has 90 registered breeders of Angus cattle, mostly in the South-East and the Adelaide Hills.

Estimated numbers that could normally be available for export annually:

| | Bulls | Females |
|------------|-------|---------|
| Registered | 1 100 | 300 |
| Commercial | 2 100 | 3 000 |

Angus



A breeding herd of Angus cattle in the Adelaide Hills.

Murray Grey was the first new beef breed to be evolved in Australia. It originated from an Angus x light-roan Shorthorn cross. The first of 12 grey calves from the resulting crossbred cow were born in 1905 and after many years of commercial development the breed was firmly established with the formation of the Murray Grey Beef Cattle Society in 1962.

Characteristics

Murray Grey cattle are silver-grey, grey, or dark grey with a conformation characteristic of the popular British breeds. The incidence of the various colours depends on the colour of the parents. The skin, muzzle and hooves have dark pigmentation. The breed is naturally polled.

Purpose

The Murray Grey produces well-fleshed, well-finished carcasses as weaners at 9 to 10 months of age or as 1½ to 2 year-olds. Their reputation as producers of quality carcasses has been furthered by their many successes in beef carcass competitions throughout Australia. Because of the maternal qualities of the cows and the size and muscling of the bulls, the breed is widely used in cross-breeding programmes.

Adaptability

Murray Greys do best in the type of country for which they were bred — the relatively productive pasture land of the upper Murray Valley of Victoria and New South Wales. They have also proved



A two-year-old Murray Grey bull in good working condition.

themselves in cold sub-alpine areas and have been introduced into semi-arid regions. In South Australia, they are run mainly in the high rainfall zone.

They are gaining rapidly in popularity throughout Australia and in New Zealand, North America and Britain. Semen and live cattle have also been sent to China.

Availability

South Australia has 86 registered Murray Grey herds, widely distributed but mostly situated in the South-East and Adelaide Hills. Under normal seasonal and industry conditions, availability for export is good.

Approved Angus or commercial Murray Grey cows are used as base females for breeding up to purebred registered Murray Grey. After three generations — three crosses to pure Murray Grey bulls — the female progeny are registered as "A" class (purebred) Murray Greys. A fourth cross, of the "A" class cows to a pure Murray Grey bull, is required for male progeny to be registered as class "A".

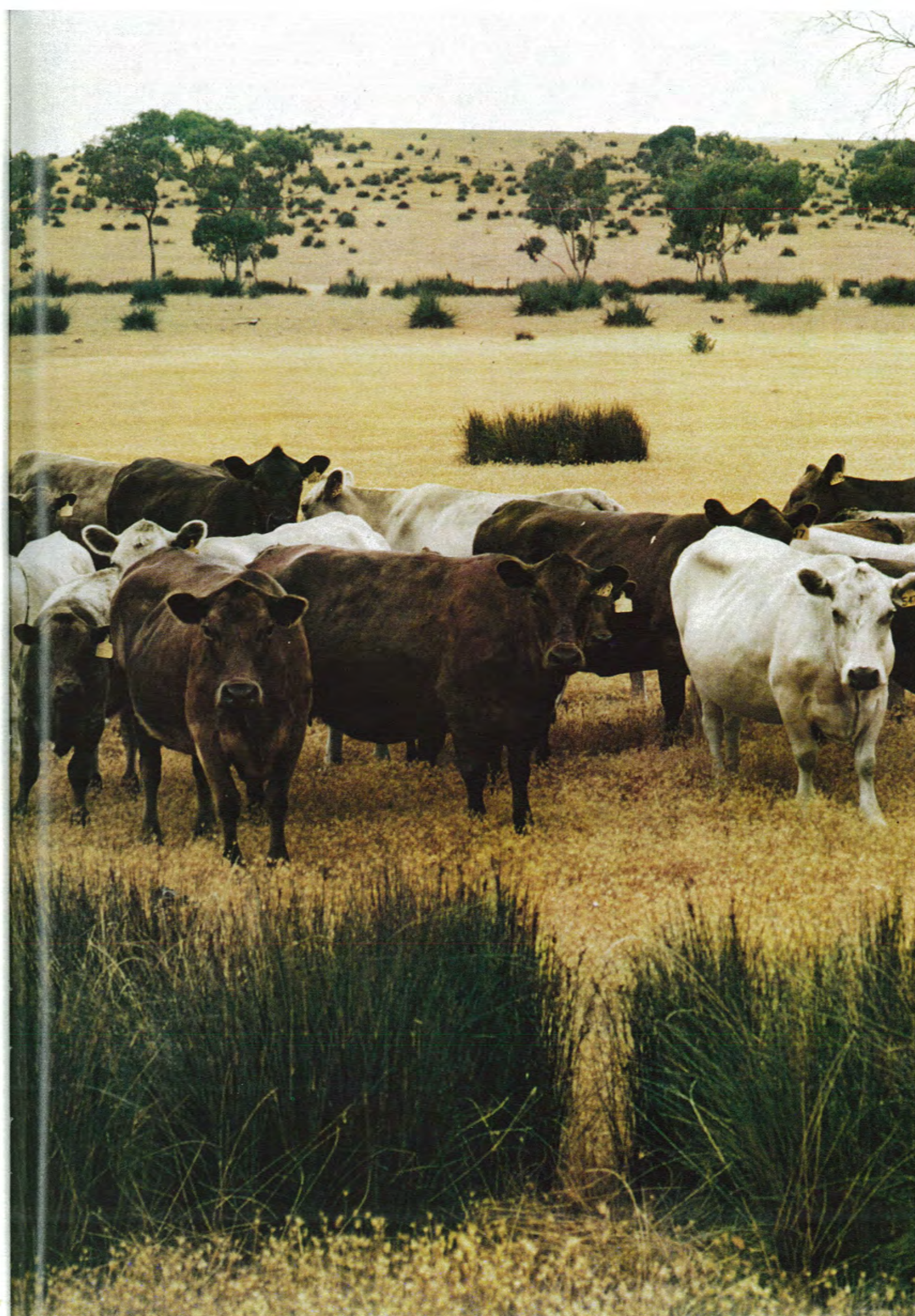
All cattle, be they purebred or at any stage in the breeding up process, are subject to inspection and approval by the society's full-time official inspectors before acceptance in the society's herd book.

Murray Grey



The excellent condition of these Murray Grey heifers will lead to high fertility.

(Right) Three-year-old Murray Grey cows in South Australia's South-East in summer.





Mixed age Red Poll cows with their calves in the cereal zone.

The Red Poll is a dual purpose breed developed in the east of England to produce meat and milk. It has in some measure both dairy and beef production qualities.

The breed is red, preferably deep red, often with a white tail switch. It is always polled.

A Red Poll cow gives the impression of a well-flesh dairy animal. Her average annual production on good quality pastures should be 3 200 to 3 600 litres of milk (3.5 to 4.0 per cent butterfat) and a yearling beef calf weighing 320 to 360 kg.

Purpose

Red Polls in South Australia were first used as dairy cattle but they have been increasingly developed as beef producers with a growing reputation for high-yielding, well-muscled carcasses.

They are best suited to prime weaner production to make the most of the cow's good milk supply. The breed is a useful one for both the large producer and the small herd owner who wants to milk a few cows as well as produce beef. The Red Poll also has a useful role in crossbreeding, enhancing the milk supply.

In South Australia, Red Polls are most popular in parts of the cereal zone, notably Yorke Peninsula, where they perform well. They are spread throughout the State, but it is usually better not to keep them in areas prone to extended feed shortages because milk production continues at the expense of body condition which may affect fertility and survival.



A Red Poll bull at 5½ years old.

Availability

South Australia has 74 registered Red Poll breeders.

Estimated numbers that could normally be available for export annually:

| | Bulls | Females |
|------------|-------|---------|
| Registered | 230 | 300 |
| Commercial | 420 | 600 |

Red Poll



Red Angus cows at 3½ years old nursing their second calves in the cereal zone.

Red animals have occurred from time to time in herds of black Angus since the earliest days of Angus breeding. Their selection and breeding in Australia led to the formation of the Red Angus Beef Cattle Society of Australia in 1969.

The breed is similar to the Angus but red-brown. In South Australia, breeders seem to be selecting for size so the Red Angus here is perhaps slightly larger than the average Angus.

Red Angus have the same useful qualities as the Angus, but it appears that some South Australian bloodlines may be suited to the production of somewhat older weaners in areas of lower rainfall. Being polled, red and a quality carcass breed, the Red Angus has been successfully used in crossbreeding, particularly in northern Australia.

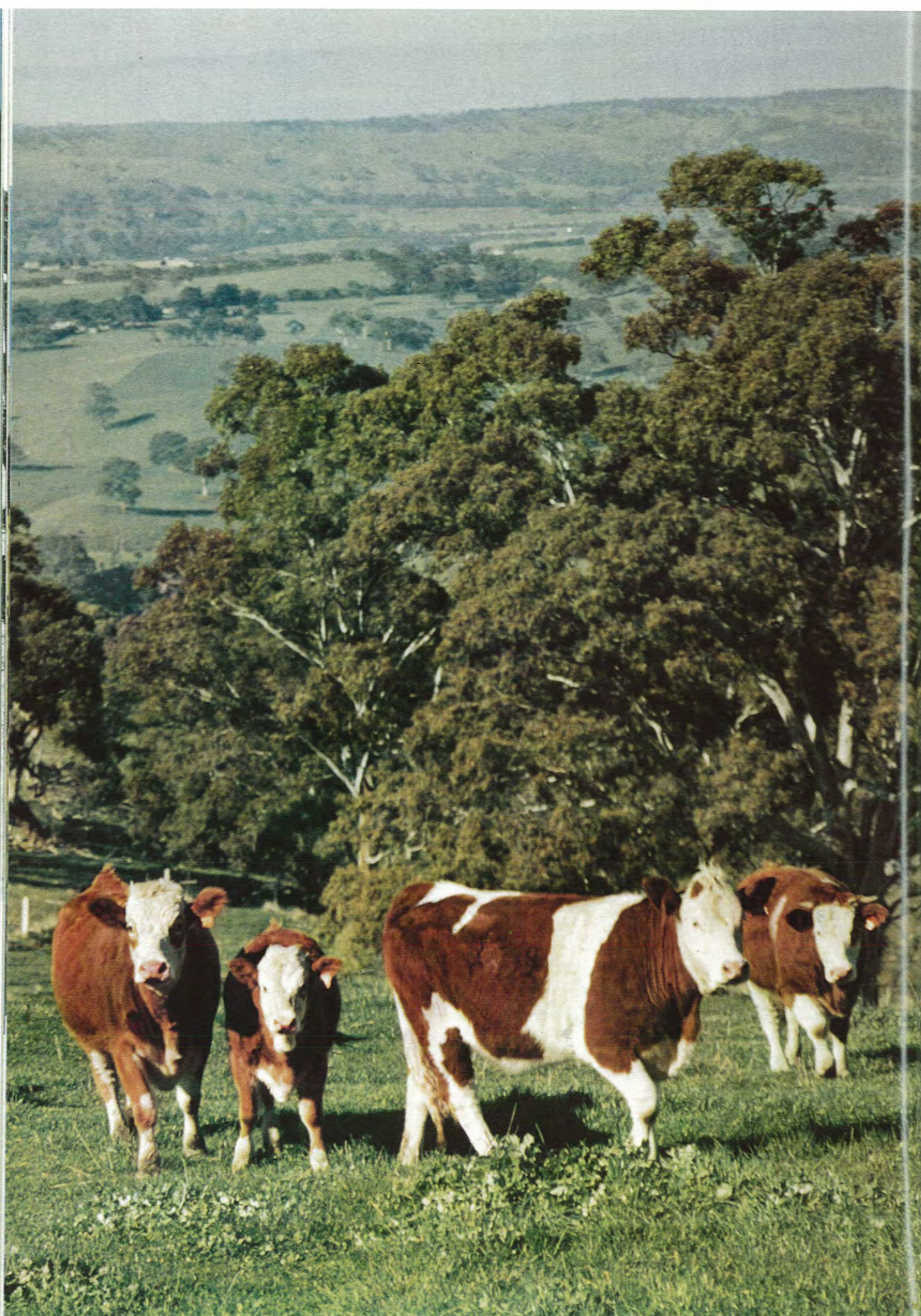
Red Angus cattle can be found in all three of South Australia's farming zones. Their red coats should give them better tolerance of high temperatures and solar radiation than the black Angus. They are adapting well to the pastoral zone. Red Angus have been exported to New Guinea, Noumea and the New Hebrides to improve indigenous cattle by crossbreeding.



A six-year-old Red Angus bull.

South Australia has eight registered Red Angus breeders. Breed numbers are increasing and, with the help of the NBRS and compulsory inspection of all cattle before registration, the breed is being vigorously improved.

Red Angus



The Simmental is a widely distributed European breed that originated during the Middle Ages in the alpine valleys of Switzerland. Its popularity in Europe has spread to other countries, where it has shown a high degree of adaption. It is now steadily being accepted as a favoured breed in Australia, the first semen having arrived in 1972.

Simmental cattle vary in colour from yellowish brown to dark-red, combined with white markings. The head is white, as are the underside of the breast and belly, the legs and tail switch.

Simmentals are large, muscular cattle. Mature bulls reach a good average weight of 1 100 kg and cows 750 kg. On good grazing, steers will grow to 600 kg in 18 months.

In Europe, the Simmental has been used as a triple purpose breed — for meat, milk and work. In Australia, they are being developed for beef production.

When numbers of the breed increase, Simmentals may be used as purebred commercial beef producers. Indications are that on good pastures it may be possible to market young animals as prime weaners, but if fat cover



A purebred Simmental bull weighing 955 kg at 21 months. He was bred in Australia by breeding up from another breed.

is lacking they will continue at a relatively high growth rate to market at 18 to 20 months.

The most useful commercial role for the Simmental in Australia is in crossbreeding, utilizing both its milk and meat qualities. The high productivity of the cross-breds has already been demonstrated in South Australia. NBRS records show that half-bred steers average 239 kg at 200 days.

South Australia now has 68 registered Simmental breeders situated mainly in the South-East and the Central District around Adelaide. The first 7/8 Simmental calves in South Australia (third generation of up-grading to pure Simmental semen) were born in autumn 1977.

Young three-quarter bred Simmental females, with a 7/8 Simmental calf. Photographed in the Southern Adelaide Hills in spring.

Simmental

Charolais was the first European beef breed to make an effective entry into the British beef industry. The import of Charolais semen into Australia soon followed from 1969 onward. The breed was originally developed in central France during the 16th century.

The Charolais is a very large, well-muscled beef breed. The coat is white or a light straw colour.

Charolais bulls commonly weigh up to 1 200 kg, cows to 800 kg and 18-month-olds to 600 kg. The main reasons for their increase in popularity as beef producers are their size and high yield of saleable meat free from bone and excess fat. They are relatively docile cattle and easy to handle.

In areas where nutritional conditions are good, Charolais can be run as highly productive commercial beef herds, normally being grown out to 18 to 24 months because of their later maturity. This develops an adequate fat cover and takes advantage of their potential for high and efficient post-weaning growth.



A well-muscled four-year-old purebred Charolais bull.

In South Australia, Charolais bulls are frequently used as terminal sires in three-breed cross-breeding programmes. The half-Charolais progeny, reared by high milk-yielding dairy/beef half-bred cows, grow into large, well-muscled weaners at 9 to 10 months, which are usually sufficiently finished for marketing

at that time. The half-bred cows should be large-framed animals to minimize the risk of calving difficulties.

South Australia has 96 registered Charolais breeders. They are mainly in the high rainfall zone, many being small breeders in the Hills districts around Adelaide.

Three-year-old Charolais cows with their calves at 4½ months in the well-pastured Adelaide Hills.

Charolais

The Limousin is a French beef breed that was introduced into Australia by semen imports in 1973. It is light-brown, horned and heavily muscled. The carcass produces a very high yield of lean meat relative to fat and bone.

In the future, Limousin cattle may be grazed as purebred commercial herds in the more temperate, better-pastured areas of South Australia. Limousin crossbreds are currently showing promise as producers of adequately finished carcasses for the local trade at 9 to 11 months of age.

Because the Limousin's birth-weight (and mature size) is smaller than other European breeds, there may be less calving difficulties when Limousin bulls are mated to heifers and young cows of the British breeds.

South Australia has about 15 registered Limousin breeders, mostly in the South-East. They are breeding up from base cows of the Shorthorn, Angus and Hereford breeds. By the end of 1979, South Australia will be well placed to meet export requirements of 7/8 Limousin performance-tested males and

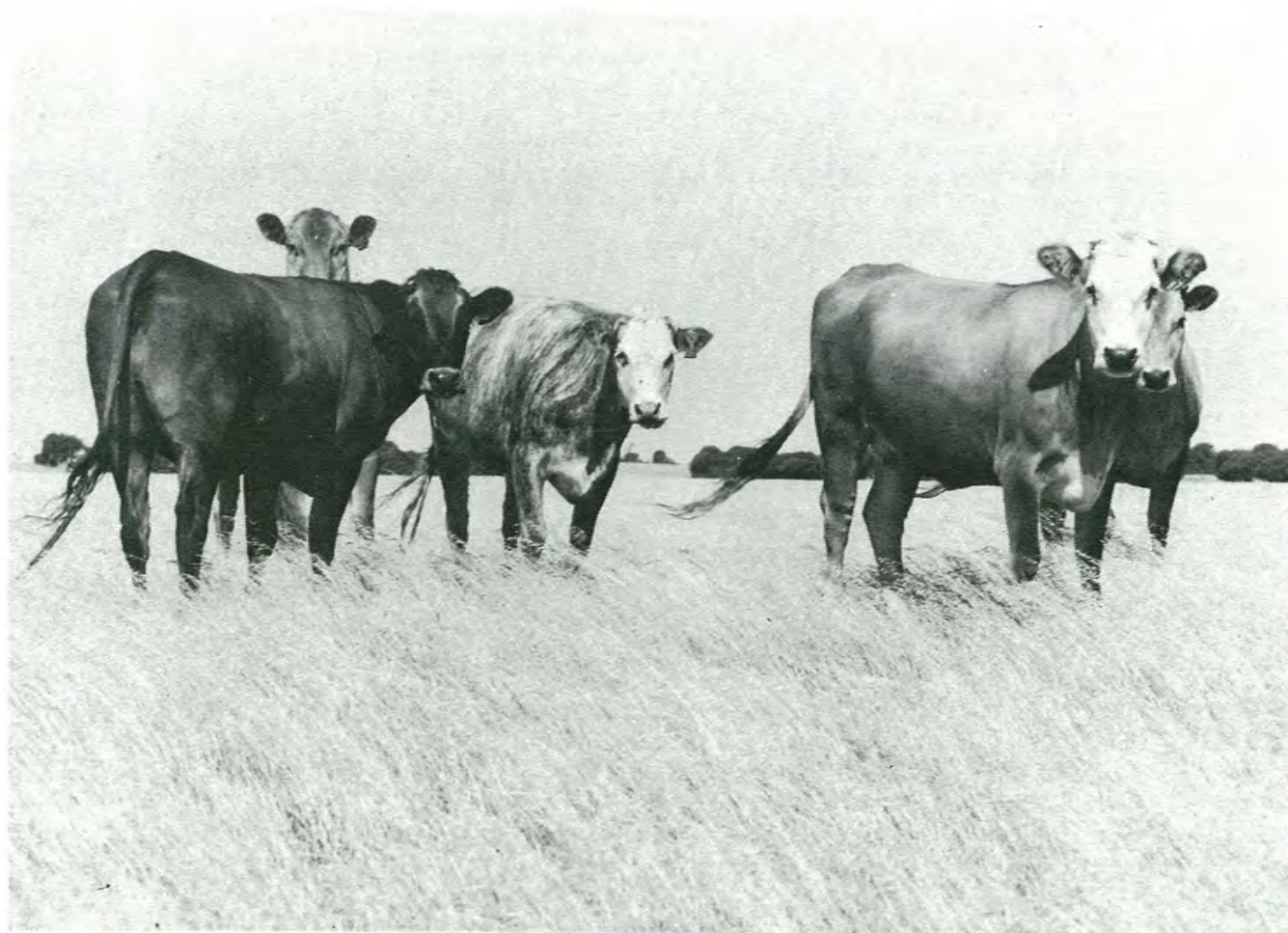


A two-year-old Limousin bull, showing the breed's characteristic muscle development. He was imported from New Zealand, the only country from which Australia can import livestock.

females. The numbers available will be quite large — there are 1 000 females being upgraded on one property in the South-East. This is the centre of Australia's largest Limousin breeding programme, which is being conducted in close co-operation with Limousin breeders in France and Britain.

Three-quarter bred two-year-old Limousin heifers in calf in South Australia's South-East. They were bred up from Angus and Shorthorn foundation cows.

Limousin



Two to three-year-old Chianina x Shorthorn and Chianina x Hereford half-bred females.

Chianina, a long-established Italian breed, is the world's largest breed of cattle. The first Chianina semen was imported into Australia in 1973.

Mature bulls can weigh up to 1 800 kg and cows up to 1 100 kg, although more normal weights are 1 500 kg and 700 kg respectively. The breed is white except for the black tail switch and the black nose and skin round the eyes. Chianinas are muscular animals with heavy necks, shallow bodies and long legs.

Chianina cattle will not generally be suitable as purebreds for the production of young slaughter cattle for the South Australian local market. The milk supply of the cows is depleted relatively early and the weaned calf only starts to lay down fat over the carcass at about 15 months of age. If Chianina were to be kept as purebred commercial beef herds, a minimum slaughter age of 1½ years should be anticipated, unless a lean carcass is preferred.

In South Australia, Chianina will probably be used mostly for crossbreeding to impart size and growth rate to the progeny. In spite of the breed's size, there are apparently few calving problems because of the fine head and long narrow body of the calves.

South Australia has about 12 cattle breeders who are breeding up to Chianina. The first ¾-bred calves were born in 1976 and purebred females (7/8) will be born in 1979.

Chianina

The Brahman was developed in the USA from several breeds of Zebu cattle from India. They were first imported into Australia in 1933 by graziers in North Queensland who sought tick-resistant cattle for their tropical environment.

Brahmans show characteristics typical of *Bos indicus* cattle. They are above-average beef producers in tropical and sub-tropical regions that have high temperatures and humidity for much of the year and a cattle tick problem. In more temperate areas the purebreds are not likely to compare favourably with British and European (*Bos taurus*) breeds.

South Australia, with no tropical environment, has about 15 registered breeders of Brahman cattle whose main function is to provide bulls for crossbreeding purposes. Cows that are part Brahman and part *Bos taurus* could be expected to perform better during the hot summer months. A maximum amount of hybrid vigour can be obtained by crossing Brahman with British or European breeds. This can significantly increase growth rates.

South Australia's 15 registered breeders could normally have about 100 stud cattle available for export annually. Of much greater significance would be the supply of Brahman crossbreds, which are well adapted to commercial beef production in tropical and warm, dry climates overseas.

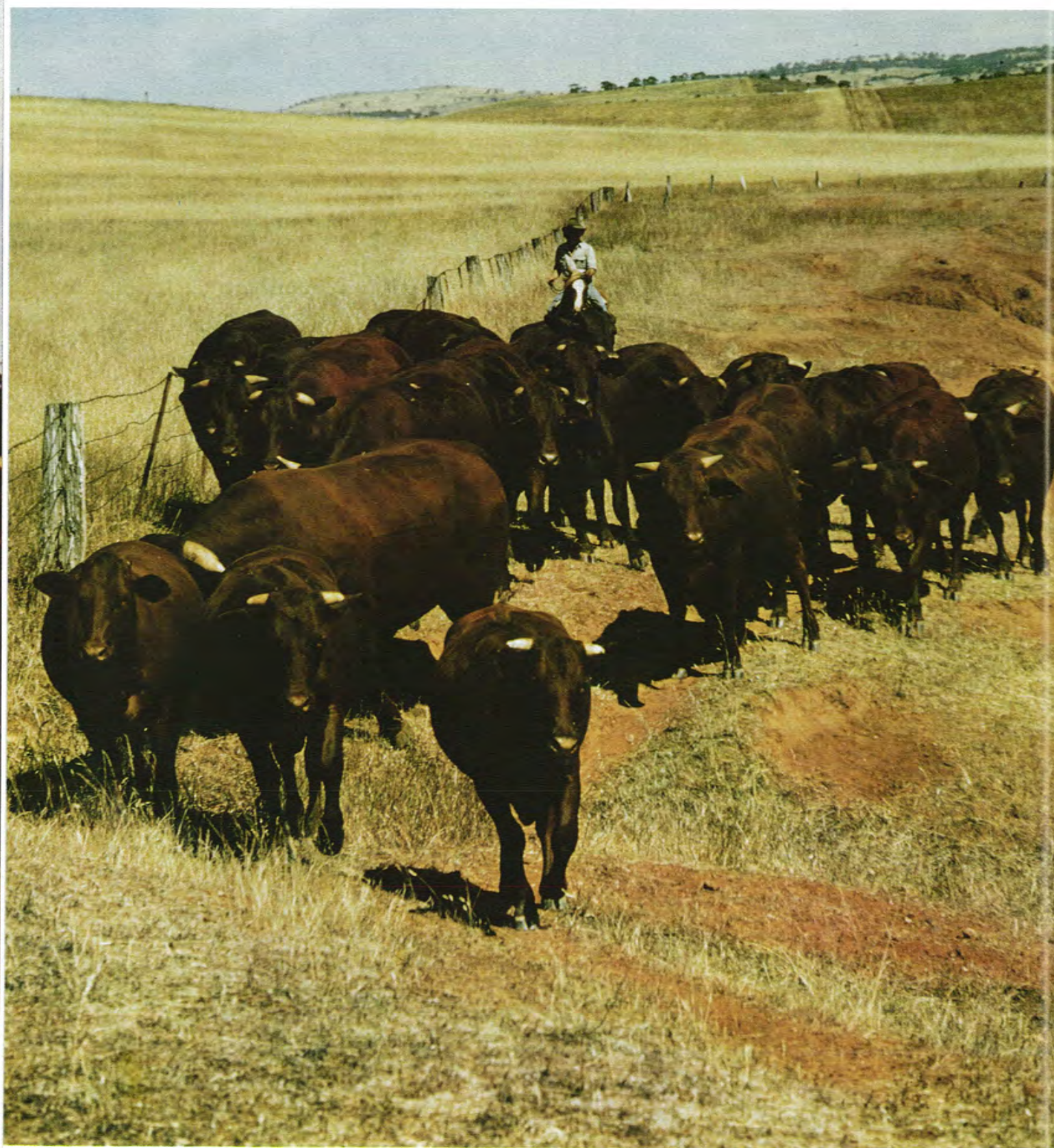


A mature Brahman bull.



A stud Brahman cow with calves.

Brahman



Two-year-old Santa Gertrudis heifers in the cereal zone in summer, expecting their first calves in autumn.

*The Santa Gertrudis is the most established and widespread of the numerous breeds that have been developed to combine the hardiness of *Bos indicus* cattle with the productivity of *Bos taurus* cattle. They originated in Texas, USA, between 1920 and 1940 as a stabilized cross with about 3/8 Brahman and 5/8 Shorthorn blood. The breed was introduced into Australia in 1952 and has since had an impact on beef production in all Australian States, but particularly in the tropical and sub-tropical North.*

In body conformation and features, the Santa Gertrudis is intermediate between its two parent breeds. It is as large as the Brahman, plain reddish brown with a short, smooth coat.

The Santa Gertrudis does well in most regions of Australia, but is at its greatest advantage in the tropics and sub-tropics where its inherent tick resistance is of value. In South Australia, it has most application in the drier, hotter areas, especially in the north of the State. It is a desirable breed to run in the cereal zone because of its ability to utilize the dry stubbles after harvesting. It also performs well in areas of better pasture.



A four-year-old Santa Gertrudis bull.

Because of fairly late maturity, the Santa Gertrudis is better suited to the production of two-year-old beef, although progress has been made in some South Australian herds towards a type that will finish in adequate condition as yearlings.

The Santa Gertrudis has a useful role in crossbreeding, transmitting its ability to adapt to less favourable climatic and nutritional conditions. Hybrid vigour

enhances the growth of the progeny whether the other parent is of Zebu or British type. In South Australia, Santa Gertrudis cows are usually crossed to a British breed bull to give earlier maturing calves for the yearling market.

South Australia has six registered breeders of Santa Gertrudis, two of them within 100 km of Adelaide. Normally, about 1 000 registered and commercial cattle could be available annually for export.

Santa Gertrudis

The Braford is a Brahman/Hereford cross developed in Queensland during the 1950s and 1960s. In South Australia, the proportion of Brahman blood is normally about 3/8.

Like the Santa Gertrudis, the Braford has characteristics that are intermediate between its two parent breeds. The breed is progressing towards being entirely polled.

The adaptability of the Braford is much the same as for the Santa Gertrudis and its use in South Australia is similar. Breeders say that when grazed on lush pastures, particularly dryland lucerne, Brafords show a greater resistance to bloat than the pure *Bos taurus* breeds because of their habit of spreading their grazing over longer periods.

South Australia has 12 registered Braford breeders who have already made sales overseas — in fact South Australia exported the first Australian Brafords to New Zealand and China. A total of about 400 registered and commercial Brafords could normally be exported annually.



A two-year-old Braford bull.



Braford cows and their calves in South Australia's South-East.

Crossbreeding



Crossbreeding is a popular practice with commercial beef producers in South Australia. This herd, yarded for castrating and ear-marking the calves, is comprised of both beef and dairy breed types and their crosses.



These three breeds of bulls — Poll Shorthorn, Friesian and Charolais — are used in a terminal sire crossbreeding programme in the Adelaide Hills.



These half-bred cows, and their calves sired by a Poll Hereford bull, are part of an experimental project carried out by the South Australian Department of Agriculture and Fisheries. Growth of calves from dairy/beef crossbred cows was especially high.

Braford

Directory

GENERAL ENQUIRIES FOR AVAILABILITY OF LIVESTOCK

The Executive Officer,
EXSAB,
The South Australian Department
of Agriculture and Fisheries,
G.P.O. Box 1671, Adelaide,
South Australia 5001
Telephone: (08) 227 3141
Telegrams: Agrisouth, Adelaide
Telex: 88422

SOUTH AUSTRALIAN DEPARTMENT OF AGRICULTURE AND FISHERIES

G.P.O. Box 1671, Adelaide,
South Australia 5001.
Telex: 88422
Telegrams: Agrisouth, Adelaide
Telephone: (08) 227 3000

Agriculture and Fisheries is a department of the South Australian Government. It conducts research into all aspects of South Australian agriculture and provides an extension advisory service to the State's farming community. The department maintains advisers in most country towns and has research centres in most of the State's regions.

Specialist advice is provided in all areas of animal production, including disease prevention and control, breeding and grazing management, and feeding. Services are provided in product handling, such as wool clip preparation, and in certain aspects of marketing.

Scientists and technicians experienced in the integration of livestock with the dryland farming system are available from the department for consultancy in overseas countries. They are also available for contract research into special overseas problems related to dryland farming in Mediterranean climates.

The department can arrange training in dryland farming technology for overseas personnel.

THE SOUTH AUSTRALIAN DEPARTMENT OF ECONOMIC DEVELOPMENT

Trade and Development Division,
G.P.O. Box 1264, Adelaide,
South Australia 5001
Telex: 82827
Telephone: (08) 212 5562

For assistance or advice on any matter relating to trade or industry in South Australia, please contact the Department of Economic Development. The department exists to promote the industrial and commercial development of South Australia and to provide liaison between government and industry.

It particularly seeks to help interstate and overseas firms considering establishment in the State.

The department has the responsibility for investigating potential new South Australian industries and products.

The department also maintains substantial listings of manufacture-under-licence or joint-venture proposals that can be undertaken in South Australia or overseas.

The Department of Economic Development is actively involved in promoting the transfer of technology to overseas countries either through the public sector or in joint venture with South Australian consulting companies.

Departmental officers are experienced and qualified in a wide variety of fields, including marketing, engineering, research, economics, statistics, tariffs, transport, publicity, trade and commerce.

The department also has Trade Representatives in Sydney, Melbourne and several overseas countries, including the Agent General for South Australia in London. Their locations are:

SYDNEY

Mr. Denis P. Martin,
South Australian Govt. Trade
Representative,
G.P.O. Box 1205,
SYDNEY, New South Wales,
Australia 2001.

MELBOURNE

Mr. Roger S.D. Clark,
South Australian Govt. Trade
Representative,
25 Elizabeth Street,
MELBOURNE, Victoria,
Australia 3000.

BRITAIN AND THE CONTINENT

The Agent General, although based in London, has contacts all over Britain and the Continent. All enquiries should be addressed:

Mr. W.M. Scriven,
Agent General for South
Australia,
South Australia House,
50 Strand,
LONDON WC2N 5LW,
England.

HONG KONG

Mr. M. Moore,
Manager,
Elders Hong Kong Limited,
3716-3718 Connaught Centre,
1 Connaught Place,
HONG KONG.

JAPAN

Mr. P.E. Day,
Manager,
Elders Japan Pty. Ltd.,
Dai-Ni Toranomon Denki
Building,
3, Tomoe-cho,
Shiba Nishikubo,
Minato-ku,
TOKYO 105,
Japan.

SINGAPORE

Mr. Tay Joo Soon,
Managing Director,
Asiaco (Pte) Ltd.,
1202/1203 12th Floor,
High Street Centre,
North Bridge Road,
SINGAPORE 6.

THE POLWARTH SHEEP BREEDERS' ASSOC. OF AUSTRALIA

SA Branch,
R.A.H.S. showgrounds,
Wayville,
South Australia 5034.

The Polwarth is the "ideal" breed of sheep — a true comeback. A dual purpose sheep, it produces high quality 22 to 25 micron wool, with heavy cuts of wool per head. It also produces top quality lambs and lean carcass meat. The Polwarth is a highly fertile, "easy-care" sheep.

Polwarths are ideal for upgrading or crossing with other breeds and they thrive under a wide range of rainfall and climatic conditions.

THE AUSTRALIAN JERSEY HERD SOCIETY

South Australian Branch,
Showground,
Wayville,
South Australia 5034.

The Jersey breed has continued to improve and progress since its introduction into Australia in the pioneering days.

A popular modern cow, it has maintained the capacity to produce economically under a wide range of climatic and feeding conditions, showing adaptability throughout the diversified and harsh conditions existing in South Australia.

The milk from this medium-sized breed contains a high percentage of milk fat, protein, vitamins and minerals, with a correspondingly lower water content. Hence it is of high food value.

In the season just completed, a South Australian Jersey herd averaged, from 110 cows, 4 366 litres of milk and 232 kg of butterfat. A six-year-old cow from another herd produced in

one lactation 6 677 litres of milk and 363 kg of butterfat. In another performance, a Jersey milked 58 147 litres of milk containing 3 326 kg of butterfat in 12 lactations.

It is this longevity, superb calving and mothering ability from an early age, and, of course, proven production, that makes this docile cow so popular.

Research has proven the value of the Jersey cow in crossbreeding programmes using beef bulls.

Excellent Jersey genetic material is available in South Australia where studmasters share a common desire to further improve the standard of the breed, and where Jersey cows seem not to notice that they are in the driest State of the world's driest continent.

Jersey exhibits are consistently successful in inter-breed competitions at Royal Shows throughout Australia and have created an enviable reputation.

It is constantly being shown by the light-footed, but hardy Jersey — with her classic udder and dairy character — that she is the quietest, most efficient milk producer on four legs.

ANGUS SOCIETY OF AUSTRALIA

S.A. State Committee,
Angus Society of Australia,
R.A.H.S. Showgrounds,
Wayville,
South Australia 5034
Telephone: (08) 51 4951

THE MURRAY GREY BEEF CATTLE SOCIETY

460 Swift Street,
Albury, N.S.W. 2640
Postal address: P.O. Box 904,
Albury, N.S.W. 2640,
Australia
Telephone: (060) 21 6377
Telegraphic address: Murray Grey,
Albury, N.S.W.

The Murray Grey Beef Cattle Society administers the Australia-wide activities of the Murray Grey breed from its headquarters at Albury, on the Victorian/New South Wales border. Functions include the administration of society affairs, computerized recording of animals and programming of the national inspection system.

There are 1 561 Murray Grey studs throughout Australia. Murray Grey societies have been founded in Canada, New Zealand, the USA and Britain following the export of live cattle and semen from Australia. The society has been involved in the exportation of cattle and semen, and representatives of the society have visited Japan, USSR, Britain, New Zealand, Canada and the USA.

Correspondence and enquiries should be directed to the Director, Mr. A.J.S. Palframan, who is the society's executive officer and chief inspector.

MURRAY GREY BREED PROMOTION GROUP

C/- EXSAB,
SA Department of Agriculture and Fisheries,
G.P.O. Box 1671,
Adelaide,
South Australia 5001.

The Murray Grey Breed Promotion Group (Adelaide area) has about 100 members. Its committee is in touch with all local breeders and has intimate local knowledge.

Contact the chairman or secretary for a register of the studs that are interested in selling stock overseas.

THE SOUTH AUSTRALIAN POLL HEREFORD ASSOCIATION

R.A.H.S. Showgrounds,
Wayville,
South Australia 5034
Telephone: (08) 51 4951

POLL SHORTHORN SOCIETY OF AUSTRALASIA

SA Branch Committee,
"Newbold",
Gawler River,
South Australia 5118
Telephone: (085) 24 3116

AUSTRALIAN LIMOUSIN BREEDER'S SOCIETY

5th Floor, Gowing Building,
45 Market Street,
Sydney
New South Wales 2000
Telephone: (02) 211 1419
Cable: Austreps, Sydney

Regional Secretary,
C/- International Limousin Pty. Limited,
Box 320, P.O.,
Bordertown,
South Australia 5268
Telephone: (087) 537 228
Cable: Austelpa, Bordertown.

The Australian Limousin Breeder's Society was formed in 1971 to support and promote the interests of both pedigree and

commercial breeders of Limousin throughout Australia.

One of the world's oldest, most tested breeds, Limousin is establishing in Australia a reputation as a successful and highly efficient carcass breed.

LIMPLAN, a sophisticated technique developed by the society in conjunction with the Agricultural Business Research Institute's computer centre for measuring the performance of Limousin cattle, has become the breed's principal tool for growth measurement. The University of New England's computer is used for both pedigree registration in the Herd Book and performance recording.

The Limousin breed has already achieved an impressive record of carcass wins in competitions throughout Australia — from the tropics to the temperate south.

A great deal of emphasis is placed by cattlemen on breeding carcasses of exceptional yield and quality, and carcass competition results now indicate this success. For example, Limousin dominated hoof and hook judging, and gained the Grand Champion prizes, in both the Perth and Melbourne State competitions in September, 1978.

Bred in large numbers on all continents, the breed has also gained widespread acceptance in crossbreeding programmes already carried out throughout Australia.

High yield and cutability, efficient production, and a determined ability to thrive and breed under hard conditions, assure Limousin of a ready acceptance by breeders, butchers and consumers alike.

METRO PEDIGREE LIVESTOCK EXPORT CO.

102 Greenhill Road,
Unley,
South Australia 5061
Telex: Metmeat AA82218
Telephone: (08) 71 0223

Metro is an exporter of all stud and purebred livestock operating from all States of Australia. The company is part of the Metro Meat Group — a long-established Australian group of companies specializing in livestock supply and shipping, stock food manufacturing, carcass meat export, hide and skin exports, grain, merchandise and machinery export; the group also acts as ships providores.

Metro staff are fully experienced in the selection of all stud stock and are available for technical advice on feeding and farm care of the animals. Successful transportation of livestock is an exact science and the company has spent much time and money in perfecting it. Metro has produced its own feed pellets for on-board feeding and established farm facilities to pre-condition animals against travel stress. Metro can assure buyers of the arrival of their valuable animals in first-class order.

Metro can meet your breeding and meat needs by supplying stud and purebred dairy cattle, beef cattle, sheep, pigs, slaughter cattle, and feedlot weaners.

VICTORIAN ARTIFICIAL BREEDERS CO-OP. SOC. LTD.

P.O. Box 86,
Greenacres,
South Australia 5086
Telephone: (08) 262 1811

Victorian Artificial Breeders was formed in 1958 and began operations at its Bacchus Marsh (Vic.) property in 1960.

Farmer-owned and controlled, the society has evolved as Australia's largest bovine semen production and distribution organization.

Its direct involvement in South Australia came in 1975 when all facilities and activities of the South Australian Artificial Breeding Board were merged. Since that date, VAB has been the major supplier of dairy and beef semen to the State's beef and dairy industries.

Dairy semen — the largest proportion of sales come from A.B. proven Friesian and Jersey bulls.

A full range of other dairy breeds is available, including AMZ (Australian Milking Zebu) and AIS (Australian Illawarra Shorthorn), two unique Australian breeds.

Beef semen — is available from selected and performance-tested bulls of most British breeds, with a predominance of Angus, Hereford and Poll Hereford. Murray Grey, Brahman, Santa Gertrudis and Droughtmaster semen is also available.

The society carries stocks of insemination equipment and semen storage containers drawn from IMV of France and MVE of the USA.

Exports of semen and equipment are regularly made to New Zealand, South Africa, Indonesia, India, Britain, China, Malaysia and Canada.

THE AUSTRALIAN MEAT AND LIVE-STOCK CORPORATION

Live-stock Services,
5 Elizabeth Street,
Sydney,
New South Wales 2000
Telephone: (02) 231 1333
Telex: 22887

The Australian Meat and Live-stock Corporation (AMLC) is empowered by Act of Parliament to promote and control the export of livestock from Australia.

To ensure highest possible standards, only individuals or companies holding licences issued by the AMLC can export live-stock.

The corporation's control on exports also extends to quality assurance. Technical officers with experience in this field are available to assist industry.

The AMLC's promotion policy is to encourage and promote the sale of breeding livestock on overseas markets, giving particular attention, where possible, to animals having a top performance backing.

The corporation's responsibilities in livestock are administered by the Live-stock Services Division based at the AMLC's Head Office in Sydney.

The corporation has State offices in Brisbane, Melbourne, Hobart, Adelaide and Perth, and overseas as follows:

NEW YORK

One World Trade Center,
Suite 3269,
NEW YORK, NY. 10048
USA
Telephone: 212 432 9240
Telex: 235742

EUROPE

9 Kingsway,
LONDON, WC. 2
Telephone: 01 836 3018
Telex: 887169

MIDDLE EAST

Australian Embassy,
Shahryar Building,
248 Soraya Avenue,
TEHRAN,
Iran
Telephone: 83 5047
Telex: 215154

NORTH ASIA

World Trade Centre,
4-1 Hamamatsucho 2-Chome,
Minato-ku,
TOKYO 105
Japan
Telephone: 435 5785
Telex: 25669

SOUTH EAST ASIA

Suite 4101,
41st Floor,
OCBC Centre,
Chulia Street,
SINGAPORE

**ELDER SMITH
GOLDSBOROUGH MORT
LIMITED**

The Export Manager,
Livestock
27-39 Currie Street,
Adelaide,
South Australia 5000
Telephone: (08) 51 0331
Telex: AA82361
Cables: Elders G.M.

THE BANK OF ADELAIDE

81 King William Street,
Adelaide,
South Australia 5000
Telephone: (08) 51 0291
Telex: 82226

The Bank of Adelaide has served South Australia's rural and secondary industries for more than a century.

It is the only private trading bank incorporated in the State. It offers complete banking facilities at all branches and a comprehensive local and overseas travel service through its travel department.

The Bank of Adelaide has over 100 branches and agencies throughout rural South Australia.

CYCLONE KM PRODUCTS

589 Torrens Road,
Woodville West,
South Australia 5011
Telephone: 08 45 0261

In modern dryland farming agriculture, good fences are a vital part of land use and good management.

Careful selection and use of fencing will be repaid by easier work and more efficient land management over the years to come.

Cyclone are the major manufacturer of prefabricated Ringlock type fences in Australia. Ringlock fence is prefabricated by machines and the main requirement along the fence line is simply setting up end strainer posts and line posts. Prefabrication gives a mesh of wire and can be expected to be more effective under most farming conditions than fences that are hand-made from separate strands of either plain or barbed wire. The benefits of using prefabricated fencing are simpler, easier erection and greater effectiveness and economy.

For most dryland farm fencing applications we recommend Cyclone All Stock Strongline.

All Stock Strongline 7/90/60 is all high-tensile steel with heavier wires built in top and bottom. The one piece verticals are spaced at 60 cm, so no droppers are needed and posts can be spaced further apart. The high-tensile wire strength combined with designed spacing of line wires gives the built-in strength needed to control all stock, from cattle to sheep and goats. Tension crimps in the line wires give added resilience and elasticity, helping the fence absorb stock loading pressures and expansion and contraction of the wire due to temperature change.

The key to good fence design is a stable end strainer post. Cyclone All Steel Strainer Assemblies answer this problem. These drive-in End Assemblies are fully prefabricated from heavy-duty hot dip galvanized angle iron — fire, rot, and termite proof. They also have a unique ground anchor system that holds 120 cm-high Cyclone fence plus gates without sagging.

Cyclone is also Australia's leading manufacturer of all steel sheep and cattle yards, and prefabricated steel farm buildings, shearing sheds and grain storage silos. The company is currently exporting these products to seven countries in North Africa and the Middle East.

**THE AUSTRALIAN
DEPARTMENT OF TRADE
AND RESOURCES**

G.P.O. Box 447,
Adelaide,
South Australia 5001
Telephone: (08) 223 9911
Telex: 82521

The Australian Department of Trade and Resources has offices throughout the world. It acts as a link between people interested in Australian goods and services and the suppliers of commodities. Any enquiries about the entries in this directory can be made at any of the offices listed below.

ARGENTINA

K.J. Edwards,
Trade Commissioner,
Australian Embassy,
Avenida Sante Fe 846
BUENOS AIRES,
Argentina
Telephone: 32 6841
Telex: 121 946
Cables: Austemba Baires

AUSTRIA

R.L. McAuslan,
Trade Commissioner,
Australian Embassy,
Mattiellistrasse 2-4,
A-1040,
VIENNA,
Austria
Telephone: 52 8580
Telex: 74 313
Cables: Austrade

BAHRAIN

J. Butler,
Trade Commissioner,
Australian Consulate-General,
5th Floor,
Al-Fateh Commercial Building,
Al-Khalifa Road,
MANAMA,
Bahrain
Postal address: P.O. Box 252,
Manama, Bahrain.
Telephone: 255 011
Telex: Auscon BN 8236
Cables: Auscon

BELGIUM

J.C. Lloyd,
Senior Trade Commissioner,
Australian Embassy,
51-52 Avenue des Arts,
1040 BRUSSELS,
Belgium
Telephone: 511 3997,
513 4146
Telex: 21 834
Cables: Austrade

BRAZIL

W.F. Brigstocke,
Trade Commissioner,
Australian Consulate-General,
Edificio Eloy Chaves,
3 Andar, Avenida Paulista
2433,
01311 SAO PAULO,
Brazil
Postal address: P.O. Box
30 580, Sao Paulo, S.P.,
Brazil
Telephone: 280 0244
Telex: (011)23 787
Cables: Austcon

BRITAIN

LONDON
(Southern Britain, Rep. of
Ireland)
B.J. Hill,
Senior Trade Commissioner,
Australian High Commission,
Australia House, Strand,
London WC 2 B4LA, Britain
Telephone: (01) 438 8000
Telex: 27 565
Cables: Austcom

MANCHESTER

(Northern Britain including
Northern Ireland)
R.J. Barcham,
Trade Commissioner,
Australian Consulate-General,
Chatsworth House,
Lever Street,
Manchester M1 2DL, Britain
Telephone: (061) 236 9815
Telex: 668 596

CANADA

All trade inquiries should be directed to Vancouver or Toronto.

VANCOUVER

P.B. Clare,
Senior Trade Commissioner,
Australian Consulate-General,
Suite 800, Oceanic Plaza,
1066 West Hastings Street,
Vancouver.
Postal address: P.O. Box
12519, Oceanic Plaza,
Vancouver BC V6E 3X1,
Canada
Telephone: 684 1177,
684 1178
Telex: 04 507 580
Cables: Austcon

TORONTO

L.J. Martin,
Trade Commissioner,
Australian Consulate-General,
Suite 2324, Commerce Court
West,
King and Bay Streets,
Toronto, Ontario, M5L 1B9
Postal address: P.O. Box 69,
Commerce Court Postal
Station, Toronto,
Ontario M5L 1B9, Canada
Telephone: (416) 367 0783
Telex: 06 219 762
Cables: Austrade

OTTAWA (policy matters)

J.V. McMahon,
Trade Commissioner,
Australian High Commission,
13th Floor,
National Building,
130 Slater Street,
Ottawa, Ontario K1P 5H6
Canada
Telephone: 236 2684
Telex: 053 3391
Cables: Austrade

CHINA, PEOPLE'S REPUBLIC

B.F. Neal,
Trade Commissioner,
Australian Embassy,
15 Tung Chih Men Wai Street,
Chao Yang District,
PEKING (People's Repub. of
China)
Telephone: 52 2331
Telex: 22263
Cables: Austemba Peking

EGYPT, ARAB REPUBLIC OF

D.J. Richard,
Trade Commissioner,
Australian Embassy,
Mobil Oil Building,
1097 Corniche el Nil,
Garden City, CAIRO,
Arab Republic of Egypt
Telephone: 28 190, 28 663,
22 862
Telex: 92257
Cables: Austemba

THE EUROPEAN COMMUNITIES

J.C. Lloyd,
Senior Trade Commissioner,
Australian Mission to the
European Communities,
Australian Embassy,
51-52 Avenue des Arts,
1040 BRUSSELS,
Belgium
Telephone: 513 4146
Telex: 21 834
Cables: Austrade

FRANCE

J.M. Allgrove,
Senior Trade Commissioner,
Australian Embassy,
4 Rue Jean Rey,
75724, PARIS, Cedex 15,
France
Telephone: 575 6200
Telex: 20 2313
Cables: Austemba

GERMAN DEMOCRATIC REPUBLIC

BERLIN, GDR
J.L. Holmes,
Trade Commissioner,
Australian Embassy,
Niederschonhausen,
Grabbeallee 34-40,
111 Berlin, GDR
Postal: Postfach 650149,
1 Berlin 65, (West Berlin)
Telephone: 482 5224,
482 5225
Telex: 112460 (Ausem)
Cables: Ausem

GERMANY, FEDERAL REPUBLIC

BONN (Central and Southern Germany)
G.H. Watkins,
Trade Commissioner,
Australian Embassy,
Godesberger Allee 107,
5300 Bonn 2,
FR Germany
Telephone: (02221) 37 6941
Telex: 885 466
Cables: Austrade Bonn-Bad. Godesberg

HAMBURG (Northern Germany and West Berlin)
R.E. Jennings,
Trade Commissioner,
Australian Consulate-General,
Neuer Wall 39,
2 Hamburg 36, FR Germany
Telephone: 36 7138
Telex: 215 455
Cables: Austrade

GREECE

J.A. Morey,
Trade Commissioner,
Australian Embassy,
15 Messogeion Street,
Ambelokipi, Athens.
Postal address: P.O. Box 3070,
Ambelokipi, ATHENS,
Greece.
Telephone: 360 4611
Telex: 215 815
Cables: Austrade

HONG KONG

S.J. Maliphant,
Senior Trade Commissioner,
Australian Commission,
10th Floor, Connaught Centre,
Connaught Road,
HONG KONG
Postal address: P.O. Box 820,
Central Hong Kong
Telephone: (5) 22 7171
Telex: 73685
Cables: Austrade

INDIA

P.B. Horne,
Trade Commissioner,
Australian High Commission,
1/50G Shantipath,
Chanakyapuri,
NEW DELHI
Postal address: P.O. Box 5215,
New Delhi 110021, India
Telephone: 69 0336
Telex: 2356
Cables: Austrade

INDONESIA

T.E. Walton,
Senior Trade Commissioner,
Australian Embassy,
Borobudur Offices,
Jalan Lapangan Banteng Selatan,
JAKARTA
Postal address: P.O. Box 2076,
Jakarta, Indonesia
Telephone: 356 021-5
Telex: 46 214
Cables: Austrade

IRAN

W.G. Burns,
Senior Trade Commissioner,
Australian Embassy,
248 Avenue Soraya,
TEHRAN
Postal address: P.O. Box 3408,
Tehran, Iran
Telephone: 83 3017, 83 5047
Telex: IR 212 459
Cables: Austemba

IRAQ

G.N. Walls,
Trade Commissioner,
Australian Embassy,
141-377 Masbah,
BAGHDAD
Postal address: P.O. Box 661,
Baghdad
Telephone: 93 434
Telex: IK2148
Cables: Austemba

ISRAEL

A. Jackson,
Trade Commissioner,
Australian Embassy
185 Hayarkon Street,
TEL AVIV, Israel
Telephone: 24 3152
Telex: 033 777
Cables: Austemba

ITALY

ROME (Southern Italy)
G.W.S. Temby,
Senior Trade Commissioner,
Australian Embassy,
via Alessandria 215,
00198 Rome, Italy
Telephone: 84 1241
Telex: 610165
Cables: Austemba

MILAN (Northern Italy)
D.F. McSweeney,
Senior Trade Commissioner,
Australian Consulate-General,
via Turati 40,
20121 Milan, Italy
Telephone: 659 8727/8/9
Telex: 312 320
Cables: Austcon

JAPAN

TOKYO (Eastern Japan)
D.R. Fitch,
Senior Trade Commissioner,
Australian Embassy,
7th Floor, Sankaido Building,
9-13 Akasaka 1-Chome,
Minato-ku,
Tokyo 107, Japan
Telephone: 582 7231
Telex: 242 2885
Cables: Austrade

OSAKA (Western Japan)
W.T. McCabe,
Trade Commissioner,
Australian Consulate-General,
23rd Floor, Kokusai Building,
30 Banchi 2-Chome,
Azuchimachi, Higashi-ku,
Osaka, Japan
Telephone: (06) 271 7071
Telex: 522 5334
Cables: Austcongen

KENYA

G.B. Zegelin,
Trade Commissioner,
Australian High Commission,
2nd Floor,
Development House,
Government Road,
NAIROBI
Postal address: P.O. Box
44719, Nairobi, Kenya
Telephone: 33 4666
Telex: 22 203
Cables: Austrade

KOREA, REPUBLIC OF

D.K.W. Fagg,
Trade Commissioner,
Australian Embassy,
6th Floor,
Kukdong-Shell House,
58-1, 1-ka, Shinmoonro,
Chongro-ku,
SEOUL 110
Postal address: Box 562 P.O.,
Kwang Hwa Moon, Seoul 110,
Rep. of Korea
Telephone: 70 4158, 70 6491
Telex: 2263S
Cables: Austemba

MALAYSIA

T.N. Cronin,
Senior Trade Commissioner,
Australian High Commission,
6 Jalan Yap Kwan Seng,
KUALA LUMPUR 04-06
Postal address: P.O. Box 934,
Kuala Lumpur, Malaysia
Telephone: 20 0033, 20 0177
Telex: MA 30260
Cables: Austcom

MEXICO

R.F.E. Shaw,
Trade Commissioner,
Australian Embassy
4th Floor,
Paseo de la Reforma 195,
Mexico 5, D.F.
Telephone: 566 3055
Telex: 0177 3920
Cables: Austemba

NETHERLANDS

K.A. Baxter,
Trade Commissioner,
Australian Embassy Trade
Office,
Koninginnegracht 23,
THE HAGUE 2514AB,
The Netherlands
Telephone: (070) 63 0983,
(070) 64 7908
Telex: 32 008
Cables: Austrade

NEW ZEALAND

WELLINGTON
E.R.J. Hall,
Senior Trade Commissioner,
Australian High Commission,
72-78 Hobson Street,
Thorndon, Wellington 1
Postal address: P.O. Box
12145, Wellington North, NZ
Telephone: 73 6411
Telex: 3375
Cables: Austrade

CHRISTCHURCH

Trade Commissioner,
Australian Consulate-General,
8th Floor,
Bank of New Zealand House,
Cathedral Square,
Christchurch
Postal address: P.O. Box 2259,
Christchurch, NZ
Telephone: 795 000
Telex: 4526
Cables: Austrade

AUCKLAND

B.J. Hain,
Trade Commissioner,
Australian Consulate-General,
9th Floor, Lorne Towers,
10 Lorne Street,
Auckland 1
Postal address: P.O. Box 3601,
Auckland, NZ
Telephone: 32 429
Telex: 2516
Cables: Austrade

NIGERIA

J.E. Lightfoot,
Trade Commissioner,
Australian High Commission,
Investment House Annex,
21-25 Broad Street,
LAGOS
Postal address: P.O. Box 7974,
Lagos, Nigeria.
Telephone: 653 195,
653 008/9
Telex: 21 219
Cables: Austcom

PACIFIC ISLANDS

M.J.B. White,
Trade Commissioner,
Australian High Commission,
Trade Office,
7th Floor, Dominion House,
Thomson Street,
SUVA
Postal address: P.O. Box 1252,
Suva, Fiji
Telephone: 31 2844
Telex: FJ2126
Cables: Austrade

PAKISTAN

K.H. Jarvie,
Trade Commissioner,
Australian Consulate-General,
14-F Clifton,
KARACHI
Postal address: P.O. Box 3919,
Karachi, Pakistan
Telephone: 53 1086
Telex: 82 2619
Cables: Austrade

PAPUA NEW GUINEA

P.O.G. Forbes,
Trade Commissioner,
Australian High Commission,
WAIGANI
Postal address: P.O. Box 9129,
Hohola, Papua New Guinea
Telephone: 25 9333
Telex: NE 22109
Cables: Austcom

PERU

J.R. Gutteridge,
Trade Commissioner,
Australian Embassy,
6th Floor, Plaza Building,
220 Natalio Sanchez,
LIMA 11
Postal address: P.O. Box 2977,
Lima, Peru
Telephone: 28 8315
Telex: PE 25 265
Cables: Austemba

PHILIPPINES

J.N. Skinner,
Senior Trade Commissioner,
Australian Embassy,
CBC Building,
Paseo de Roxas and Villar
Street,
Makati, Metro,
MANILA
Postal address: Australian
Embassy, P.O. Box 1274 MCC,
Makati, Metro Manila,
Philippines
Telephone: 87 4961
Telex: 3542
Cables: Austrade

POLAND

F.T. Walsh,
Trade Commissioner,
Australian Embassy,
3/5 ul Estonska,
Saska Kepa, WARSAW
Postal address: P.O. Box 56,
Warsaw, Poland
Telephone: 17 6081
Telex: 813 032
Cables: Austemba PL.

SAUDI ARABIA

C.L. Williams,
Trade Commissioner,
Australian Embassy,
Ruweis Quarter,
JEDDAH
Postal address: P.O. Box 4876,
Jeddah, Saudi Arabia
Telephone: 51 303, 52 329
Telex: 401016SJ
Cables: Austemba

SINGAPORE

A.G. Rice,
Senior Trade Commissioner,
Australian High Commission,
25 Napier Road,
SINGAPORE, 10
Postal address: P.O. Box 470,
Tanglin, Singapore 10
Telephone: 37 9311
Telex: 21 238
Cables: Austcom

SOUTH AFRICA

J.D. Grigsby,
Trade Commissioner,
Traduna Centre,
13th Floor,
118 Jorissen Street,
2001 Braamfontein,
JOHANNESBURG
Postal address: P.O. Box
32263, Braamfontein,
2017 South Africa
Telephone: 39 1471-5
Telex: SA80 713
Cables: Austrade

SPAIN

E.B. Dillon,
Trade Commissioner,
Australian Embassy
Avenida Generalísimo 61,
MADRID 16, Spain
Telephone: 279 8504
Telex: 27 817
Cables: Austrade

SWEDEN

J.S. Nicholls,
Trade Commissioner,
Australian Embassy,
Sergelstorg 12,
S10342 STOCKHOLM 40
Postal address: P.O. Box 7003,
S-10386 Stockholm, Sweden
Telephone: 24 4660
Telex: 10 382
Cables: Austemba

SWITZERLAND

All trade inquiries for Switzerland
should be addressed to the
Trade Commissioner, Berne.

BERNE

J.N. McFarlane,
Trade Commissioner,
Australian Embassy,
Commercial Office,
13 Florastrasse,
3000 Berne 6,
Switzerland
Telephone: 44 9055
Telex: 32 965
Cables: Austemba

GENEVA

R.J. Hall,
Trade Commissioner,
The Permanent Mission of
Australia to the United
Nations Office at Geneva,
56-58 Rue de Moillebeau,
Petit Saconnex,
1211 Geneva 28,
Switzerland
Telephone: 34 6200
Telex: 22 665
Cables: Austunat

THAILAND

R.B. Hines,
Senior Trade Commissioner,
Australian Embassy,
6th Floor,
Anglo-Thai Building,
64 Silom Road,
BANGKOK
Telephone: 233 5970
Telex: 2621
Cables: Austrade

UNITED STATES OF AMERICA

All policy matters should be
addressed to Washington, trade
inquiries to Chicago, Honolulu,
Los Angeles, New York or
San Francisco.

WASHINGTON

R.S. Swift,
Senior Trade Commissioner,
Australian Embassy,
1601 Massachusetts Ave, NW,
Washington, DC 20036, USA
Telephone: (202) 797 3000
Telex: WU 892 621
Cables: Austemba

NEW YORK (East)

R.W. Holberton,
Senior Trade Commissioner,
Australian Consulate-General,
636 Fifth Avenue,
New York, NY 10020, USA
Telephone: (212) 245 4000
Telex: 230 12 328 Austcon
NYK
Cables: Australcom

CHICAGO (Central)

M.G.B. Coultas,
Senior Trade Commissioner,
Australian Consulate-General,
Suite 2216, One Illinois Center,
111 East Wacker Drive,
Chicago, Illinois 60601, USA
Telephone: (312) 329 1740
Telex: 25 4011
Cables: Austcon

LOS ANGELES

B.R. Rowell,
Senior Trade Commissioner,
Australian Consulate-General,
3550 Wilshire Blvd.,
Los Angeles California 90010,
USA
Telephone: (213) 387 8776
Telex: 67 4940
Cables: Austourist

SAN FRANCISCO (West)

F.D. Quinane,
Senior Trade Commissioner,
Australian Consulate-General,
Qantas Building,
360 Post Street,
San Francisco, California
94108, USA
Telephone: (415) 362 6160
Telex: 340 123
Cables: Austrade

HONOLULU

W.T. Corris,
Marketing Officer,
Australian Consulate,
1000 Bishop Street,
Honolulu, Hawaii 96813, USA
Telephone: (808) 524 5050
Telex: 633128
Cables: Austcon

**UNION OF SOVIET SOCIALIST
REPUBLICS**

W.J. Tinney,
Trade Commissioner,
Australian Embassy,
13 Kropotkinsky Pereulok,
MOSCOW, USSR
Telephone: 241 2035,
246 5012
Telex: 7474
Cables: Austemba

WEST INDIES

G.A. Hargreaves,
Trade Commissioner,
Australian Consulate-General,
Huggins Building,
72 South Quay,
PORT-OF-SPAIN, Trinidad
Postal address: P.O. Box 642,
Port-of-Spain, Trinidad
Telephone: 623 2536,
623 1478
Telex: Port-of-Spain 235
Cables: Austrade

**YUGOSLAVIA, SOCIALIST
FEDERAL REPUBLIC OF**

M. Johnson,
Trade Commissioner,
Australian Embassy,
Cika Ljubina 13,
11000 BELGRADE,
Socialist Fed. Rep. of
Yugoslavia
Telephone: 62 4655
Telex: 11 206
Cables: Austemba

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A TRUE COMEBACK



Dual purpose sheep

- high quality 22 to 25 micron wool.
- heavy cuts of wool per head.
- near top quality lambs.
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POLWARTHS are ideal for upgrading or crossing with other breeds and they thrive under a wide range of rainfall and climatic conditions.

Enquiries: The Polwarth Sheep
Breeder's Association of
Aust. (S.A.) Branch,
R.A.H.S. Showground,
Wayville,
South Australia 5034.

ELDERS EXPORTING

ELDERS SPECIALISE IN EXPORTS OF: LIVESTOCK – ALL CLASSES SHEEP, CATTLE, PIGS, HORSES • MEAT – MUTTON, LAMB, BEEF, PORK • GRAINS, COARSE GRAINS AND SEEDS • DAIRY PRODUCTS, MARINE PRODUCTS, MEAT AND BONE MEAL, FOOD-STUFFS, AGRICULTURAL MACHINERY AND EQUIPMENT, MINERALS, METALS AND ORES.

The history of Elders is very much the history of Australia. Founded in 1839, the Company's interests are widely diversified with the Group's main base being Australia's largest pastoral woolbroking house. Elders has offices in all mainland states of Australia with overseas offices located in London, Tokyo, Osaka and Hong Kong. An annual turnover of \$A1,208 million indicates the ability of Elders to offer overseas clients unrivalled service.



Australian Head Office
27-39 Currie Street, Adelaide, South Australia. Telephone: 51 0331.
Telex: AA82361. Cable: ELDERS GM
ELDER SMITH GOLDSBROUGH MORT LIMITED