Part 7

PRIMARY PRODUCTION

Land Settlement and Irrigation

Development of Victoria's Pastures

At its simplest, pasture improvement means the treatment of grazing land in such a way that the pasturage it bears is capable of carrying more livestock or of carrying them more effectively, or both. Further, it implies a transition from a primitive type of husbandry to a higher grade which requires more knowledge, more skill, and, incidentally, more capital investment. As better species of pasture plants grow luxuriantly, they naturally require more nutrients, and so fertile soils are necessary for their growth; any deficiency must be made good if they are to be encouraged. Each type of plant has its own requirements of moisture and temperatures and these conditions must be fulfilled if it is to grow luxuriantly. The ideal pasture must therefore consist of species which are best suited to the climatic conditions of the district concerned. The strains within a species may also be important and the soils must be capable of supporting that growth. Finally, if the pasture is to remain for years, the way in which it is managed, whether by the control of animals grazing on it, by cutting, or harrowing, or by the periodical addition of fertilizers, is all important. The whole process of pasture improvement may be summed up in the four words---species, strains, fertility, and management.

When the trees and shrubs were removed, the natural pastures which occupied most of south-eastern Australia, having between 30 inches and 18 inches of rainfall in the average year, were perennial Their normal growth started grasses with a summer resting period. when the rains of late summer and autumn moistened the soil, and it continued through winter to the spring when they flowered, seeded and then died down to ground level. During the dry summer only the basal part remained alive. The range of species was considerable, Wallaby grasses (Danthonia Spp) being the commonest with Silver Tussocks (Poa Caespitosa) and Rushes (Juncus Spp) in the wetter Among them grew many annual weeds. On the poorer soils, spots. heathy types of vegetation occurred. The former type was generally capable of carrying a dry sheep to the acre. The latter type was generally unsuitable for carrying stock for reasons which were only discovered in recent years.

Many attempts were made to introduce more productive species, especially from Britain. But these required a higher level of soil fertility than was generally present and also a better distributed rainfall. Introductions were seldom successful except on the more fertile alluviums of river valleys or on some of the cones of volcanic ash in the Western District. The success of superphosphate on wheat crops about 1900 encouraged some farmers to try the effects of topdressing some of their pastures with the fertilizer. The results varied but were sometimes spectacular. The Royal Agricultural Society of Victoria carried out a large programme of simple trial plots in many parts of the State. As they were not netted, rabbits often benefited, and it became clear that not only the rabbit but the sheep preferred the growth on phosphated plots. This new development met with much criticism wool would be coarser, foot and worm troubles with sheep would increase. But gradually graziers learned that all these difficulties, if real, could be avoided by more intelligent flock management.

The success of the movement was greatly influenced by the discovery that plants were at hand which could luxuriate when the level of soil phosphate was raised. The first was Wimmera Rye grass (Lolium hybridum), an unfixed hybrid which occurred by chance near Minvin. The second was Subterranean Clover (Trifolium Subterraneum), a native of the Mediterranean region with its autumn-winter-spring rainfall. The study of a collection of plants of the latter species growing in many parts of the State revealed that it had developed numerous "fixed" varieties some of which are specially suitable for certain districts. Another factor of significance in the growth of pasture improvement was the fertilizer subsidy of 15s. per ton first granted by the Commonwealth Government in 1933 and which continued at varying rates until 1951. In Victoria, the Pasture Improvement League was formed. Various commercial firms subscribed money to it so that a comprehensive scheme of pasture trials could be operated-mainly in dairy districts. The work was done by officers of the Department of Agriculture.

The balance of clovers and grasses is not always easy to maintain in a pasture. Generally the clover raises the nitrogen in the soil and this stimulates a more luxuriant growth of grasses. In seasons when rainfall is well distributed in the autumn, winter, and spring, the growth of these pastures may be very heavy and crops of meadow hay or silage are often taken for use in time when winter cold or drought has reduced growth.

The introduction of the tractor, the haybaler, and the buckrake and, later, the forage harvester, have greatly facilitated these processes. Better prices for farm products from 1943–1956 gave farmers enough income to buy this machinery and to construct haysheds, additional fences and water supplies, all of which are necessary for more effective stock management. The concession which the Taxation Department made in allowing a proportion of such expenditure to be a deduction in the computation of net taxable income was a great stimulus.

The process as described was important over wide areas, but parallel results were also obtained by raising soil fertility in regions where the rainfall was higher or lower. In much of the Wimmera, the Mallee, and the North-Central districts the spread of the rainy season in the average year is often too narrow for Subterranean Clover to complete its growth and reproductive cycle. For these regions other leguminous plants have been sought, and numerous species of medics (notably *Medicago tribuloides*) are promising. (See also pages 500–502.) A special note is necessary on the use of Lucerne (*Medicago sativa*) which on deep friable soils can develop a root system of 10 to 20 feet. This perennial species is capable of growing effectively on the Mallee sandhills if it is given adequate phosphate and is grazed with discretion. In irrigation districts it has a great reputation where drainage is efficient, although in recent years its position in irrigated country has been challenged by mixed pastures wherever the supply of water permits an irrigation as frequently as once a fortnight in summer.

In areas with higher and more frequent rainfall, pastures largely composed of the British species of Ryegrass (Lolium perenne), Cocksfoot (Dactylis glomerata), White and Strawberry clovers (Trifolium repens and fragiferum) are now common. Local strains of these grasses and clovers have developed and seed of these is now generally available. In addition summer-growing grasses are sometimes used in these pastures—notably Paspalum dilatatum, which came from South America via New South Wales, and occasionally Kikuyu (Pennisetum Cladestinum) from South Africa. It is noteworthy that all these species are introduced, the reason being that the natural vegetation of such districts was usually dense forest in which the grasses were highly specialized shade species unsuitable for growth in pastures.

In these regions of higher rainfall the soils are often heavily leached and consequently deficient in many elements necessary for the healthy nutrition of pasture plants or of animals. This is especially true where they are of sand or derived from sedimentary rocks. Apart from shortages of phosphorus, calcium and sulphur (which are overcome by the use of superphosphate), potassium is often a main deficiency, while some soils are so acid that lime may be necessary for effective establishment of the clovers. More significant still are the discoveries of recent years which have shown that the addition of traces of one or more other elements are often necessary before pasture improvement can occur. Four ounces of a salt of molybdenum to the acre may be all that is necessary on some soils to turn phosphate topdressing from a failure to a success. In other places a few pounds of a salt of copper or zinc may be required.

These recent discoveries have made it practicable to establish improved pastures on several million acres of land which was previously useless or of limited value. This has been a great stimulus to development, but it is necessary to emphasize that the transformation of low quality scrub land into effective farms cannot be achieved without large expenditure of capital and a considerable annual outlay. If the income from the proceeds of farming has to earn interest on that capital the price level of products is important.

Statistically the progress of pasture improvement is a somewhat difficult matter, because in some districts the mere application of superphosphate to a natural pasture over a period of years will sometimes lead to an invasion by better species—such areas have not been, technically speaking, "sown to improved species." In some ways the area top-dressed is a better measure of pasture improvement; but some farmers only top-dress land every second or third year. A further development in the last decade is the increased use of potassic fertilizers on pastures in dairy districts.

The positive results of pasture improvement are to be seen not only in the increasing numbers of stock carried in recent years and in the greater conservation of hay and silage, but also in the increased cut of wool per head, and milk per cow, and in the slaughter of beef animals at earlier ages.

The introduction of improved pastures for two or more years in the crop rotation on cereal farms has been a factor in the increased yields of wheat and other cereals which have been noteworthy in recent years. Conversely, in some districts with higher rainfall, areas of improved pasture when ploughed up and cropped give heavy crops of cereals. (See also pages 500 to 502.)

Alienation of Land

The total area of the State is 56,245,760 acres. On 31st December, 1959, this comprised:—

| Lands Lands Crown | alienated i in process lands | in fee-simp of aliena | ple tion | · · · · · · · · · · · · · · · · · · · | 31,301,377 1,587,302 23,357,081 |
|-------------------------|------------------------------------|--------------------------|-------------|---------------------------------------|---|
| | Total | | | | 56,245,760 |

.

The Crown lands comprise:---

| | Acres |
|---|------------|
| Permanent forests (under Forests Act) | 4,845,415 |
| Timber reserves (under Forests Act) | 710,541 |
| State Forest and timber reserves (under Land Act) | 151,499 |
| Water reserves | 317,295 |
| Reserves in the Mallee | 410,000 |
| Other reserves | 545,256 |
| Roads | 1,644,434 |
| Water frontages, beds of rivers, lakes, &c., unsold | |
| land in cities, towns, and boroughs | 3,846,111 |
| Land in occupation under | |
| Perpetual leases | 1,087,932 |
| Leases of former agricultural college lands | 29,926 |
| Other leases and licences | 1,991 |
| Temporary grazing licences and leases | *5,985,655 |
| Unoccupied | 3,781,026 |
| Total | 23,357,081 |

* In addition, 80,950 acres of land listed under Reserves are held under grazing licences.

In the following table are shown the area of Crown lands sold absolutely and conditionally, and the area of lands alienated in fee-simple during the five years 1955 to 1959. A portion of the area conditionally sold reverts to the Crown each year in consequence of the non-fulfilment of conditions by the selectors. The lands alienated each year include areas selected in previous years:---

| | | | Area | of Crown Land | Crown Lands Alienated in Fee-simple | | |
|---------------------------|----|-----------------------------------|----------------------------------|---------------|--|-------------------|---------|
| Year Ended 31st December— | | Absolutely, at Auction, &c. | Conditionally to Selectors | Total | Arca | Purchase Money | |
| | | | acres | acres | acres | acres | £ |
| 1955 | | | 1,637 | | 1,637 | 129,796 | 144,570 |
| 1956 | | | 3,475 | 4,901 | 8,376 | 96,010 | 130,775 |
| 1957 | | | 2,070 | 1,120 | 3,190 | 123,726 | 141,545 |
| 1958 | | | 5,480 | 23,763 | 29,243 | 51,396 | 151,672 |
| 1959 | •• | ••• | 30,972 | 51,075 | 82,047 | 123,202 | 310,895 |

VICTORIA—ALIENATION OF CROWN LANDS

Transfer of Land Act and Assurance Fund

Information on these topics will be found on pages 451-452 of the Victorian Year Book 1961.

Soil Conservation Authority

In addition to the information set out on pages 62 to 65, a statement of the functions and activities of this Authority will be found on pages 452 to 454 of the Victorian Year Book 1961.

Land Utilization Advisory Council

The members of the Council are the permanent heads, or their nominees, of the Soil Conservation Authority, Department of Agriculture, Forests Commission, Department of Crown Lands and Survey, and State Rivers and Water Supply Commission.

Its functions are to recommend to the Soil Conservation Authority the constitution and definition of catchment areas, and advise the Minister for Conservation and the Authority concerning policy on the use of land, including Crown land, in any catchment area. After consultation with the Council, the Authority determines the most suitable use in the public interest of all lands in catchment areas.

The practical result is that decisions are made about which land should be used permanently for forest purposes, and what land may be used for pasture, agriculture, or any other purpose without adversely affecting the catchment as a water supply area.

Primary Production

The conditions under which the various forms of land use may be permitted are defined by the Authority. There is, however, an aspect concerning the imposition of the conditions which is of particular interest. The Soil Conservation Authority, as provided for in its legislation, is obliged to consult the appropriate district advisory committee, and the Minister's approval must be obtained before the conditions of the use of land can be applied.

Landholders are liable to a penalty of up to £50 for non-compliance with the decisions, but there is a right of appeal. Should a landholder refuse to comply, the Authority may carry out any remedial work necessary and the costs may be recovered by reasonable instalments.

Soldier Settlement

Soldier Settlement Commission

Prior to the end of the Second World War, the Commonwealth Government and various State Governments made arrangements for the settlement of discharged soldiers on the land as part of a general scheme of rehabilitation of ex-members of the Services.

An Agreement was finally concluded between the Commonwealth and the various States in 1945 on this matter. This Agreement provided that Victoria, New South Wales, and Queensland would act as principal States and that Western Australia, South Australia, and Tasmania would act as agents for the Commonwealth Government.

In 1945, the Victorian Government completed an Agreement with the Commonwealth Government. The State Parliament ratified the Agreement and also passed legislation constituting the Soldier Settlement Commission which was to have three full-time members and was given the necessary authority to appoint staff.

Following the acquisition of a farm property or the setting apart of suitable Crown land, the Commission prepared a subdivisional plan. The holdings were advertised and settlers chosen after careful scrutiny of all applicants.

The Commission was charged with the responsibility of developing the holding to a point where the settler could anticipate earning a living from the holding within a reasonable time. This development programme included the construction of a farm dwelling, farm outbuildings, water supply (dams or bores), fencing, as well as pasture improvement work to lift the production of the holding.

In the initial stages the Commission provided suitable temporary accommodation pending erection of the farm house, and the settler entered into occupation of the holding and assisted in the development programme, such as erection of fencing, for which he was paid appropriate wages or contract rates.

When the stage was reached where the settler could expect a reasonable living from the holding, he was regarded as being in "effective occupation". From this time his career as a soldier-settler farmer commenced.

The Commission then determined an individual valuation of his block and was required by the Act to consider the yields and prices over a long-term period of the products which the holding was capable of producing.

The Agreement provided that the difference between this valuation and the total cost of acquiring, developing and improving the holding would be written off and shared equally between the Commonwealth and State Governments.

The settler is issued with a lease at the time the valuation is determined and the capital liability is repayable over a period of 55 years, including interest at the rate of 2 per cent. per annum. When the whole of the capital repayment is made, a negotiable freehold title issues.

Land Acquired and Allocated

Since the inception of soldier settlement to the 30th June, 1959, the Commission had acquired by voluntary negotiation or compulsory acquisition 1,206,560 acres of alienated land and 119,663 acres of Crown lands had also been set apart for soldier settlement purposes.

During the financial year 1959–60, 88,200 acres of this land were transferred to settlement under the Land Settlement Act 1959. With the transfer of this land, there evolved a clearer picture of the extent of the land actually dealt with under the Soldier Settlement Act.

The area of alienated land acquired totalled 1,192,601 acres purchased at a cost of £19,513,259, whilst a further 50,954 acres of Crown lands were set apart bringing the total area acquired or set apart to 1,243,555 acres. This land has been dealt with in the following manner:—

VICTORIA—SOLDIER SETTLEMENT COMMISSION : LAND ALLOCATION, 1945 TO 1960

| Particulars | Arca |
|---|-----------|
| | acres |
| Allocated for settlement involving 3,021 holdings | 1,172,280 |
| Awaiting allocation | 8,675 |
| Sold or disposed of as unsuitable for settlement purposes for reasons such as over-capitalised homestead areas or appropriation for public purposes | 62,600 |
| Total | 1,243,555 |

An analysis of the blocks made available for soldier settlement is as follows:—

VICTORIA—SOLDIER SETTLEMENT COMMISSION : BLOCK ALLOCATION, 1945 TO 1960

| | Type of Holding | | | | | | | |
|---|--|-------------------------------|----------------|----------|----------|--------------------------|--|--|
| Irrigation Holdings— Dairying Soft Fruit Orchards Dried Vine Fruits | | | | | | 674 68 246 | | |
| Rainfall Holdings— Dairying, and Dairying Grazing, and Grazing Cereal Growing and G Miscellaneous (Berries, | g and Mi and Mixe razing Vegetabl | xed Farmi ed Farmi les) | ning ng | | | 622 1,280 126 5 | | |
| Total | •• | | | | | 3,021 | | |

Classification of Applicants

No new applications for classification were registered during the 1959–60 financial year and thus the total number received to the 30th June, 1960, stands at 16,673.

Single-Unit Farm Loans

As distinct from the general subdivisional scheme, the Soldier Settlement Act also provided for the Commission to make loans to assist suitable and qualified ex-servicemen to purchase farms of their own choosing or to discharge existing encumbrances on farm properties already owned by them.

The interest rate on these loans, which were secured by first mortgage on the land, is 2 per cent. per annum and the Act authorized the Commission to advance up to 90 per cent. of its valuation of the farm to a maximum of $\pounds 9,000$. The period of repayment was similar to the general scheme, but varied according to the type of primary production involved.

This form of rehabilitation which has proved an outstanding success is solely a State responsibility and has been keenly sought by ex-servicemen possessing some capital, as it enabled them to get into production quickly and also possibly to remain in districts with which they are familiar.

Up to the 30th June, 1960, 2,883 ex-servicemen had been granted loans amounting to £12,006,650.

Commonwealth Agricultural Loans and Allowances

The Commission, on behalf of the Commonwealth, administered that portion of the *Commonwealth Re-establishment and Employment* Act 1945 which related to the granting of agricultural allowances and the making of agricultural loans.

These loans were limited to $\pounds 1,000$ in each case and were designed to assist ex-servicemen to rehabilitate themselves in the farming industry they had left to join the forces. The loans were used either to assist in the purchase of a farm property or to help in restocking, acquiring plant, &c., so that an ex-serviceman could re-establish himself on his farm.

Loans totalling £1,796,787 have been made to 2,970 cases, including 548 applicants, who have been assisted in purchasing farm properties.

Agricultural allowances to 2,311 applicants have been granted at an estimated cost of £296,013. These allowances, which were not repayable and were made in the form of a weekly sum for a period of twelve months, aimed to assist the ex-serviceman again to find his feet in his pre-war farming occupation.

Owing to the statutory limits on the time in which applications may be made for Agricultural Loans and Allowances, there has been no change in numbers during the past year and it is not anticipated there will be any future increase.

Summary

The total number of former members of the forces who have received rural rehabilitation on the land is as follows:—

VICTORIA—RURAL REHABILITATION OF EX-SERVICEMEN, 1945 TO 1960

| Act | Number of Ex-servicemen |
|--|-------------------------------|
| Soldier Settlement Act— | |
| Number allotted a holding under the general subdivisional scheme Number allotted a holding under the general subdivisional scheme, but for various reasons (ill health, death, compulsory forfeiture, &c.) have relinquished holdings allotted to them Number granted single-unit farm loans | 3,021 219 2,883 |
| Commonwealth Re-establishment and Employment Act 1945 | |
| Number granted agricultural loans for purchase of land | 548 |
| Number granted agricultural loans for purchase of stock, plant, &c., to work properties | 979 |
| Total | 7,650 |

Other Land Settlement

Introduction

The Land Settlement Act 1953, which was repealed and replaced by the Land Settlement Act 1959, envisaged a general civilian settlement scheme (on similar lines to that provided under the Soldier Settlement Act) which would come into operation as soldier settlement tapered off.

The 1959 Act lays down the principles under which this scheme is to operate.

The Commission is given authority to purchase privately owned land or set apart suitable Crown land for development and subdivision.

Generally speaking, any male British subject over the age of 21 years is eligible to apply for land made available, but the actual allocation is made having regard to a number of factors laid down in the Act, including the applicant's experience and prospects of success.

Tenure

After a settler is allocated a holding, he may in the first instance be employed by the Commission on wages, or he may be granted a temporary lease of his holding. It has been necessary to provide for a wide range of contingencies in the temporary lease stage to cover a wide range of circumstances, such as the allocation of a more or less ready-made farm as compared with a farm where considerable developmental work is still required. The minimum period for a temporary lease is one year and the maximum period is five years. A settler with temporary lease will be required to pay such rent as the Commission thinks fit and reasonable, taking into account differing circumstances, particularly those connected with production.

When a farm has been developed to a stage where the settler of average efficiency can successfully carry on, provision is made for the grant of a purchase lease. This purchase lease provides for the determination of a capital liability on which the settler pays 5 per cent. per annum, which includes interest at 4 per cent. per annum on the liability from time to time outstanding. This means that in about 41 years a settler would freehold his farm although it can be freeholded earlier if larger amounts are paid against the capital liability. The purchase lease is not negotiable for a period of six years, but this six-year period may be reduced by up to three years if he has been in occupation under temporary lease up to three years. In determining the capital liability under the lease, the Commission has regard to market values of the holdings, but disregards any abnormality in seasonal or economic conditions which may affect current market value.

Settlers' Credit Account

Under the Act settlers will be encouraged to make additional payments in excess of those required under the lease. These excess payments would earn interest in a special credit account at a rate equal to long-term bond rates.

Advances to Settlers

Advances may be made to settlers for stock, plant, seasonal requirements, living and working expenses and for permanent improvements. Interest at the rate of 4 per cent. per annum is charged on the amount of the advance from time to time outstanding, and the repayment of the advance with interest made over such a period as determined by the Commission in any particular case.

Conclusion

As mentioned on page 475, an area of 88,200 acres was transferred from soldier settlement to settlement under the Land Settlement Act.

During 1959–60 considerable development work was completed at the three land settlement projects, namely, Heytesbury near Cobden, Yanakie on Wilson's Promontory, and the East Goulburn Project in the Parish of Dunbulbalane.

At the 30th June, 1961, 86 holdings had been allocated under the new scheme, and of these 62 blocks were allotted during the year under review. The demand for this form of settlement is exceedingly keen and this is evidenced by the fact that the 62 holdings allocated during 1960–61 attracted over 3,000 applicants.

Water Supply and Land Settlement

Irrigation

There has been much irrigation development in Victoria, which has led the rest of Australia in this field, and today water is supplied annually to more than a million acres of agricultural lands which yield almost one-fifth of the total primary production of the State.

There were isolated instances of irrigation in Victoria more than 100 years ago—with some cases recorded as early as 1844—but seasons were deceptively good in the 1860's and early 1870's and there was no large-scale development.

However, from 1877 to 1881, conditions were very dry, and as this followed the decline of alluvial gold mining with consequent large-scale agricultural settlement on the Northern Plains under the Macpherson Grant Land Act of 1869, there was a great deal of agitation for Government action to improve water supplies. This led to the first big step—the appointment in 1880 of an engineer and a surveyor, to report on the water supply and irrigation of the Northern Plains.

Their reports led to the Water Conservation Act of 1881 and the Irrigation Act of 1883, but neither had much impact on irrigation. In 1884, only 163 farmers were irrigating 7,000 acres—three-quarters being wheat land—mostly in Swan Hill Shire.

In the same year, however, advocates of irrigation were rewarded by the appointment of a Royal Commission on Water Supply, led and inspired by Alfred Deakin, then Victorian Minister of Water Supply and later Prime Minister of Australia. The work of this Royal Commission was responsible for the revolutionary Victorian Irrigation Act of 1886 which, among other things, virtually nationalized the State's water resources (by vesting in the Crown the right to the use of water in any watercourse) and provided for the establishment of local Trusts to carry out works with Government loan funds.

The 1886 Act put irrigation on the map. At the turn of the century, a total of roughly 100,000 acres were watered by nearly 90 Trusts. However, control by Trusts proved a failure owing to insufficient conservation, divided control of water resources, inadequate charges, and irregular revenue because water was used on a large scale only in dry years.

In 1899, the State wrote off three-quarters of the Trusts' capital liabilities and finally, by the Water Act 1905, abolished the Irrigation Trusts, providing instead for control by a Government instrumentality, the State Rivers and Water Supply Commission*. On behalf of the Crown, this authority controls the development and utilization of all of Victoria's water resources, except those specifically reserved to supply the Melbourne Metropolitan Area. Since its constitution 55 years ago, there has been a tenfold increase in the area irrigated.

To overcome the problem of irregular revenue experienced by the Trusts, the 1905 Act introduced a system under which all lands in irrigation districts were apportioned water rights, assuring them of specified quantities of water for which they had to pay in all years, whether they used these quantities or not. The aim was to compel landowners to use water or sell their lands to those who would develop them for irrigation.

Nationalization of surface water resources and the introduction of compulsory water rights—the two main planks of Victoria's irrigation policy—were thus established, and a third important feature, that of closer settlement, was instituted by Dr. Elwood Mead, a leading U.S. irrigationist who was invited by the Government of Victoria to become Chairman of the State Rivers and Water Supply Commission. Mead held this position from 1907 to 1915, when he returned to the U.S.A., later becoming head of the U.S. Bureau of Reclamation. Before his arrival, irrigation was used mainly as an adjunct of large area "dry" farming, but Mead saw that these large area farmers were not vitally interested in irrigation and that they did not make the best use of the water available to them.

Mead's aim was intensive irrigation on small farms, and his policy of acquiring and subdividing large holdings for closer settlement was followed energetically from 1910 to 1930. In that period, more than 4,000 new farmers—ex-soldiers and civilians—were established on irrigated holdings throughout the State, and the total area irrigated in 1930 was some 500,000 acres.

Many new works were constructed during this period, including the first works to regulate the River Murray. Controversy had raged

[•] Subject to overall supervision by the Commission, the First Mildura Irrigation Trust still controls the famous pioneer settlement at Mildura started in 1886 by the Chaffey Brothers, two Canadians invited to Australia by Alfred Deakin.

over the development of the Murray for 50 years owing to the conflicting interests of the three interested States, New South Wales, Victoria and South Australia. Finally, after an interstate conference in 1902, and a conference of engineers in 1913, the three State Governments and the Commonwealth Government reached agreement and signed the River Murray Waters Agreement in 1915. Under this, the four contracting parties agreed to share equally in the cost of certain named works, and a formula was reached guaranteeing South Australia certain quantities of water, the remainder being shared equally between Victoria and New South Wales. This Agreement still stands in principle, although substantial variations have been made to the original by the addition of new works, &c.

Irrigation development was slowed down by the depression of the early 1930's, which was particularly severe on primary producers, and when some signs of recovery were evident, the Second World War brought the construction of storages and channels almost to a standstill. The prices of primary products rose rapidly during the War, however, with a resultant increase in the demand for water which put a great strain on existing works. Following the end of hostilities in 1945, new projects were started at an unprecedented rate.

Much post-war construction has been concentrated on development of the Goulburn–Loddon System which serves an area of some 1,250,000 acres between the Goulburn and Loddon Rivers. New works completed since 1955 to serve this area are the Eildon Reservoir enlargement on the Goulburn River, and Cairn Curran and Tullaroop Reservoirs on the Loddon and one of its tributaries, respectively, adding in all some 2,625,000 acre-feet to the storage capacity of the system, whilst work is currently proceeding at Eppalock Dam on the Campaspe River to add some further 250,000 acre-feet.

Other major projects in the post-war period have been the development of large soldier settlements around Numurkah, Robinvale and Maffra, resulting in the establishment of almost 1,000 new farms.

In 1945, the capacity of Victorian storages used solely or almost solely for irrigation was about 1,700,000 acre-feet; at 30th June, 1960, it was approximately 4,700,000 acre-feet, and when works under construction are finished, the figure will rise to 5,250,000 acre-feet. Besides the Goulburn System storages referred to, Hume Reservoir on the Murray River and Glenmaggie Reservoir on the Macalister River have both been enlarged. The area irrigated has exceeded 1,000,000 acres in the last two years and substantial increases are certain.

Following the policy instituted by Elwood Mead, the Commission has continued to foster intensive development. In the Goulburn System very few new areas are being served, the extra water being given to existing irrigators, especially in the less well developed areas. The new settlements which have been established are all highly intensive.

Major storages devoted principally to irrigation are shown in the following table:---

| River | | Nar | ne | Capacity | Principal System or District Served | |
|-------------|-----|--|-------------|--|---|--|
| | | | | acre-feet | | |
| Goulburn | •• | Eildon Reservoir Goulburn Weir Waranga Reservo | pir | 2,750,000 20,700 333,400 | Goulburn-Loddon Goulburn-Loddon Goulburn-Loddon | |
| Loddon | ••• | Cairn Curran Tullaroop | •• | 120,600 60,000 | Goulburn-Loddon Diverters | |
| Murray | •• | Hume Murray River W | eirs | 900,000* 111,420* | Murray Murray | |
| Macalister | •• | Glenmaggie | | 154,300 | Macalister (Gipps- | |
| Pykes Creek | | Pykes Creek | | 19,400 | land) Bacchus Marsh | |
| Werribee | •• | Melton | | 15,500 | Werribee | |
| | | Total | | 4,697,480† | | |

VICTORIA—MAJOR IRRIGATION STORAGE SYSTEMS

Victoria's half share of River Murray storages under the River Murray Agreement. When completed, Hume will have a total capacity of 2,500,000 acre-feet.
 † In addition to the storages named, the total includes a system of natural lakes in the Kerang-Swan Hill area and the Coliban River storages used for both irrigation and town supply around Bendigo.

The following table compiled by the Commission shows the total areas of the various irrigation systems and the areas under irrigated culture during 1959-60:-

VICTORIA—AREAS OF SYSTEMS AND LANDS IRRIGATED, 1959-1960

(Acres)

| | | | Area Irrigated | | | | | | | |
|--|--------------|---|----------------------------------|------------------------------------|--------------------------------|-------------------------|-------------------------|------------------------------|----------------------------|---------------------------------------|
| System or District | | Total Area | otal Pastures | | Lu- cerne, | e, Vine- m, yards | Or- chards | Mar- ket Gar- dens | Other | Total |
| | | | Native | Sown | Sor- ghum, &c. | | | | | |
| Goulburn-Loddon System . | | 1,257,023 | 23,160 | 379,737 | 24,538 | 254 | 20,633 | 3,427 | 24,181 | 475,930 |
| Torrumbarry System Murray Valley Area Pumped Supply* | • | 340,986 267,810 80,736 | 32,208 2,029 582 | 179,521 91,652 579 | 8,794 8,509 678 | 4,271 13 36,112 | 1,568 5,253 2,824 | 1,573 459 264 | 10,568 2,043 623 | 238,503 109,958 41,662 |
| Total River Murray . | • | 689,532 | 34,819 | 271,752 | 17,981 | 40,396 | 9,645 | 2,296 | 13,234 | 390,123 |
| Macalister District (Gippsland Werribee-Bacchus Marsh Other Systems Private Diversions‡ | 1) - - | 1 32,876 16,376 †19,735 § | 2,862 1,636 1,019 9,844 | 49,609 4,505 8,784 59,881 | 1,711 730 1,448 9,173 | 3,123 | 561 3,532 5,241 | 8 3,956 1,733 9,208 | 583 715 626 6,236 | 54,773 12,103 17,147 102,706 |
| Total | • | 2,115,542 | 73,340 | 774,268 | 55,581 | 43,778 | 39,612 | 20,628 | 45,575 | 1,052,782 |

 Including First Mildura Irrigation Trust (13,722 acres irrigated) supervised by the Commission. † Campaspe District only.

[‡] Area authorized to be irrigated, excludes 37,529 acres irrigated by private diverters in the Torrumbarry Irrigation System.

§ Not available.

The most important works under construction are the $\pounds 15$ mill. channel enlargement and remodelling programme in the Goulburn– Loddon Irrigation System. This has been necessitated by the enlargement of Eildon Reservoir and the construction of Cairn Curran and Tullaroop Reservoirs, which have enabled more than twice as much water to be supplied to the System as was previously available. Half of the new channel works have been finished, and at the present rate of progress, the programme should be finished in six years, subject to the availability of funds.

A major job commenced in 1959–60 is the enlargement of the small Eppalock Reservoir on the Campaspe River to store up to 250,000 acre-feet. With associated works, this will cost £5 mill. over a period of three years, and will benefit mainly the Coliban System and Goulburn Irrigation System.

Victoria will also benefit greatly by enlargement works being carried out for the River Murray Commission at Hume Reservoir.

Domestic and Stock Supply

A system of storages in the Grampians, on the Wimmera and Glenelg Rivers, provides a domestic and stock supply for 10,000 square miles of land in the Wimmera and Mallee Districts. Another 1,300 square miles in the Mallee are served by water pumped direct from the Murray River and 400 square miles in the Walpeup area are served by sub-artesian bores. The total area in the Wimmera and Mallee given a domestic stock supply is thus 11,700 square miles more than one eighth of the State.

The Wimmera-Mallee Domestic and Stock Supply System is the largest scheme of its kind in the world. Without this water supply, development of the area would be meagre in most parts, and in some areas it would be impossible. With the water supply, however, the area can support about 65,000 persons, and yield primary production worth about £30 mill. or about 10 per cent. of Victoria's total primary production.

Some attempt was made to provide an artificial supply of water to the Wimmera as early as 1844, but nothing much was done until the 1880's when Wartook Reservoir was built for a local trust (see pages 410–411 for description of trusts). However, this storage proved inadequate in the disastrous drought of 1902. The trust system was taken over by the State Rivers and Water Supply Commission in 1909 and since that date a series of extensive improvements have been carried out, largely necessitated by ever-increasing development in the area and usually receiving impetus or authorization from a drought or a threatened failure of supply. With the completion of Rocklands Reservoir on the Glenelg River in 1953, the security of the water supply was assured. The capacity of the Grampians storages now totals 538,900 acre-feet (Rocklands 272,000) and even a limited amount of irrigation can be carried on. The problems of the area now centre round the distribution of water with maximum efficiency. As with irrigation, the area is divided into districts. Water is channelled into farmers' dams each winter and spring—the seasons of minimum evaporation—total deliveries being 100,000 acre-feet in a normal year. Another feature shared with the irrigation districts is that interest on the capital cost of the system (\pounds 7,500,000) is carried by the State; the farmers pay for operation and maintenance only. The average farmer pays about £50 per year for his water supply.

The removal of sand drifting into the channels used to be a very great problem, but has now been reduced by better farming, regulations governing fallowing and burning near channels, and planting rye corn to stop drift.

Flood Protection, River Improvement and Drainage*

The major flood protection work in Victoria has been the drainage of the Koo-wee-rup Swamp, a depression of 80,000 acres along the seaboard of Westernport Bay, south of the main Gippsland railway. Once useless, this area supports a population of about 4,000 and yields primary production worth approximately £3 mill. annually.

Another important area controlled by the Commission is the Carrum Drainage District comprising 30 square miles of low-lying land extending four to five miles inland from Port Phillip Bay and separated from the sea by a broad sand ridge on which are established six bayside towns from Aspendale to Seaford. About 7,000 persons benefit to some degree from flood protection works in this district and construction works, estimated to cost £500,000 over a period of years, are being carried out to bring in further areas and provide still greater assurance against flooding.

A comparatively recent development has been in the field of river improvement—the removal of obstructions and the prevention of erosion and siltation. Under the *River Improvement Act* 1948, provision was made for the formation of local trusts operating under the supervision of the Commission with power to carry out works and levy rates. Nineteen trusts have since been established and are assisted by grants from the Government amounting to about £175,000 annually. In addition, river improvement work is helped by grants from the Rivers and Streams Fund (about £40,000 annually) which comprises mainly licence and permit fees paid for the right to divert water from streams.

A major work recently completed at a cost of about £500,000 is the Lake Corangamite project, north-west of Colac. About 12,500 square miles of private land were flooded between 1952 and 1956 and as there is no outlet from the Lake, it would have been necessary to rely on evaporation for relief by natural agencies. Accordingly, work was undertaken to divert floodwaters, which would otherwise have entered Lake Corangamite, by a channel leading $24\frac{1}{2}$ miles into the Warrambine Creek, which is a tributary of the Barwon River. Besides relieving flooding, this scheme will free a large part of the area around the lake for agricultural use in most years.

^{*} Drainage works are also needed in most irrigation districts.

Spray Irrigation in Agriculture and Dairying

Spray irrigation in Victoria, for the growing of pastures and fodder crops, is mainly used in connection with private irrigation schemes, and consequently the area irrigated by this method is very small compared with that irrigated by flood systems.

Of the three types of spray irrigation equipment available (low pressure, medium pressure, and high pressure), the medium pressure (35 to 50 pounds per square inch) is the most popular. The normal delivery of water from the spray heads is equal to 20 to 30 points of rain per hour. Various automatic systems have been devised to eliminate the shifting of portable spray lines, which requires three-quarters of an hour's work per acre per irrigation. Naturally, these automatic systems are more expensive to install and may cost up to £200 per acre compared with a figure around £40 per acre for manually shifted lines.

Some large individual areas of over 100 acres of spray irrigation per farm can be found in Victoria, but the vast majority of private schemes employing this method are of 10 to 20 acres only. This area is generally all that the available water supply can irrigate.

The main crop irrigated is perennial pasture, in which the main species employed (in varying proportions) are perennial ryegrass, cocksfoot, paspalum, white clover and strawberry clover. However, some maize, Japanese millett, saccaline, and cruciferous fodder crops are also grown.

The expense attached to a small private irrigation scheme is high, and consequently efficient utilization of the fodder produced is necessary if the full benefit of the scheme is to be obtained. Rationing of the feed by subdivision, strip grazing or restriction of time allowed for grazing, is usually considered necessary. Using such methods, one acre of irrigated perennial pasture can maintain the lactation of up to four cows throughout the whole of the summer, and this is profitable. The employment of an expensive private irrigation scheme for fodder conservation alone is not by any means as profitable.

Agricultural Research, Extension, and Education

Research

Department of Agriculture

The high standard of Victoria's agriculture, which produces more than one quarter of Australia's primary produce (measured in terms of value) from less than one thirtieth of the nation's area, is due in no small measure to the programme of research and advisory services undertaken in recent years.

Backed by large financial allocations, the Department of Agriculture programme has concentrated on the strengthening of existing research stations with new and up-to-date facilities, establishing new research centres, developing new research projects, and intensifying advisory services. In recent years, improvements have included a new animal husbandry research laboratory and extensions to the plant breeding laboratory at the State Research Farm, Werribee; considerable additions to the Plant Research Laboratory, Burnley; new laboratories at the Scoresby and Tatura Horticultural Research Stations; and additional research facilities at the Mallee Research Station, Walpeup, Rutherglen Research Station, Tobacco Research Station, Myrtleford, Dairy Research Station, Ellinbank, and the Potato Research Station, Healesville.

Two new research stations—the Pastoral Research Station, Hamilton, and the Irrigation Research Station, Kyabram—have been established and considerable areas of adjoining land have been bought at Scoresby and Rutherglen to ensure the expansion of research in those areas.

At research centres strategically located in Victoria's rural areas, highly trained scientists are seeking the answers to a wide range of problems which face the primary producer trying to improve the efficiency of his farm. These scientists have already made many notable discoveries which have benefited Victorian agriculture. Outstanding results during the last few years include:—

(1) Release of the following new plant varieties to growers-

Wheat: Olympic, Beacon, and Stockade.

Oats: Alpha.

Medic: Harbinger.

Linseed: Hazeldean and Bonnydoon.

Flax: Currong and Standard.

Tobacco: Golden Crest.

Peaches: Tatura Sunrise, Tatura Dawn, Tatura Sunset, Tatura Aurora. New varieties of beans, brussels sprouts, cauliflowers and strawberries, have also been made available to farmers.

- (2) A new technique for crossing previously incompatible species of tomatoes. This was done for the first time in the world.
- (3) A new cool storage technique to reduce brown rot damage on peaches.
- (4) Further progress in controlling cool storage rot in Granny Smith apples.
- (5) A storage technique to control black spot in potatoes.
- (6) A cool storage technique to provide high quality pears for the market throughout the year.
- (7) A method of controlling bitter pit of apples.
- (8) Techniques for the eradication of swine plague and the establishment of pneumonia-free piggeries.
- (9) A new method of identifying milk from cows which have been treated with penicillin.
- (10) Field tests for ovine brucellosis.

Extension

To speed these research results to the farming community, the Department of Agriculture is appointing each year additional trained advisory officers throughout rural Victoria and recruitment of this staff has been greatly stimulated by scholarships in agricultural science at Melbourne University, in veterinary science at Sydney and Queensland Universities and in dairy science at Massey Agricultural College, New Zealand.

These advisory officers use every method of communication to channel technical facts to farmers. Much of their time is taken up with on-the-farm advice, but they also speak at field days and hold discussion group meetings. Their work is also backed by the Department of Agriculture's intensified production of publications, films, and radio services.

The monthly Journal of Agriculture, once the Department's only major publication, is now accompanied by the regular industry digests and bulletins. Specially prepared to cater for specific industries (livestock, dairying, potato, horticulture, vegetable and beekeeping) these publications now have a total distribution of about 250,000 copies a year.

Agricultural films produced by the Department and other organizations are screened to farmers by touring mobile projection units. These films are shown to many thousands of primary producers each year. Many favourable comments on the educational value of the Department's farm radio programme—the Voice of Agriculture—have been received from primary producers. This programme emanates weekly from every commercial station in rural Victoria. Total broadcasting time is over four hours a week.

Agricultural Education

Department of Agriculture

The Victorian Department of Agriculture through its Division of Agricultural Education has the responsibility for agricultural education at the diploma level in the residential agricultural colleges at Dookie and Longerenong and the non-residential horticultural college at Burnley Gardens.

The main purpose of the colleges is to teach the principles and practice of agriculture and horticulture to those who intend to adopt practical farming or horticulture as a vocation and require a more intimate knowledge of agriculture or horticulture than can be acquired merely through practical experience. In addition to achieving this main purpose, the diploma courses also provide a basic training for officers who are later employed by technical government instrumentalities and by firms which manufacture or distribute farmers' requisites or handle farm produce. Some diploma holders engage in teaching agricultural science in schools and others in agricultural From the horticultural college, some diploma holders iournalism. proceed to a career in the administration of municipal parks and gardens as well as to such occupations as orchardist, nurseryman, florist, and landscape gardener. Each college offers a diploma course of three years' duration.

With the recent completion of new main buildings, the college at Dookie has accommodation for 260 full-time students, including about 50 second-year University degree students. Longerenong accommodates 70 students. A current building programme will shortly increase the accommodation at Longerenong to 100 students. Burnley Horticultural College has accommodation for 60 diploma students, but also conducts numerous part-time evening classes for persons engaged in horticultural industry and for home gardeners.

As well as training in the vocational subjects, the students are given a good grounding in the related sciences—chemistry, soil science, physics, botany, zoology, entomology, bacteriology, plant pathology and genetics, and in elementary mathematics and agricultural engineering, including surveying. English is taught to Matriculation standard and a good grounding is given in book-keeping and rural economics and management. Students who do well in the diploma course and pass in Matriculation English Expression can, if they so desire, proceed to a degree course in agricultural science and other courses at the University of Melbourne.

Short intensive courses of from one to three weeks' duration in specialized farm subjects are conducted regularly at Dookie Agricultural College for the benefit of members of the farming community. These include a special class each year for country women and a junior young farmers' course.

The Agricultural Education Division is also closely associated with the Royal Agricultural Society of Victoria in the administration and fostering of the Senior Sections of the Young Farmers' Clubs in Victoria and, through a representative Advisory Council, administers an annual government grant for this purpose. The Division also takes a prominent part in the organization of training of visiting Fellows who have been awarded fellowships for training in Australia either through the Colombo Plan or the Food and Agricultural Organization.

Melbourne University School of Agriculture

The School of Agriculture of the Melbourne University provides a four year degree course for undergraduates leading to the Degree of B.Agr.Sc. and post graduate work for higher degrees in Agricultural Science. The undergraduate course is based on a first year devoted to pure science subjects; this is followed by three years in which the scientific principles upon which the practice of agriculture is based are presented and the more intensive training is given in those scientific disciplines required by research workers in agriculture. During the second year of the course, the students are in residence at Dookie Agricultural College, where they have the opportunity of combining the advantages of communal college life with close observation and contact with the practice of agriculture.

Research activities at the School of Agriculture cover a wide field including agronomy, agrostology, and animal nutrition and physiology, with basic work in the fields of soil chemistry and agricultural biochemistry as related to both the plant and the animal. Research into various aspects of agricultural economics and farm management, together with studies of the sociological relationships of the farming community and of the farmer himself, are also undertaken.

The graduates from the School find employment over a wide range of positions. Many join the State Service in such departments as Agriculture, the State Rivers and Water Supply Commission and the Soil Conservation Authority. The more academic students after taking post graduate training go to research positions in the Commonwealth Scientific and Industrial Research Organization or the Universities, but a number with more commercial interests are taking positions in industrial organizations related to agriculture.

Rural Industries

Introduction

Collection of Statistics

Since the year 1904, police officers have been required to collect agricultural, pastoral, and dairying statistics from land holders in Victoria. Prior to 1904, the statistics were collected by the municipal authorities who were required by statute to furnish information on such forms and in such manner as was required by the Governor in Council.

The rural statistics contained in this chapter are in the main compiled from annual returns of agricultural, pastoral, and dairying production collected from 70,000 rural holdings in Victoria at 31st March each year. Schedules are distributed to farmers by about 330 local police officers who act as collectors of statistics as required by the Victorian *Statistics Act* 1958. Statistics from these schedules are compiled for each county and municipality.

Every holding of 1 acre and upwards used for the production of agricultural products or for the raising of livestock and the production of livestock products is visited, and full particulars are obtained of the area occupied, the rural population, the number of persons employed, the area and yield of each kind of crop cultivated, artificial fertilizer usage, numbers of certain items of farm machinery, the number and description of livestock and the quantity of wool clipped.

Data relating to area sown, production, yield per acre, and number of holdings growing crops are for the season ended 31st March, thus including crops which are sown and harvested, or sown or harvested, during the twelve months ended 31st March.

In cases where harvesting of certain crops has not been completed by the 31st March (potatoes, fruit, vines, &c.) supplementary collections are made later in the year.

Livestock numbers, farm machinery on rural holdings, and the number of persons working are reported at 31st March, whilst wage and salary payments relate to the twelve months ended 31st March.



Land Occupied in Different Districts. 1959-60

For the season 1959-60, the number of occupiers of rural holdings was 69,778, the area devoted to agriculture 6,663,023 acres, and the total area occupied 37,736,530 acres.

It should be noted that statistics in this part of the Year Book have been compiled for statistical districts, which are groups of counties, namely, land areas with immutable boundaries. A map defining the boundary of each statistical district appears on the opposite page.

VICTORIA—LAND IN OCCUPATION IN EACH DISTRICT, SEASON 1959-60

| Statistical Districts | | | Number | Acres Occupied | | | | | |
|---|---------------------------------------|--|--|--|---|---|--|--|--|
| | | Total Area of | | For | For P | asture | | | |
| | | Districts (Acres) | Holdings | Agricul- tural Purposes | Sown Grasses, Clover, or Lucerne | Natural Grasses | Unpro- ductive | Total | |
| | | '000 | No. | | | ' 000' | | | |
| Central North-Central Western Mallee Northern Gippsland | ••• | 4,065 2,930 8,775 7,395 10,784 6,337 7,221 8,739 | 14,475 4,423 12,753 6,128 6,299 11,538 5,057 9,105 | 394 116 475 1,736 2,443 1,118 160 221 | 1,110 393 3,385 1,431 464 1,227 615 1,109 | 900 1,409 2,121 2,311 3,748 2,948 1,885 1,085 | 287 176 562 546 860 183 1,034 1,284 | 2,691 2,094 6,543 6,024 7,515 5,476 3,694 3,699 | |
| Total . | | 56,246 | 69,778 | 6,663 | 9,734 | 16,407 | 4,932 | 37,736 | |
| | | | Perc | CENTAGE OF | Above to A | AREA OCCU | PIED | | |
| Central North-Central . Western . Mallee Northern . North-Eastern . Gippsland . | · · · | ··· ·· ·· ·· | ··· ·· ·· ·· | $ \begin{array}{r} 14.63 \\ 5.53 \\ 7.27 \\ 28.81 \\ 32.51 \\ 20.42 \\ 4.34 \\ 5.96 \\ \end{array} $ | 41 · 24 18 · 79 51 · 73 23 · 76 6 · 18 22 · 41 16 · 65 29 · 98 | 33 · 45 67 · 26 32 · 41 38 · 37 49 · 87 53 · 84 51 · 02 29 · 34 | $ \begin{array}{r} 10.68 \\ 8.42 \\ 8.59 \\ 9.06 \\ 11.44 \\ 3.33 \\ 27.99 \\ 34.72 \\ \end{array} $ | $ \begin{array}{c} 100 \cdot 00 \\ \end{array} $ | |
| Total . | | •• | | 17.66 | 25.79 | 43.48 | 13.07 | 100.00 | |
| | | | PERCENT | AGE IN EAG | CH DISTRICT | OF TOTAL | IN STATE | | |
| Central | · · · · · · · · · · · · · · · · · · · | $7 \cdot 23$ $5 \cdot 21$ $15 \cdot 60$ $13 \cdot 14$ $19 \cdot 17$ $11 \cdot 27$ $12 \cdot 84$ $15 \cdot 54$ | 20 · 74 6 · 34 18 · 28 8 · 78 9 · 03 16 · 53 7 · 25 13 · 05 | 5 · 91 1 · 74 7 · 13 26 · 05 36 · 67 16 · 78 2 · 41 3 · 31 | $11 \cdot 40 \\ 4 \cdot 04 \\ 34 \cdot 78 \\ 14 \cdot 70 \\ 4 \cdot 77 \\ 12 \cdot 60 \\ 6 \cdot 32 \\ 11 \cdot 39$ | $5 \cdot 49 \\ 8 \cdot 59 \\ 12 \cdot 92 \\ 14 \cdot 09 \\ 22 \cdot 85 \\ 17 \cdot 97 \\ 11 \cdot 48 \\ 6 \cdot 61$ | 5.82 3.58 11.39 11.07 17.44 3.70 20.97 26.03 | 7 · 13 5 · 55 17 · 34 15 · 96 19 · 92 14 · 51 9 · 79 9 · 80 | |
| Total . | •• | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | |

(Areas of 1 acre and upwards)

Size of Holdings Showing Areas Cultivated and Grazed

A detailed cross classification of holdings by size and area of main crops or number of livestock is prepared approximately every five years. The following table shows some of the information, in summary form, from the last classification of this type taken at 31st March, 1956:—

| Size of Holdin (Including Cro Lands Held | ngs wn) | Number of Holdings | Area Occupied | Wheat, 1955–56 | Sheep Dairy Cattle | | Beef Cattle | Pigs |
|--|----------------|--------------------------|------------------|-------------------|-----------------------|-----------|----------------|---------|
| acres | | | acres | acres | No. | No. | No. | No. |
| 1- 99 | | 22,095 | 860,845 | 3,802 | 181,445 | 268,655 | 25,435 | 55,758 |
| 100- 199 | | 12,387 | 1,750,435 | 13,507 | 636,536 | 535,984 | 53,785 | 62,665 |
| 200- 299 | | 6,346 | 1,536,059 | 19,225 | 859,495 | 278,518 | 58,691 | 34,064 |
| 300- 399 | | 5,186 | 1,752,632 | 61,298 | 1,312,906 | 179,258 | 66,827 | 20,899 |
| 400 499 | | 3,344 | 1,488,982 | 64,454 | 1,277,891 | 98,744 | 61,857 | 13,804 |
| 500- 999 | •• | 11,190 | 7,887,925 | 607,475 | 6,793,088 | 185,078 | 231,095 | 21,999 |
| 1,0001,399 | | 3,614 | 4,256,983 | 414,042 | 3,076,428 | 43,808 | 99,623 | 5,829 |
| 1,400–1,999 | | 2,445 | 4,041,291 | 361,697 | 2,896,267 | 22,829 | 83,133 | 3,006 |
| 2,000–2,999 | •• | 1,468 | 3,505,790 | 288,140 | 2,237,791 |] | 74,912 |] |
| 3,000-4,999 | | 908 | 3,369,086 | 219,284 | 1,933,920 | } 25,880 | 65,797 | } 3,577 |
| 5,000 and over | ••• | 545 | 7,406,447 | 88,486 | 2,082,936 | 7,549 | 124,581 | 1,212 |
| Total | | 69,528 | 37,856,475 | 2,141,410 | 23,288,703 | 1,646,303 | 945,736 | 222,813 |

VICTORIA—SIZE OF HOLDINGS SHOWING AREAS UNDER WHEAT AND STOCK DEPASTURED, 31st MARCH, 1956

Artificial Fertilizers

In 1959-60 artificial fertilizers were used on 2,273,647 acres of wheat; 1,036,263 acres of other cereal crops; 81,612 acres of vegetables; 92,553 acres of orchards; 594,931 acres of other crops (including grass and clover hay); and 9,153,030 acres of pastures. Superphosphate is the main fertilizer used on both crops and pastures and in 1959-60 amounted to 175,895 tons or 81 per cent. of the total artificial fertilizer used on all crops and 495,553 tons or 95 per cent. of that used on pastures.

A summary of the area fertilized, quantity used, and number of holdings on which artificial fertilizers were used is shown below for each of the years 1955-56 to 1959-60:—

| | | Crops | | Pastures | | | |
|---------|----------|------------|-----------|----------|------------|-----------|--|
| Year | No. of | Area | Quantity | No. of | Area | Quantity | |
| | Holdings | Fertilized | Used | Holdings | Fertilized | Used | |
| | | '000 acres | '000 tons | | '000 acres | '000 tons | |
| 1955–56 | 34,907 | 3,500 | 174 | 40,256 | 8,537 | 480 | |
| 1956–57 | 34,454 | 2,906 | 151 | 41,659 | 8,729 | 494 | |
| 1957–58 | 41,167 | 3,690 | 191 | 43,234 | 9,684 | 548 | |
| 1958–59 | * | 4,580 | 229 | 40,452 | 8,925 | 502 | |
| 1959–60 | 40,460 | 4,079 | 217 | 38,327 | 9,153 | 523 | |

VICTORIA—ARTIFICIAL FERTILIZERS

Not available.

Aerial Agriculture

During recent years aircraft have been used for topdressing and seeding pastures and for spraying and dusting crops and pastures. Since 1956-57 statistical information has been collected by the Department of Civil Aviation and details are shown in the following table:—

| Particulars | Unit | 1956-57 | 1957-58 | 1958–59 | 1959-60 |
|---|-------------|-----------------------|-------------------|----------------------------|-------------------------|
| Total Area Treated* | acres | 230,781 | 339,019 | 408,745 | 506,821 |
| Topdressing and Seeding Area Treated— | | | | | |
| Superphosphate Seed Other | acres | 164,326 16,642 | 252,311 35,500 | 252,529 10,336 1,360 | 370,597 1,200 800 |
| Total Area Treated [†] | ,, | 164,326 | 253,596 | 253,489 | 372,597 |
| Materials Used— Superphosphate Seed | tons lb. | 11,745 4,940 | 17,065 7,240 | 15,895 8,320 | 22,976 24,000 |
| Spraying and Dusting Area | | | | | |
| Insecticides | acres | 9,826 | 51,813 | 82,740 | 73,129 |
| Herbicides | ,, ,, | 57,644 | 2,200 32,713 | 600 75,747 | 67,556 |
| Total Area Treated [†] | ,, | 66,455 | 85,423 | 155,256 | 134,561 |

| VICTORIA—AERIAL | AGRICULTURE |
|-----------------|-------------|
|-----------------|-------------|

 \ast Excludes dingo baiting operations, areas baited for rabbit destruction, and mosquito eradication.

† Areas treated with more than one type of material in one operation are counted once only.

Mechanization of Farming

Harvesting

The first settlers in Victoria brought with them the simple equipment they used in Britain—single furrow ploughs, peg tooth harrows, the scythe, the sickle, and the flail. By the 1840's, the most urgent problem, in what was becoming a commercialized industry, was how to gather the wheat harvest without a horde of men and scythes. This was successfully met in 1844 by the invention of Ridley's stripper in South Australia, accompanied by the hand winnower to complete the job and was only a decade after McCormick's reaper (i.e. the mower) in the United States of America, and forty years ahead of the American twine reaper and binder.

By that time (c. 1885) Hugh Victor McKay in Ballarat had, by combining the winnower with the stripper, made a 'complete' harvester. Though 'Combine' reaper-thrashers were coming into use in America by the 1900's, the modern Australian variety stems from a local development of the same theme about 1912. Though the harvesting end of the wheat cycle up to bulk handling has been mechanized in these successive steps over a century and more, the cultivation of the crop went more slowly.

Cultivation

Not until the 1880's, with the "discovery" of the value of superphosphate and of bare fallows, and the extension of cropping into the lighter soil types, did we see the use of 3 and 4 furrow ploughs, with shorter mouldboards and shallower working than the traditional English styles.

The universal use of superphosphate called for a drill that sowed the superphosphate with the seed; the fallowing principle called for a telescoping of the sowing with cultivation, leading to the "combine" drill cultivator.

By the turn of the century, Australian wheat farmers, masters in the control of large teams of horses, were covering broad acres with wide ploughing and tillage tools.

Clearing

The ever widening expansion of the wheat areas into uncleared land was confronted not only by the greater cost of clearing but the increasing hindrance to cultivation imposed by the tree roots. The root problem in ploughs was met, around 1876, by Smith's stump-jump principle, which soon was applied also to the tine cultivators, and later to the disc implements. Stump-jump implements were an essential element in the attack on the Mallee scrub, when these areas were invaded in the 1890's and over the next 30 years. The other aspect of this attack was the Mallee roller, followed by fire. The essentials of these methods are still followed in the modern highpower clearing for closer settlement.

Mechanical Power

Though large scale ploughing with steam traction engines and cable gear was used in England and ' abroad ' in the 1860's, the method was not significantly employed in Australia. The application of mechanical power to the towing of the implements and machines of agriculture in Australia had to await the development of the tractor with its light weight high speed engine; the First World War had shown these to be feasible and reasonably successful.

Even then, the farmers of the depression years were in no mood to accept these new things wholeheartedly: they knew and preferred their horses, which, anyway, cost less to breed and to maintain.

But with the flexibility and economy acquired by the tractor with pneumatic tyres, and the pressure of work during the war years and the post-war prosperity, the old order gave way to the new, especially when sons, experienced in the machines of war, returned with new knowledge to the pursuits of farming in peace. Today the tractor, with its several power outlets, wide range of speeds, pneumatic tyres and hydraulic lifts and controls, is as essential to farming as the tools it works; it is equally essential to graziers in their raising and storing of fodder for their stock.

Electrical Power

On the other hand, in the closer settled areas, electricity has come to be the preferred source of stationary power, supplanting the engine and often the windmill. Electricity in the dairying areas not only drives the milking machine, and lights the shed; it heats the wash-up water, and in growing measure cools the milk for bulk collection. The milking machine itself is worth noting as a remarkably successful mechanical treatment of a biological process.

The number of the principal items of farm machinery on rural holdings at the 31st of March during each of the past five years are given in the table below:—

VICTORIA—FARM MACHINERY ON RURAL HOLDINGS

| B (1.1 | Number at 31st March- | | | | | |
|------------------------------------|-----------------------|--------|--------|--------|--------|--|
| Particulars | 1956 | 1957 | 1958 | 1959 | 1960 | |
| Milking Machines—Units | 77,602 | 81,729 | 83,819 | 85,608 | 89,657 | |
| Shearing Machines-Stands | 32,245 | 34,884 | 34,955 | 35,951 | 37,015 | |
| Tractors—Wheeled Type | 49,584 | 52,275 | 55,263 | 57,818 | 59,438 | |
| -Crawler Type | 1,645 | 1,621 | 1,652 | 1,684 | 1,730 | |
| Rotary Hoes | 9,749 | 9,166 | 8,777 | 9,429 | 9,180 | |
| Fertilizer Distributors and Broad- | , | , | , | | , | |
| casters | 26,470 | 27,336 | 26,692 | 27,290 | 27,948 | |
| Grain Drills-Combine | 19,994 | 19,363 | 18,360 | 19,428 | 18,517 | |
| Other | 8,209 | 8,206 | 8,531 | 8,525 | 9,531 | |
| Maize Planters | 1,050 | 1,041 | 972 | 1,020 | 998 | |
| Headers, Strippers and Harvesters | 14,168 | 13,722 | 13,641 | 13,507 | 14,216 | |
| Pick-up Balers | 5,055 | 5,468 | 6,173 | 7,073 | 8,040 | |
| Stationary Hay Presses | 3,371 | 3,077 | 2,658 | 2,518 | 2,465 | |

NOTE,-Details of items which have not been collected since 1955 are published in the Victorian Year Book 1954-58, page 88.

Rural Finance Corporation

The Corporation was established in April, 1950. Its objects, which are set out in section 5 of the *Rural Finance Corporation Act* 1958, include the making of advances by way of loan at low rates of interest to existing or proposed country industries, both primary and secondary. The Corporation is the successor in law of the Farmers' Debts Adjustment Board and is empowered to advance moneys to, or for the benefit of, any farmer for the purpose of carrying into effect a composition or scheme of arrangement between him and his creditors.

Revenue, expenditure, &c., of the Corporation for each of the five years 1955-56 to 1959-60 is given in the following table:—

VICTORIA—RURAL FINANCE CORPORATION : REVENUE, EXPENDITURE, ETC.

(£'000)

| | Particulars | | 1955–56 | 1956–57 | 1957–58 | 1958–59 | 1959-60 |
|-------------------|-------------|----|--------------|----------|----------|----------|-----------|
| Interest Other | Revenue | •• | 248 5 | 283 6 | 337 5 | 381 7 | 405 10 |
| | Total Reven | ue | 253 | 289 | 342 | 388 | 415 |

| Particulars | 1955–56 | 1956–57 | 1957–58 | 1958–59 | 1959–60 |
|-------------------------|-----------------|----------------|----------------|-----------------|----------------|
| Expenditure | 29 | 41 | 47 | 49 | 54 |
| Interest | 138 16 22 | 167 18 7 | 202 23 8 | 250 19 21 | 261 20 9 |
| Total Expenditure | 214 | 233 | 280 | 339 | 344 |
| Net Surplus | 39 | 56 | 62 | 49 | 71 |
| at 30th June | 6,915 | 7,559 | 8,147 | 8,611 | 8,731 |
| Government at 30th June | 5,668 | 6,557 | 7,223 | 7,734 | 7,836 |

VICTORIA—RURAL FINANCE CORPORATION : REVENUE, EXPENDITURE, ETC.—continued

Progress of Cultivation

The first Statistical Register of Victoria published in 1854 shows that in 1836 there were 50 acres of land under cultivation in the colony of Victoria. By the year 1840 this figure had increased to 3,210 acres. This progress continued until 1852 when 57,472 acres were under cultivation. With the discovery of gold in Victoria, agricultural progress received a temporary setback, the area of land cultivated declining to 34,816 acres in 1854. However with the influx of population came a demand for agricultural products and, by the end of 1860, the area of land under cultivation amounted to 407,740 acres.

The following table shows the area under cultivation at decennial intervals from 1856 to 1955 and for each of the following five seasons 1956 to 1960:—

| Per | iod or 1 | Year (Ende | d March) | Annual Aver 1856–1955, 19 | age Area in Eacl and Actual Area 56–1960, under— | h Decennium, Each Year | |
|-----------|---------------------------|------------|----------|---------------------------------|--|---------------------------|----------------------|
| | Tenner of Tear (Ended Was | | | | Crop | Fallow | Total Cultivation |
| | | | | | acres | acres | acres |
| 1856-65 | | | | | 325,676 | 12,146 | 337.822 |
| 186675 | | | •• | | 624.377 | 57,274 | 681,651 |
| 187685 | | | | | 1.306.920 | 137,536 | 1.444.456 |
| 1886-95 | | | | | 2,109,326 | 364,282 | 2,473,608 |
| 1896-1905 | | | | | 3,022,914 | 524,197 | 3,547,111 |
| 1906–15 | | | | | 3,756,211 | 1,276,148 | 5,032,359 |
| 1916-25 | | | | | 4,594,244 | 1,852,145 | 6,446,389 |
| 1926–35 | •• | | | | 5,233,894 | 2,501,357 | 7,735,251 |
| 1936–45 | | •• | | | 4,435,645 | 2,142,953 | 6,578,598 |
| 1946–55 | •• | | | | 4,635,982 | 2,311,401 | 6,947,383 |
| 1956 | | | | | 4,542,096 | 1,982,742 | 6,524,838 |
| 1957 | | | | | 3,637,352 | 1,879,812 | 5,517,164 |
| 1958 | •• | | | | 4,051,249 | 1,644,764 | 5,696,013 |
| 1959 | | | | | 4,790,989 | 2,187,212 | 6,978,201 |
| 1960 | | | | | 4,482,757 | 2,180,266 | 6,663,023 |

VICTORIA—ACREAGE CULTIVATED ANNUALLY

Crops and Growers

The following table shows the area under, the yield from, and the gross value of each of the principal crops in Victoria for the season 1959-60:—

| ···· | | | | - | | | | | |
|--------------------|----------|----|-----|-----------|------------|------------|---------|-----|-----------------|
| C | rop | | | Area | | Yield | | | Gross Value* |
| Cereals for Grain- | - | | | acres | | | | | £ |
| Barley_ | | | | 062 721 | 6 210 404 | L | | | 2 544 652 |
| 2 row | • • | •• | •• | 263,731 | 5,318,404 | bushels | • • | · • | 2,344,032 |
| Maiza | • • | •• | •• | 13,870 | 2/4,441 | bushels | • • | •• | 121 267 |
| Oats | • • | •• | •• | 672,002 | 12 701 020 | bushels | • | •• | 4 797 282 |
| Rve | •• | •• | •• | 22 344 | 138 438 | bushels | •• | •• | 88,831 |
| Wheat | | •• | | 2,260,730 | 38,792,616 | bushels | | | 26,743,415 |
| ¥ | | | | | | | | | |
| Rarley and Dye | | | | 2 761 | 2 404 | tons | | | 34 530 |
| Lucerne | | •• | •• | 61 443 | 115 831 | tons | • • | •• | 1 576 493 |
| Meadow | | | ••• | 534 285 | 855 379 | tons | ••• | ••• | 8,937,462 |
| Oaten | | | | 207,351 | 320,343 | tons | | | 3,458,960 |
| Wheaten | | •• | | 41,708 | 55,956 | tons | | | 576,106 |
| Green Fodder | | | | 88 443 | | | | | 653 161 |
| Crew and Other E | | •• | •• | 00,443 | | | •• | •• | 603,101 |
| Orey and Other Fi | eld Peas | | ••• | 19,146 | 403,613 | bushels | •• | •• | 002,820 |
| Grass and Clover S | Seed | | | 17,724 | 17,663 | cwt. | | •• | 317,715 |
| Industrial Crons- | | | | | | | | | |
| Broom Millet | | | | 239 | { 1,160 | cwt. fibre | • | •• | 8,922 582 |
| Linseed | | | | 24 850 | 295 644 | bushels | | •• | 535.089 |
| Hops | | | ••• | 466 | 6 788 | cwt. | | | 283,498 |
| Mustard | | | ••• | 1 026 | 4 115 | cwt. | ••• | | 26,404 |
| Tobacco | •• | | | 6,424 | 66,080 | cwt. | | •• | 4,146,258 |
| Variables | | | | | | | | | |
| Opions | | | | 2 00 4 | 27 909 | 40.00 | | | 1 012 002 |
| Potatoes | •• | •• | •• | 3,994 | 27,000 | tons | •• | •• | 5 808 377 |
| Other | •• | •• | •• | 46,300 | 242,340 | tons | • • | •• | 9 342 151 |
| | • • | •• | •• | 55,211 | 209,705 | 10113 | •• | •• | 2,042,101 |
| Stock Fodder- | | | | | | | | | |
| Pumpkins | • • | | | 1,524 | 3,401 | tons | | •• | 54,416 |
| Turnips, Beet, & | с. | | •• | 32,182 | 50,776 | tons | •• | •• | 558,536 |
| Vinevards— | | | | | [| | | | |
| Grapes- | | | | | | | | | |
| Table | | | | 1.790 | 6.082 | tons | | | 349,107 |
| Wine | | | | 4,250 | 9,445 | tons | | | 203,120 |
| Drying | | | | 36,204 | 195,908 | tons proc | lucing- | | |
| | | | | · · | 38,652 | tons of s | ultanas | | 5,425,894 |
| | | | | | 6,113 | tons of r | aisins | •• | 868,319 |
| Vines, Unproduct | tive | | | 1.885 | 3,331 | tons of c | urrants | •• | 487,411 |
| , | | | | 1,000 | | | | | |
| Orchards— | | | | | | | | | |
| Productive | | | | 46,918 | | | | | 10,529,869 |
| Unproductive | | | ••• | 21,649 | | •• | | •• | ••• |
| | | | | | | | | | 2 200 501 |
| All Other Crops | | •• | •• | 5,718 | | | •• | ••• | 2,209,381 |
| Total Crop | os | •• | •• | 4,482,757 | | | | •• | 92,410,896 |

VICTORIA—AREA, YIELD, AND GROSS VALUE OF CROPS, 1959–60

* The gross value is based on the wholesale price realized in the principal markets. The places where primary products are absorbed locally or where they become raw materials for a secondary industry, are presumed to be the principal markets.

The following table shows the numbers of growers of certain primary products, in each statistical district of the State, for the season 1959-60.

The information has no relation to the number of rural holdings in the State, as numbers of occupiers are engaged in the cultivation of more than one of the crops enumerated.

VICTORIA---GROWERS OF CERTAIN CROPS, SEASON 1959-60

| | | 0 | Growers | in Each | Statistica | 1 Distric | t | | |
|---------------|---------|-------------------|--------------|--------------|------------|---------------|------------------------|----------------|--------|
| Crops Grown | Central | North- Central | West- ern | Wim- mera | Mallee | North- ern | North- East- ern | Gipps- land | Total |
| Grain Crops- | | | | | | | | | |
| Wheat . | . 538 | 325 | 751 | 3,676 | 2,595 | 3,267 | 437 | 52 | 11,641 |
| Oats., . | . 555 | 475 | 1,386 | 2,401 | 1,468 | 2,312 | 586 | 68 | 9,251 |
| Barley . | . 654 | 101 | 365 | 787 | 1,007 | 768 | 99 | 89 | 3,870 |
| Maize . | . 3 | 1 | | | · | | 47 | 170 | 221 |
| Green Fodder- | | | | | | | | | |
| Maize . | . 556 | 53 | 300 | 5 | 4 | 21 | 57 | 744 | 1,740 |
| Lucerne . | . 69 | 40 | 99 | 27 | 35 | 73 | 31 | 52 | 426 |
| Millet . | . 344 | 50 | 232 | 15 | 55 | 340 | 268 | 481 | 1,785 |
| All Other . | . 424 | 173 | 618 | 30 | 9 | 81 | 105 | 387 | 1,827 |
| Other— | | | | | | | | | |
| Potatoes . | . 1,874 | 519 | 792 | 19 | 21 | 18 | 177 | 587 | 4,007 |
| Onions . | . 300 | | 288 | 6 | 10 | 7 | | 6 | 617 |
| Other Vege- | | | | | | | | | |
| table | s 1,334 | 24 | 202 | 56 | 361 | 559 | 32 | 100 | 2,668 |
| Orchards . | . 1,994 | 167 | 125 | 149 | 1,251 | 1,093 | 202 | 95 | 5,076 |
| Vineyards . | . 6 | 1 | | 10 | 2,375 | 90 | 23 | | 2,505 |
| Grass and | | | | | | | | | } |
| Clover See | d 20 | 53 | 109 | 19 | 11 | 72 | 57 | 9 | 350 |
| Tobacco . | . | | l | 2 | 3 | 55 | 228 | | 288* |

* Excluding share-farmers.

A summary of the area under cultivation in each statistical district of the State for the season 1959-60 is given in the following table:----VICTORIA-AREA UNDER CULTIVATION, SEASON 1959-60 (Acres)

| | Statistical District | | | | | | | | | | |
|-------------------------------------|----------------------------|---------------------------|----------------------------|------------------------------|-------------------------------|------------------------------|---------------------------|-------------------------|---------------------------------|--|--|
| Crop | Cen- tral | North- Cen- tral | West- ern | Wim- mera | Mallee | North- ern | North- East- ern | Gipps- land | Total | | |
| Grain Crops- | | | | | | | | | | | |
| Wheat Oats Barley | 31,234 19,098 39,158 | 16,232 17,684 2,783 | 48,175 75,525 12,334 | 726,725 178,028 57,124 | 963,512 219,443 125,713 | 435,209 142,905 35,685 | 37,487 17,757 2,251 | 2,156 2,562 2,553 | 2,260,730 673,002 277,601 | | |
| Maize Field Peas All Hay | 25 10,442 135,158 | 5 781 44,114 | 7,203 199,264 | 64,560 | 137 24,312 | 38 165,158 | 348 133 69,985 | 3,005 329 144,997 | 3,383 19,146 847,548 | | |
| Grass and Clover for Seed | 1,069 | 2,290 | 24,353 5,659 | 2,063 1,010 | 4,528 | 3,666 | 6,564 2,144 5,174 | 19,438 251 | 88,443 17,724 6 424 | | |
| Potatoes Onions All Other | 26,220 1,458 | 7,523 | 7,903 2,428 | 53 6 | 128 18 | 67 35 | 978 | 5,634 49 | 48,506 3,994 | | |
| Vegetables Vines Orchards | 20,295 8 23,576 | 66 35 2,584 | 4,458 | 212 663 3,998 | 3,556 41,309 6,545 | 5,294 672 29,164 | 167 1,442 1,631 | 1,163 364 | 35,211 44,129 68,567 | | |
| All Other Crops Total Area under | 10,814 | 1,456 | 40,018 | 877 | 22,064 | 3,184 | 1,900 | 8,036 | 88,349 | | |
| Crop Land in Fallow | 335,473 58,237 | 100,732 15,138 | 428,025 47,341 | 1,035,415 700,543 | 1,412,959 1,030,313 | 831,655 286,467 | 147,961 12,363 | 190,537 29,864 | 4,482,757 2,180,266 | | |
| Total Area under Cultivation | 393,710 | 115,870 | 475,366 | 1,735,958 | 2,443,272 | 1,118,122 | 160,324 | 220,401 | 6,663,023 | | |

The following table shows the yields, in statistical districts, of the principal crops for the season 1959-60:---

| | | Statistical District | | | | | | | | | | | |
|---------------|--------------|------------------------|--------------|--------------|------------|---------------|------------------------|----------------|------------|--|--|--|--|
| Сгор | Cen- tral | North- Cen- tral | West- ern | Wim- mera | Mallee | North- ern | North- East- ern | Gipps- land | Total | | | | |
| Grain Crons- | | | | | | | | | | | | | |
| Wheat hush | 802 538 | 440 055 | 1 285 208 | 13 871 622 | 10 725 665 | 10.611.872 | 992,905 | 62,751 | 38.792.616 | | | | |
| Oats | 606,540 | 520,547 | 2,824,348 | 3,163,448 | 1,451,555 | 3,549,388 | 527,881 | 57.322 | 12,701,029 | | | | |
| Barley | 1.664.976 | 94.532 | 420.728 | 845,203 | 1.507.721 | 897.844 | 69.543 | 92,298 | 5,592,845 | | | | |
| Maize | 1.245 | 100 | | | | | 12,658 | 166,451 | 180,454 | | | | |
| Field Peas | 215,431 | 17,419 | 149,714 | | 11,340 | 905 | 1,665 | 7,139 | 403,613 | | | | |
| All Hay tons | 230,752 | 70,355 | 296,305 | 76,494 | 22,242 | 261,370 | 130,332 | 263,153 | 1,351,003 | | | | |
| Grass and | - | | | | - | - | | | | | | | |
| Clover for | | | | | | | | | | | | | |
| Seed cwt. | 893 | 2,552 | 6,663 | 507 | 1,744 | 4,158 | 1,037 | 109 | 17,663 | | | | |
| Tobacco " | | 22.005 | a | 10 | 368 | 11,821 | 53,881 | 00.000 | 66,080 | | | | |
| Potatoes tons | 137,710 | 33,805 | 37,583 | 217 | 601 | 330 | 2,777 | 29,525 | 242,548 | | | | |
| Unions " | 9,330 | | 17,748 | 42 | 124 | 214 | •• | 350 | 27,808 | | | | |
| wine made | | | | * | • | * | * | | 2 146 676 | | | | |
| Dried Vine | | | •• | • | | | - | •• | 2,140,070 | | | | |
| Fruits_ | | | | | | | | | | | | | |
| Raising tons | | | | | 6 098 | 15 | | | 6.113 | | | | |
| Sultanas | | | | | 38,652 | | | | 38,652 | | | | |
| Currants | | | | | 3.331 | | | | 3,331 | | | | |
| | | | 1 | | 2,001 | | | | -, | | | | |

VICTORIA—YIELDS OF PRINCIPAL CROPS, SEASON 1959-60

* Details for individual districts are confidential.

General

Principal Crops

The cereals wheat, oats, and barley are the principal crops grown in Victoria and these, together with hay, represent about 90 per cent. of the total area sown, although there is some variation from year to year. The growing of potatoes, grapes, and apples is also important.

In the following section some detailed descriptive and statistical information is given for all main crops grown in the State including those mentioned above.

Wheat

Wheat is the main crop grown in Victoria, occupying approximately $2\frac{1}{2}$ million acres or about half the total acreage under crop. The average annual production is about 44 million bushels, of which 60 per cent. is exported. Only 2 per cent. of the area sown is cut for hay. Grain yield averages 20 bushels per acre, but can be as high as 60 bushels per acre on individual farms in good seasons. The highest yield officially recorded is $78 \cdot 8$ bushels per acre for 50 acres grown at Murtoa in 1960.

The main wheat belt lies in the Mallee, Wimmera, and Northern Districts, where 95 per cent. of the crop is grown. The average annual rainfall varies from 11 inches in the northern Mallee to about 20-22 inches at the southern and eastern boundaries.

Wheat is grown in three major soil types: (1) the high-fertility, self-mulching, grey soils of heavy texture in the southern Wimmera; (2) red-brown earths of varying texture in the northern Wimmera and the Northern District; and (3) solonized brown soils in the Mallee.

C.2323/61.--17

Sheep are run on most wheat farms for wool and/or fat lamb production. Wheat crops are generally grown on bare fallow land, seeding taking place from April to June, Superphosphate is applied at seeding to virtually all crops. The crop is harvested in December-January. Diseases are not a major problem, but occasionally some heavy losses can occur due to stem rust and root rots. Weeds are controlled by fallow, cultivation and crop spraying.

The wheat varieties grown in Victoria are of the soft white class. The environment does not generally favour the production of wheat of very high baking quality, but recent developments, including the adoption of clover and medic ley rotation systems and the production of high yield, high quality varieties, are leading to considerable quality improvement.

Victorian wheat is marketed by the Australian Wheat Board in one grade known as fair average quality (f.a.q.).

Legume Pastures in the Wheat Belt of Victoria

Over the years since 1880, when research first demonstrated that increased yields were obtained when wheat crops were sown on fallowed land, the accepted rotation on most wheat lands of Victoria has been fallow—wheat, or fallow—wheat—oats.

There has been increasing evidence in recent years that this intensive cropping programme has lowered the organic matter content of soils treated in this manner with a resultant decrease in the protein content of the wheat grain.

Research investigations have shown that for the maintenance of soil fertility, it is desirable to widen the wheat rotation to include a grazed pasture preferably containing a legume. This is a relatively simple matter in the higher rainfall areas of the eastern portion of the Northern District wheat belt where soils are more acidic in nature and where subterranean clover grows prolifically. In such areas "clover ley" has been accepted as part of the normal wheat rotation with material benefit to the farmer in increased yields of wheat and improved protein content of the grain.

In the more alkaline soils of the Mallee and Wimmera, with their lighter rainfall, subterranean clover has not proved a satisfactory pasture legume and research workers of the Department of Agriculture have been seeking for a legume to replace subterranean clover in the wheat rotation.

Investigations at the Mallee Research Station, Walpeup, have now shown that even in the twelve inch rainfall belt of this region, lucerne (*Medicago sativa*) and barrel clover (*Medicago tribuloides*) can be satisfactorily grown as pasture legumes in a wheat rotation with material benefit to the cereal crop. Not only has adoption of this practice been of benefit to the wheat crop, but it is playing a major part in controlling wind erosion of the sandy soils of the region. Subsequent Departmental research in the Wimmera has demonstrated the success of these legumes in the alkaline red and black soils of the Wimmera region also. This has been of particular importance since the continued intensive cropping of the high priced self-mulching soils of the Wimmera over a considerable number of years has had a marked effect in reducing the protein content of much of the wheat produced from this region.

As a result of these findings, wheat farmers in the Mallee and Wimmera have modified their agricultural practices materially in the last few years. Whereas prior to 1950, the general appearance of the countryside was an alternation of crop, fallow, and rather sparse natural pasture, ten years later pastures sown to medic clovers and lucerne have replaced large areas of natural pasture and are a main feature of the landscape. In many districts, the area of lucerne and barrel medic is even greater than the area sown to wheat.

These changes are demonstrated by the statistical figures which have been collected in the various districts. For instance, the area recorded as sown to pasture other than lucerne in the Wimmera has risen from about 422,000 acres in 1948 to about 1,415,000 acres by 1958, and in the Mallee from about 89,000 acres in 1954 to 359,000 acres by 1959. This increase has been due largely to increased sowings of barrel and burr medics.

Although the total area sown to lucerne in these districts does not approach that sown to the medic clovers, there has been a major change, particularly in the Mallee, in the acreage sown to this pasture legume over the past six years. Thus while the lucerne acreage was only 4,300 acres in 1954, it had increased to 84,000 acres by 1960.

Fig. 12 shows the change in acreage sown to lucerne and to pasture other than lucerne for the years 1948 to 1960 for the three districts, the Mallee, the Wimmera and the Northern District. In all three districts there has been a material increase in the overall area sown to improved pastures containing a legume.

In the Wimmera and the Northern District, on the one hand, the increase has been mainly in the area sown to clovers and this has been proceeding rapidly and consistently since the end of the Second World War.

In the Mallee, on the other hand, the rapid change in the rate of increase in the use of legumes in pastures did not occur until 1954 when the importance of the new medic clovers began to be fully appreciated by farmers of this district. At the same time the particular value of the deep rooting, perennial lucerne in the sandy soils of the Mallee has resulted in an outstandingly rapid increase in the acreage sown for grazing in this region.

With the development of still better strains of clovers for the wheat belt of Victoria, the increase in areas sown to improved pastures can be expected to continue with beneficial results both in the numbers of stock that can be carried on the wheat farms and in the improvement that will follow in yield and quality of the wheat grown on those farms.



FIGURE 12.-Graph showing types of pastures sown in Wimmera and Mallee.

Grain Elevators Board

In 1934, an Act was passed to provide for the handling of wheat in bulk in Victoria. The Act gave the Government power to constitute a Board of three members to implement the provisions of the Act. On submissions made by the Board to, and approved by, the Government, 187 country receiving elevators and a shipping terminal have been constructed, the necessary finance being obtained from loans totalling £3,806,015. Repayment of the principal and interest are guaranteed by the Victorian Government.

The Grain Elevators Board first received and shipped Victorian wheat in bulk for the 1939-40 season.

Prior to the introduction of bulk handling by the Grain Elevators Board, many wheat growers had opposed that method of handling their wheat. One season of operation of the Board's bulk handling system in any wheat producing area was sufficient to allay the fears of those growers and prove to them that the bulk handling system not only saved labor on the farms, but materially reduced the overall handling costs for wheat.

The Board's Geelong Terminal is the most modern and the largest single wheat shipping terminal in the world. Its operation is by push-button remote control with operational indicator lights appearing on a diagram panel of the whole terminal. Wheat can be received from rail trucks at the rate of 1,200 tons per hour and can be shipped from the terminal at the rate of 1,600 tons per hour, either direct from the terminal storage bins or by a combination of storage bins and rail receivals.

The Grain Elevators Board claims that wheat is taken off the farms by the Board in a shorter period and handled at a lower cost per bushel than is achieved by any other wheat bulk-handling system in Australia or anywhere throughout the world.

The use of the tractor as well as the introduction of more modern harvesting machinery now permits growers to harvest wheat with moisture considerably in excess of that which was possible when they had to rely on horses to haul their harvesting machines. Deterioration of wheat in store, because of high moisture content, has brought home to wheat growers the fact that, when they deliver their wheat, each matured grain contains a series of living organisms which need only the required percentage of moisture to enable them to begin their reproductive cycles.

It is now also appreciated that a smaller percentage of moisture than that which is required for germination of the grain will bring about deterioration of the matter in the grain and that too much moisture will, likewise, adversely affect the reproductive organisms within the grain. The percentage of moisture which has those varying effects upon the matter within the grain has made it necessary to find an easy means of determining the moisture present in a quantity of wheat at any time. Engineers have already produced the tractor and the modern machinery which permit the harvesting of high-moisturecontent wheat and have now produced a simple moisture meter which indicates when the sun and wind have reduced the moisture content in the wheat to the percentage that enables the wheat to be harvested and stored with safety.

In addition to erecting its own country receival facilities, the Board has leased from country flour millers specified quantities of the storage constructed by millers.

The Grain Elevators Board has under its control storage for $71\frac{1}{2}$ million bushels of wheat. The largest quantity of wheat delivered to railway stations by Victorian growers in any one season prior to the 1960-61 season was 59,175,593 bushels in 1915-16. A new record was established during the 1960-61 season when 63,009,684 bushels were delivered.

The following statement shows the revenue and expenditure of the Grain Elevators Board in Victoria:—

VICTORIA—GRAIN ELEVATORS BOARD : REVENUE, EXPENDITURE, ETC.

(£'000)

| Benjadan | Year Ended 31st October- | | | | | | |
|--|---|--|---|---|--|--|--|
| Particulars | 1956 | 1957 | 1958 | 1959 | 1960 | | |
| Revenue | | | | | | | |
| Australian Wheat Board—Operating and Maintenance Expenses | 517 | 492 | 480 | 478 | 513 | | |
| Facilities Allowance | 244 43 | 262 59 | 312 53 | 342 63 | 350 90 | | |
| Other | | | 1 | 1 | | | |
| Total Revenue | 804 | 813 | 846 | 884 | 953 | | |
| Expenditure | | | | | | | |
| Operating and Maintenance Ex- penses | 348 93 75 137 27 82 7 | 310 99 83 167 31 110 4 | 268 119 93 177 31 113 7 | 281 101 96 178 32 131 7 | 291 107 114 188 34 147 7 | | |
| Total Expenditure | 769 | 804 | 808 | 826 | 888 | | |
| Net Surplus Fixed Assets (At 31st October) Loan Indebtedness (At 31st October)— | 35 3,283 | 9 3,860 | 38 4,064 | 58 4,229 | 65 4,425 | | |
| State Government | 972 2,321 | 965 2,808 | 955 2,774 | 946 2,838 | 935 3,195 | | |
Australian Wheat Board

With the inclusion of an additional member for Queensland, gazetted on 10th May, 1959, the Board now consists of the chairman and four other Commonwealth Government appointees, whilst the remaining ten members are representatives of wheat growers in the five main wheat growing States, each such State now being represented by two members.

The guaranteed price for wheat (which only applies to the volume of wheat used for human consumption in Australia plus 100 mill. bushels) of a particular season is an amount equal to the cost of production of wheat of that season as determined in accordance with the Commonwealth Stabilization Act. For the season 1959–60, it was fixed at 14s. 10d. per bushel and for season 1960–61 at 15s. 2d. per bushel. For each succeeding year of the Act, the cost of production will be determined by the Commonwealth Minister, after considering the report of the appropriate Committee on the variation in elements of costs and after consulting the appropriate Ministers of each State.

Total deliveries by wheat growers to the Australian Wheat Board during season 1959–60 were 37,098,828 bushels, including 1,592,340 bushels delivered to Victorian controlled receival points in southern New South Wales. Although the State yield was below average, it was a surprisingly good one in view of the dry autumn and winter which delayed sowing in the main wheat growing areas of the State, in some instances until mid August, and an unusually hot spell in November which adversely affected these late sown crops. The northeastern sector of the State received sufficient autumn and winter rains and crops were normal in that area, but on the other hand the northwest Mallee had its driest winter in 46 years.

Wheat Standard

The fair average quality (f.a.q) standard is fixed each season by a State Committee and is the basis for sales of each crop.

Samples of wheat from various districts are obtained each year and mixed to obtain a representative sample of the whole crop. The f.a.q. weight is then determined by use of the Schopper 1-litre scale chondrometer.

The f.a.q. standard method is peculiar to Australia, other countries selling according to sample or fixed grades.

The following table shows the standard determined in Victoria for each of the ten seasons, 1950–51 to 1959–60:—

| | Season | Weight of Bushel of Season Wheat, f.a.q. | | | | Weight of Bushel of Wheat, f.a.q. | |
|---------|--------|--|---------|----|----|---|--|
| | | lb. | | | | 1b. | |
| 1950-51 | | 62 1 | 1955-56 | | | 63 <u>3</u> | |
| 1951-52 | | 64 | 1956-57 | | | 65 <u>1</u> | |
| 1952–53 | | $64\frac{3}{4}$ | 195758 | | | 65 <u>1</u> | |
| 1953-54 | | 64 1 | 1958–59 | | | 64 | |
| 1954–55 | •• | 62 <u>1</u> | 1959-60 | •• | •• | 64 <u>*</u> | |

VICTORIA—WHEAT STANDARD

Area Sown, Production, and Gross Value

In the following table the area, production, average yield, and gross value of production of wheat for each of the seasons, 1955–56 to 1959–60 are shown:—

| Season | | | Area | Production | Average Yield | Gross Value |
|---------|--|------------|------------|--------------|------------------|----------------|
| | | | '000 acres | '000 bushels | bushels | £'000 |
| 1955–56 | | | 2,141 | 41,083 | 19 · 19 | 26,047 |
| 1956–57 | | | 1,565 | 35,282 | 22 · 54 | 24,041 |
| 195758 | | | 1,835 | 32,134 | 17.51 | 22,065 |
| 1958–59 | | | 1,810 | 42,697 | 23.59 | 28,274 |
| 1959–60 | | <u>.</u> . | 2,261 | 38,793 | 17.16 | 26,743 |

VICTORIA—WHEAT STATISTICS

Farmers Growing Wheat for Grain

The following statement shows the number of farmers engaged in growing wheat for grain :----

VICTORIA—NUMBER OF HOLDINGS WITH TWENTY OR MORE ACRES OF WHEAT FOR GRAIN

| 195556 | 1956-57 | 1957–58 | 1958–59 | 1959–60 | |
|--------|---------|---------|---------|---------|--|
| 9,683 | 7,674 | 8,856 | 9,074 | 11,641 | |

Wheat Breeding

The breeding of improved varieties of wheat for cultivation by the Victorian wheat grower is a function of the Victorian Department of Agriculture. The overall objective of the breeding work is to provide the grower with new varieties which will increase yields, reduce losses due to disease and drought and improve the milling and baking quality of the grain which he produces. The increased yields resulting from the introduction of these varieties assist in offsetting increased production costs and assure the grower of a higher monetary return from his crop, while the improved quality of the grain produced ensures a better demand for Victorian wheat both in local and oversea markets.

The Victorian wheat improvement programme is an extremely comprehensive one, involving the co-operation of the wheat breeders with the cereal agronomists, chemists, and plant pathologists of the Department of Agriculture.

The breeding work is organized on a regional basis with the State Research Farm at Werribee representing the central plant breeding station for Victoria. This farm is particularly well suited for the purpose because of the facilities it provides for laboratory and

506

glasshouse work; for the rapid development of hybrid material under controlled lighting conditions; and for the growing and observation of an extensive collection of wheat varieties gathered from all over the world for possible use as parents in the breeding programme. All artificial hybridization work is carried out at the State Research Farm, Werribee. Each year a large number of matings of selected parents is made and the progeny of these is grown in the glasshouses and breeding cages under conditions which enable several generations of plants to be raised in one year, thus resulting in an appreciable saving in the time required to breed a new variety.

The central breeding station is supplemented by a series of regional selection nurseries located at the Mallee Research Station, Walpeup; Longerenong Agricultural College in the Wimmera, and Dookie Agricultural College in the North-Eastern District. Crossbred material in the second and later generations is distributed to these nurseries in order that selection work may be carried out in the environment in which the new varieties will eventually be grown. Each year between 40,000 and 50,000 rows of new crossbred wheats are sown in the central and regional nurseries. These are all sown and harvested by hand, and are selected on the basis of desirable agronomic characters. superior milling and baking quality, and increased resistance to disease. The most promising of these are tested for a number of years in Departmental plots on the research stations and on farmers' properties at appropriate centres in the wheat belt to determine their yielding ability. During this period the grain of each crossbred is also subjected to milling and baking tests in the cereal laboratories of the Department of Agriculture.

Those crossbreds which demonstrate their superiority over existing varieties after being tested for yielding ability, grain quality characteristics, and disease resistance, become eligible for naming and release as new varieties. Before release, however, the new variety must be approved by the Victorian Wheat Advisory Committee consisting of representatives of the Department of Agriculture, the wheat growers, and the trade.

The results over a number of years from these tests form the basis of variety recommendations for different regions embracing areas of similar climatic and soil conditions. These recommendations are made at the annual meeting of the Victorian Wheat Advisory Committee.

For the 1961 seeding the recommendations were:-

Mallee

| Northern Insignia Olympic Beacon | Southern Insignia Olympic Beacon |
|---|---|
| Wimmera: | |
| Black Soils | Red and Fringe Soil |
| Olympic | Olympic |
| Pinnacle | Pinnacle |
| Stockade | Insignia |

| Northern: |
|--------------|
| Mid-Northern |
| Olympic |
| Insignia |
| |

East-Northern Olympic Sherpa

Southern:

| Western |
|----------|
| Olympic |
| Pinnacle |
| Sherpa |
| Insignia |

Central, North-Central, and Gippsland Olympic Pinnacle Sherpa Insignia

Rust-Resistant Variety : All districts, for circumstances where a rust-resistant variety is desired—Stockade.

New wheat varieties bred by the Department of Agriculture occupy a very large percentage of the Victorian wheat area and have significantly increased local production. This represents an increased monetary return to the wheat grower. In addition, the introduction of these varieties has resulted in a substantial improvement in the quality of the grain produced with a corresponding improvement in the baking quality of the local flour.

Seven new varieties have been released for sowing since 1946:-

| 1946—Insignia | 1953—Sherpa |
|---------------|---------------|
| 1946—Pinnacle | 1956—Olympic |
| 1947—Diadem | 1957—Beacon |
| | 1960—Stockade |

The following table shows the areas under the principal varieties of wheat, including wheat for hay, for the seasons, 1957–58, 1958–59, and 1959–60. Varieties are tabulated in order of popularity for the last-mentioned season.

| Variety (In Order of Popularity) Season 1959-60 | | 195 | 7-58 | 195 | 8-59 | 1959-60 | | |
|---|--|--|--|---|--|--|---|--|
| | | Acres Sown | Percentage of Total Area Sown | Acres Sown | Percentage of Total Area Sown | Acres Sown | Percentage of Total Area Sown | |
| Insignia Pinnacle Olympic Sherpa Quadrat Insignia 49 Baldmin Magnet Sabre Beacon Gabo | | 923,903 437,067 11,550 169,021 185,347 40,018 15,843 18,321 11,510 | 49.38 23.36 9.03 9.91 2.14 0.85 0.98 0.62 | 872,373 418,237 132,427 163,889 121,250 51,097 17,601 10,009 9,698 920 18,519 | 47.34 22.70 7.19 8.89 6.58 2.77 0.96 0.54 0.53 0.05 1.01 | 981,765 574,979 316,148 163,818 119,428 64,463 21,613 10,472 8,691 8,452 7,383 | 42.64 24.97 13.73 7.11 5.19 2.80 0.94 0.45 0.38 0.37 0.32 | |
| Varieties | | 31,119 | 1.66 | 26,590 | 1.44 | 25,226 | 1.10 | |
| Total | | 1,870,907 | 100.00 | 1,842,610 | 100.00 | 2,302,438 | 100.00 | |

VICTORIA—PRINCIPAL VARIETIES OF WHEAT SOWN

Rural Industries

Wheat Growing in Conjunction with Livestock Grazed

A table showing the number of holdings in Victoria growing wheat for grain, together with sheep, dairy cattle, and pigs as at 31st March, 1956, appears on page 492.

Oats

The area sown to oats in Victoria is about $1 \cdot 1$ mill. acres, of which about 60 per cent. is harvested for grain, 20 per cent. cut for hay, and 20 per cent. grazed completely. Some of the area harvested for grain is also grazed during the winter. The average annual grain production is about 12 mill. bushels (40 lb. per bushel) and the average hay production 325,000 tons. Average grain yield is 18 bushels per acre and average hay yield is $1\frac{1}{2}$ tons per acre.

About 87 per cent. of the area sown for grain is in the Mallee, Wimmera, and Northern Districts. Oat grain is used on farms for stock feeding and is often held in large quantities for this purpose as an insurance against drought losses. Grain is sold on an open market through merchants or through the voluntary oat pool, and prices fluctuate widely according to seasonal conditions and supplies available. Better quality oats may be bought at a premium for milling purposes.

Oaten hay is grown for farm use in all districts and for sale in areas where chaff mills operate (i.e., near Melbourne and Ballarat). About 40 per cent. of the area sown to hay is in the Mallee, Wimmera, and Northern Districts, and 25 per cent. in the Western District.

Most of the oat area grazed completely is grazed by sheep in the winter, but in dairying districts oats are sometimes sown for autumn and winter grazing to supplement pasture growth. More than 40 per cent. of the completely grazed acreage is in the Mallee District. Most oat crops are grown on stubble land with very little preparation and with a smaller amount of superphosphate (if any), than is used on wheat crops. About 85 per cent. of the area sown to oats is sown to the varieties Algerian, Orient, and Algeribee.

The area harvested (season 1959–60) for hay was 207,351 acres, and for grain 673,002 acres, which produced 320,343 tons of hay, and 12,701,029 bushels of grain respectively. The area of oats sown for grazing purposes, amounted to 198,330 acres. The following table shows the area, yield, and gross value of oats for grain for each of the five seasons 1955–56 to 1959–60:—

| Season | | | Area Production | | Yield per Acre | Gross Value | |
|--|----------|----------|--------------------------|-------------------------------------|---|----------------------------------|--|
| | | | '000 acres | '000 bushels | bushels | £'000 | |
| 1955–56 1956–57 1957–58 1958–59 | | | 871 613 622 971 | 14,858 9,555 9,528 23,339* | $ \begin{array}{r} 17.06 \\ 15.60 \\ 15.31 \\ 24.04 \\ 27 \end{array} $ | 4,671 3,315 5,313 6,820 | |
| 1959–60 | | | 673 | 12,701 | 18·87 | 4,797 | |

VICTORIA—OATS FOR GRAIN

Record production

Barley

Barley is sown on about 300,000 acres in Victoria each year, from which about 6 mill. bushels (50 lb. per bushel) of grain are harvested. The average yield is about twenty bushels per acre. Most of the barley sown is two-row or malting type barley, only a very small acreage being sown to the six-row, feed type.

Barley production is centred in two main districts which have favourable soil and climatic conditions for growing good quality grain suitable for malting. The most important area is the south-western Mallee and the adjoining northern Wimmera, where barley is grown on sandy soils usually in association with wheat. In this district, barley is either sown on wheat stubble land or on ley land cultivated in the autumn just before sowing. The variety Prior is almost exclusively sown, usually with superphosphate. The average district yield is about fifteen bushels per acre.

The other important area is in southern Victoria between Geelong and Bacchus Marsh. In this district, barley is the main crop and is usually sown on fallowed land with superphosphate. The variety Research is grown here, and the average yield is about 30 bushels per acre. This area is close to the main shipping terminals and growers' freight costs are considerably lower than in the northern areas. Barley is grown less intensively in other districts and the quality is rarely up to malting standard.

Barley is marketed through the Australian Barley Board, which provides an orderly marketing system for the barley produced in Victoria and South Australia. The Board classifies growers' grain, on sample, into three grades—malting, milling, and feed—with a price differential between each grade.

Practically all of the malting grade barley is used in Australia, but most of the milling and feed grades are exported to Europe and Japan.

The following table shows the area, yield, and gross value of barley for each of the five seasons 1955-56 to 1959-60:—

| Season | | Area und | ler Crop | Pro | oduce | Ave | Contra | | |
|---------|----|--------------------|------------------|--------------------|------------------|--------------------|------------------|---------|-------|
| | | Malting (2 row) | Other (6 row) | Malting (2 row) | Other (6 row) | Malting (2 row) | Other (6 row) | Total | Value |
| | | '000 acres | '000 acres | '000 bushels | '000 bushels | bushels | bushels | bushels | £'000 |
| 1955-56 | | 291 | 18 | 6,488 | 389 | 22.32 | 21.15 | 22.25 | 3,459 |
| 1956–57 | •• | 325 | 20 | 7,164 | 385 | 22.04 | 18.97 | 21.86 | 3,838 |
| 1957–58 | •• | 334 | 18 | 5,201 | 246 | 15.57 | 13.91 | 15.49 | 3,280 |
| 1958-59 | | 343 | 19 | 8,174 | 407 | 23.80 | 20.97 | 23.65 | 4,165 |
| 1959-60 | | 264 | 14 | 5,318 | 274 | 20.17 | 19.79 | 20.15 | 2,643 |

VICTORIA-BARLEY PRODUCTION

Maize

Maize for grain is cultivated mainly in Gippsland. It is grown in Victoria both for grain and for green fodder. The area, yield, and gross value of maize for each of the five seasons, 1955–56 to 1959–60, are given in the following table :---

| | | | | For | For Grain | | | | |
|--------|------------------|--------|------------|--------|---|---|--|--|--|
| Season | | | | | Area | Produc- tion | Yield per Acre | Gross Value | |
| | | | | acres | acres | bushels | bushels | £ | |
| | | | | 8,665 | 3,535 | 175,813 | 49.73 | 135,002 | |
| | | | | 6,429 | 2,727 | 80,798 | 29.63 | 66,930 | |
| | | | | 8,122 | 4,278 | 241,764 | 56.51 | 158,708 | |
| | | | | 7,619 | 3,881 | 203,366 | 52.40 | 136,876 | |
| | | | | 9,084 | 3,383 | 180,454 | 53.34 | 131,367 | |
| | ··· ··· ·· | Season | Season | Season | Season For Green Fodder acres 8,665 6,429 8,122 7,619 9,084 | Season For Green Fodder Area acres acres 8,665 3,535 6,429 2,727 8,122 4,278 7,619 3,881 9,084 3,383 | Season For Green Fodder For Area Produc- tion 8,665 3,535 175,813 6,429 2,727 80,798 8,122 4,278 241,764 7,619 3,881 203,366 9,084 3,383 180,454 | Season For Green Fodder For Green Area Produc- tion Yield per Acre 8,665 3,535 175,813 49.73 6,429 2,727 80,798 29.63 8,122 4,278 241,764 56.51 7,619 3,881 203,366 52.40 9,084 3,383 180,454 53.34 | |

VICTORIA—MAIZE PRODUCTION

Rye

Cereal rye is a minor crop in Victoria, with about 22,000 acres sown to it annually. This acreage, however, is many times greater than the pre-war area of just over 1,000 acres. The average production is about 150,000 bushels (60 lb. per bushel) per year, and the average yield is about $6\frac{1}{2}$ bushels per acre.

Rye is not a cash crop and it is sown mainly for control of sand drift on sandhills in the Mallee District and, to a much lesser extent, for winter grazing in the colder winter districts. Not all of the area sown is harvested, so that the average yield per acre is probably higher than that recorded. The variety sown is almost exclusively South Australian rye. Superphosphate is used as a fertilizer, with a portion of the Mallee area sown with a mixture of superphosphate and ammonium sulphate.

In recent years, European migrants to Australia have created a small demand for rye for human consumption.

The following table shows the area, yield, and gross value of rye for each of the five seasons 1955–56 to 1959–60:—

| Season | | | Area Production | | Yield per Acre | Gross Value | |
|---------|-----|-----|-----------------|--------|-------------------|----------------|---------|
| | | | | acres | bushels | bushels | £ |
| 1955-56 | | | | 20,043 | 110,451 | 5.51 | 60,748 |
| 1956-57 | | | | 19,419 | 129,729 | 6.68 | 94,054 |
| 1957-58 | • - | | | 17,807 | 84,975 | 4.77 | 72,229 |
| 1958-59 | | | | 27,458 | 226,320 | 8.24 | 114,104 |
| 1959-60 | • • | • • | | 22,344 | 138,438 | 6.20 | 88,831 |

VICTORIA-RYE PRODUCTION

Hay

The pattern of hay production in Victoria has changed considerably in the post-war period. More complete mechanization and the virtual disappearance of the working horse have taken the emphasis from cereal hay. The harvesting of large areas of cereal crops, particularly oats, grown specifically for the production of hay for the maintenance of horse teams, is no longer necessary and there has been a marked decline in the amount of cereal hay produced.

On the other hand, there have been spectacular increases in the production of other forms of fodder. The annual production of meadow hay has increased from about 400,000 tons to over 1 mill. tons during this period. There has also been a substantial increase in the amount of lucerne hay conserved. Silage has become an important supplement to hay for stock feeding, and silage produced mainly from pasture growth has increased from about 25,000 tons annually to over 300,000 tons in the post-war period.

This increase in fodder conservation has resulted in more efficient utilization of the extra herbage grown as the result of pasture improvement in all districts. Record numbers of livestock are now being maintained with greater safety following the conservation of portion of the surplus spring growth for feeding out during periods of seasonal shortage or in drought.

As pastures have been improved and livestock production intensified, the provision of supplementary fodder has become an important factor in the Victorian grazing industry. The conservation of meadow hay fits in well with farm management routine and is a convenient method of ensuring continuity of fodder supplies.

Particulars of areas harvested and production of the several kinds of hay appear in the following table:—

| | | ind | | | Area | Production | Average Yield |
|---------------|---------|-----|----|----|---------|------------|---------------|
| | | | | | acres | tons | tons |
| Wheaten . | | •• | | | 41,708 | 55,956 | 1.34 |
| Oaten . | | •• | | | 207,351 | 320,343 | 1 · 54 |
| Lucerne . | • | | | | 61,443 | 115,831 | 1.89 |
| Barley, Rye, | &c. | •• | •• | | 2,761 | 3,494 | 1.27 |
| Grasses and (| Clovers | •• | •• | | 534,285 | 855,379 | 1 · 60 |
| | Fotal | | | •• | 847,548 | 1,351,003 | 1.59 |

VICTORIA—HAY PRODUCTION, 1959–60

Rural Industries

The following table shows, in respect of each statistical district of the State, the quantity of ensilage made during the 1959–60 season, and the stocks of ensilage and hay held on rural holdings on the 31st March, 1960:—

| | | | (To | ns) | | | |
|------------------|-----|----------|------|----------------|---------------|-------------|--|
| | | District | | Ensilage Made. | Stocks at 31s | March, 1960 | |
| | | | | 1959–60 | Ensilage | Hay | |
| Central | | | | 87,012 | 50,769 | 249,262 | |
| North-Cent | ral | | | 5,804 | 5,171 | 93,019 | |
| Western | •• | | | 19,475 | 28,140 | 360,906 | |
| Wimmera | | | | 1,612 | 7,405 | 148,902 | |
| Mallee | •• | •• | | 1,331 | 7,670 | 55,438 | |
| Northern | | | | 10,588 | 16,517 | 359,635 | |
| North-East | ern | | | 24,931 | 24,548 | 201,571 | |
| Gippsland Tot | | | | 130,813 | 61,364 | 298,124 | |
| | | 1 | | 281,566 | 201,584 | 1,766,857 | |

ENSILAGE MADE AND FARM STOCKS OF ENSILAGE AND HAY

Potatoes

Victoria is the largest producer of potatoes in the Commonwealth, contributing a little more than 40 per cent. of the total annual requirement. The bulk of the Victorian crop is used within the State for human consumption and seed purposes, while each year 40,000 to 50,000 tons are exported to other States to augment local supplies. Potatoes are generally used as a fresh vegetable, but there is increasing interest in processes developed overseas in which cooked potatoes are dried as flakes or granules. These may be stored for some months, and can be prepared for use in a few minutes.

With few exceptions, potatoes are grown in the better soils in higher rainfall areas on and south of the Central Dividing Range, the main districts being Koroit, Beech Forest, Bellarine Peninsula, Ballarat to Trentham, Kinglake, Gembrook, Koo-Wee-Rup swamp and the Gippsland hill country.

Over the past 20 years there has been a very substantial increase in the volume of potato production in Victoria. This is due, not to greater area, but to improvement in the average yield, which has nearly doubled. Higher yielding varieties now being grown, improved cultural methods, availability of virus-free seed through the certification scheme, and wider use of irrigation have contributed to this improvement. Potato growing has become increasingly mechanized and this has precipitated the trend for production of this crop to pass to specialist growers having larger individual areas.

The following table shows the area, yield, and value of potatoes for each of the five seasons 1955-56 to 1959-60:

| | Season | | Area | Production * | Average Yield | Gross Value | |
|---------|--------|--|--------|--------------|---------------|-------------|--|
| | | | acres | tons | tons | £'000 | |
| 1955–56 | | | 37,020 | 163,239 | 4.41 | 12,486 | |
| 1956–57 | | | 39,706 | 227,307 | 5.72 | 5,862 | |
| 1957–58 | | | 49,846 | 251,159 | 5.04 | 3,326 | |
| 1958–59 | | | 46,122 | 259,346 | 5.62 | 5,040 | |
| 1959–60 | 60 | | 48,506 | 242,548 | 5.00 | 5,808 | |

VICTORIA-POTATO PRODUCTION

• Includes amounts held on farms for seed, stock feed, &c., as follows :-21,089 tons in 1955-56; 49,755 tons in 1956-57; 53,842 tons in 1957-58; 42,345 tons in 1958-59; and 31,951 tons in 1959-60.

Onions

The principal onion growing areas are in the Central and Western districts. In the season 1959-60 these areas were responsible for 97 per cent. of the total onion production of the State. The following table shows the area, yield, and gross value for each of the five seasons 1955-56 to 1959-60:—

| | Season | | | Production | Average Yield | Gross Value | |
|------------------|--------|--|-------|------------|---------------|-------------|--|
| | | | acres | tons | tons | £'000 | |
| 195 5–56 | | | 3,337 | 16,955 | 5.08 | 940 | |
| 1956-57 | | | 4,503 | 26,811 | 5.95 | 861 | |
| 1957–58 | •• | | 5,368 | 40,678 | 7.58 | 638 | |
| 1958–59 | •• | | 3,971 | 28,456 | 7.17 | 1,062 | |
| 1959 –6 0 | | | 3,994 | 27,808 | 6.96 | 1,012 | |

VICTORIA—ONION PRODUCTION

514

Linseed

Linseed oil is one of the chief components of paints, varnishes, and linoleum, and has many other industrial uses. The presscake or meal, which remains after the oil has been extracted from the ground and partly cooked seed, is a valuable stock food.

The area sown to linseed in Victoria for the season 1959-60 was 24,850 acres, which produced 295,644 bushels valued at £283,498 (gross). Figures for 1958-59 were 8,817 acres, 11,779 bushels, and gross value £193,863.

Tobacco

Tobacco is grown mainly in the Ovens Valley in the North-East of Victoria.

During the decade ending in 1960, there was a marked expansion of the area planted to tobacco in Victoria and the State now produces one third of the Australian crop. The average yield per acre was substantially higher than that recorded in any previous decennial period; prices were maintained at a satisfactory level and practically all usable leaf was sold, although there was evidence of a weakening demand at the close of the 1960 selling season.

The disease Blue Mould still is the tobacco grower's most important hazard, but its incidence appears to have been limited by greater attention to field hygiene and more efficient management of tobacco seedling nurseries. Both of these factors have contributed to a more stable supply of disease-free seedlings at transplanting time. This is an important pre-requisite for the production of a satisfactory crop.

Adequate funds to support an extension programme and research work are available from a trust fund to which State and Commonwealth Governments, growers, and manufacturers contribute. Problems associated with the industry are being investigated at the Tobacco Research Station, Myrtleford, and in co-operation with private growers in all main tobacco producting districts of the State. Both the Department of Agriculture and the Victorian Tobacco Growers' Association provide an active advisory service to growers by instructors who operate on a farm to farm visiting basis.

The whole of the Victorian tobacco crop, together with that produced adjacent to, but on the New South Wales side of the Murray River, is sold by public auction in Melbourne. The selling season normally extends from early June to the end of September. The following table furnishes details of the area, yield, and gross value in each of the five seasons 1955-56 to 1959-60 :---

| | Season | | Area | Production | Yield per Acre | Gross Value | |
|------------------|--------|--|-------|------------|----------------|----------------|--|
| | | | acres | cwt. (dry) | cwt. (dry) | £'000 | |
| 1955-56 | | | 2,876 | 10,134 | 3 · 52 | 571 | |
| 1956-57 | | | 2,935 | 24,470 | 8.34 | 1,376 | |
| 1957–58 | | | 3,252 | 32,884 | 10.11 | 1,862 | |
| 1958–59 | | | 4,248 | 43,617 | 10.27 | 2,764 | |
| 195 9–6 0 | | | 6,424 | 66,080 | 10.29 | 4,1 4 6 | |

VICTORIA—TOBACCO PRODUCTION

Fruit

Victoria produces one-third of Australia's tree-fruit production, three-quarters of the canned fruit production, and two-thirds of the Commonwealth's dried fruits. Approximately 100,000 acres are devoted to orchards and vineyards.

Fruit producing areas north of the Great Dividing Range have a rainfall which varies from 10 inches per annum in the Mallee to 20 inches per annum in the Goulburn Valley. All the fruit producing areas in this part of the State rely on irrigation. Distribution is mostly by gravity except for small areas of citrus under spray irrigation.

In the south of the State, where apples, pears, plums, cherries, dessert peaches, lemons, and berries are produced, rainfall varies from 20 inches to 40 inches per annum. Many orchards in southern Victoria are irrigated from dams, rivers, or town supplies.

The largest area under a single horticultural crop is the vineyard area at Mildura, Swan Hill, and the War Service Land Settlement area at Robinvale.

Most of the dried fruits production is exported, mainly to the United Kingdom. The pome fruits are next in importance, most of the apples being sold locally or interstate, while most of the pear production is exported to the United Kingdom.

Peaches, pears, and apricots for canning are produced in the Goulburn Valley, where large co-operative canneries are also located.

The total output of 3,878,000 cartons* of canned fruits for the 1960 season comprised apricots, 433,000 cartons; peaches (including 145,000 cartons of mixed fruits), 1,290,000 cartons; and pears, 2,155,000 cartons. In addition to the fruits shown in the following table,

^{*} Basic export carton containing 24 cases of No. 21 can size.

Rural Industries

large quantities of melons, rhubarb, and tomatoes are produced in orchards. The gross value of all fruit grown in the season 1959–60 was $\pm 10,529,869$.

| | Par | ticulars | | | 1955–56 | 1956–57 | 1957–58 | 1958–59 | 1959–60 |
|------------|----------|----------|-----|---------|-----------|-----------|-----------|-----------|-----------|
| Number of | Growers | s | | | 4,891 | 4,936 | 5,044 | 5,065 | 5,076 |
| Area | •• | | | acres | 65,214 | 63,319 | 66,221 | 66,746 | 68,657 |
| Kind of Fr | uit— | | | | | | | | |
| Apples | | | | bushels | 2.648.892 | 2.621.487 | 3,125,088 | 2.969.521 | 3.005.669 |
| Pears | | | | | 2,742,863 | 3,432,090 | 3,730,427 | 3,279,535 | 3,582,549 |
| Quinces | | | | " | 21,048 | 39,073 | 39,941 | 31,431 | 19,595 |
| Apricots | | | | ., | 235,933 | 274,780 | 692,139 | 291,547 | 468,055 |
| Cherries | | | • • | | 76,599 | 86,706 | 74,387 | 97,872 | 101,189 |
| Nectarine | s | | | ,, | 18,340 | 15,289 | 19,875 | 18,770 | 18,896 |
| Peaches | | | | " | 1,162,447 | 878,560 | 1,287,011 | 1,033,712 | 1,210,021 |
| Plums | | | • • | ,, | 148,910 | 104,280 | 157,332 | 139,579 | 156,940 |
| Prunes | | | • • | ,, | 16,894 | 25,574 | 28,878 | 20,540 | 26,594 |
| Lemons | | | | " | 219,348 | 159,153 | 159,085 | 162,616 | 156,217 |
| Oranges | | | | ,, | 770,503 | 711,453 | 796,625 | 830,115 | 1,028,711 |
| Mandarin | s | | | ,, | 17,032 | 14,275 | 15,773 | 24,180 | 20,081 |
| Grapefrui | t | ••• | • • | ,, | 56,421 | 53,917 | 55,900 | 66,894 | 67,214 |
| Figs | | •• | | " | 4,147 | 6,053 | 4,414 | 4,660 | 3,218 |
| Passion-fr | uit | | | " | 6,772 | 5,026 | 5,609 | 4,800 | 2,197 |
| Other Lar | rge Frui | ŧs | •• | " | 7,849 | 8,181 | 12,510 | 12,281 | 11,741 |
| | | | | | | | | | |
| Gooseberr | ries | •• | •• | cwt. | 1,114 | 1,382 | 1,250 | 953 | 1,172 |
| Loganberr | ries | ••• | | " | 2,201 | 1,667 | 2,262 | 2,458 | 2,462 |
| Raspberrie | es | •• | •• | " | 2,148 | 1,733 | 2,150 | 2,486 | 2,862 |
| Strawberr | ies | •• | •• | " | 4,710 | 6,694 | 8,211 | 7,739 | 6,692 |
| Youngber | ries | | •• | " | (a) | 1,342 | 1,823 | 3,383 | 3,833 |
| Almonds | | | | lb. | 87,650 | 85,919 | 121,937 | 92,838 | 115,444 |
| Filberts | ••• | | | ,, | 6,271 | 7,283 | 7,827 | 6,615 | 6,590 |
| Walnuts | •• | •• | •• | 5.0 | 97,708 | 159,743 | 137,544 | 139,660 | 149,136 |

VICTORIA-FRUIT GROWING

(a) Not collected.

The production of the principal kinds of dried tree-fruits for each of the last five seasons is shown in the following table. Particulars in respect of dried vine-fruits appear on pages 519-520.

| | Year | Ended | 30th Ju | ine— | Apricots | Peaches | Pears | Prunes | Other | Total |
|------|------|-------|---------|------|----------|---------|-------|---------|-------|---------|
| 1956 | | | | | 22,682 | 21,228 | 4,015 | 257,341 | 2,022 | 307,288 |
| 1957 | ••• | | | | 12,499 | 272 | 4,481 | 330,762 | 2,945 | 350,959 |
| 1958 | | | | | 24,841 | 2,105 | 744 | 401,108 | 3,686 | 432,484 |
| 1959 | | | | | 72,807 | 5,122 | 6,824 | 355,072 | 1,183 | 441,008 |
| 1960 | | | | | 38,067 | 5,417 | 3,505 | 460,806 | 2,429 | 510,224 |

VICTORIA—DRIED TREE-FRUITS (lb.)

Orchards

The extent of cultivation of each important class of fruit and nuts on holdings of 1 acre and upwards during the seasons 1955-56 and 1958-59 is shown in the following table :—

VICTORIA—FRUIT TREES, PLANTS, ETC. IN ORCHARDS AND GARDENS

| | | | | | Number of Trees, Plants, &c. | | | | | | | | | |
|---------|----------|-----|---------|-----|------------------------------|----------------|-----------|-----------|----------------|-----------|--|--|--|--|
| | Fruit | and | Nuts | 1 | | 1955–56 | | | 1958-59 | | | | | |
| | | | | | Bearing | Not Bearing | Total | Bearing | Not Bearing | Total | | | | |
| Apples | | | • • | • • | 1,529,208 | 420,365 | 1,949,573 | 1,498,638 | 511,163 | 2,009,801 | | | | |
| Pears | | | •• | • • | 1,100,880 | 236,531 | 1,337,411 | 1,124,220 | 376,722 | 1,500,942 | | | | |
| Quince | s | | •• | | 25,655 | 3,709 | 29,364 | 21,402 | 922 | 22,324 | | | | |
| Plums | | | | | 171,634 | 31,463 | 203,097 | 146,136 | 38,127 | 184,263 | | | | |
| Prunes | | | | | 29,046 | 9,302 | 38,348 | 25,332 | 6,385 | 31,717 | | | | |
| Cherrie | s | | | | 121,477 | 56,480 | 177,957 | 117,292 | 48,813 | 166,105 | | | | |
| Peache | s | | | | 835,511 | 189,500 | 1,025,011 | 540,124 | 607,039 | 1,147,163 | | | | |
| Aprico | ts | | | | 376,994 | 73,458 | 450,452 | 312,979 | 89,970 | 402,949 | | | | |
| Nectar | ines | | | | 20,097 | 3,874 | 23,971 | 18,103 | 5,296 | 23,399 | | | | |
| Orange | s | | | | 370,595 | 77,325 | 447,920 | 372,550 | 86,824 | 459,374 | | | | |
| Manda | rins | | | | 6,140 | 5,604 | 11,744 | 9,252 | 9,676 | 18,928 | | | | |
| Grapei | ruit | | | | 22,386 | 2,979 | 25,365 | 22,917 | 1,541 | 24,458 | | | | |
| Lemon | s | | | | 106,644 | 25,608 | 132,252 | 89,869 | 14,704 | 104,573 | | | | |
| Figs | • | | | | 5,506 | 716 | 6,222 | 5,840 | 983 | 6,823 | | | | |
| Raspbe | erries | | | | 209,451 | 46,010 | 255,461 | 247,970 | 60,001 | 307,971 | | | | |
| Logan | berries | | | | 108,403 | 10,675 | 119,078 | 138,129 | 19,001 | 157,130 | | | | |
| Strawb | erries | | | • • | 4,507,904 | 603,608 | 5,111,512 | 6,972,270 | 405,759 | 7,378,029 | | | | |
| Goose | berries | | | • • | 45,302 | 6,646 | 51,948 | 51,762 | 8,480 | 60,242 | | | | |
| Young | berries | | | | • | • | • | 127,304 | 21,600 | 148,904 | | | | |
| Olives | | | •• | | 17,191 | 100,952 | 118,143 | 60,351 | 56,568 | 116,919 | | | | |
| Passion | n-fruit | | | | 22,803 | 6,718 | 29,521 | 15,950 | 8,085 | 24,035 | | | | |
| Almon | ds | | | | 34,781 | 9,211 | 43,992 | 26,496 | 4,576 | 31,072 | | | | |
| Walnu | ts | | | | 7,702 | 2,799 | 10,501 | 6,549 | 2,094 | 8,643 | | | | |
| Filbert | <u>s</u> | | <u></u> | | 3,511 | 1,388 | 4,899 | 3,725 | 458 | 4,183 | | | | |

· Not collected.

The distribution of the fruit industry over the State is set out in the following table, where the number of trees of each kind in each statistical district are given for the season 1958–59 :---

VICTORIA—NUMBER OF FRUIT TREES, PLANTS, ETC., SEASON 1958–59

| | | | | | S | tatistica | l Distric | t | | | |
|---------------|-------|---------|--------------|------------------------|--------------|--------------|-----------|---------------|------------------------|----------------|-----------|
| Partic | ulars | | Cen- tral | North- Cen- tral | West- ern | Wim- mera | Mallee | North- ern | North- East- ern | Gipps- land | Total |
| Growers | | No. | 2,031 | 172 | 125 | 150 | 1,238 | 1,057 | 201 | . 91 | 5,065 |
| Area | •• | acres | 24,116 | 2,483 | 683 | 4,153 | 6,272 | 27,131 | 1,538 | 370 | 66,746 |
| Apples | | trees | 1,445,277 | 185,390 | 57,446 | 18,637 | 12,546 | 187,477 | 73,030 | 29,998 | 2,009,801 |
| Pears | •• | ,, | 277,673 | 60,727 | 1,533 | 9,407 | 3,284 | 1,145,284 | 1,064 | 1,970 | 1,500,942 |
| Peacnes | •• | ,, | 221,768 | 2,382 | 402 | 19,334 | 21,886 | 877,965 | 2,165 | 1,261 | 1,147,163 |
| Apricots | •• | ,, | 73,072 | 760 | 1,354 | 19,967 | 51,286 | 254,741 | 983 | 786 | 402,949 |
| Plums | • • | ,, | 93,477 | 6,203 | 1,184 | 3,649 | 12,346 | 63,024 | 3,456 | 924 | 184,263 |
| Prunes | •• | ,, | 100 507 | 8 | 936 | 11,459 | 7,513 | 11,207 | 51 | 36 | 31,717 |
| Cherries | •• | ,, | 138,786 | 3,581 | 57 | 4,614 | 259 | 10,442 | 7,799 | 567 | 166,105 |
| Quinces | •• | ,, | 11,260 | 639 | 181 | 1,490 | 752 | 7,786 | 140 | 76 | 22,324 |
| Files | •• | ,, | 16,125 | 23 | 85 | 444 | 3,286 | 2,742 | 449 | 245 | 23,399 |
| rigs | •• | ** | 1,539 | 16 | 3/ | 65 | 648 | 3,816 | 631 | 65 | 6,823 |
| Onves | •• | ,, | 294 | ••• | | 95,000 | 19,997 | 1,524 | 92 | 11 | 116,919 |
| Mandarina | • • | ,, | 44.5 | 5 | /3 | 101 | 321,492 | 133,343 | 3,704 | 121 | 459,374 |
| Granofruit | •• | ** | 13 | •• | •• • | | 16,398 | 2,441 | 04 | | 18,928 |
| Lamona | •• | ** | 323 | •••••• | 3 | 22 | 16,961 | 6,974 | 101 | 10 | 24,458 |
| Passion fruit | •• | | 5 220 | 10 | 14 | 250 | 8,790 | 17,959 | 939 | 670 | 104,575 |
| Strambarrian | •• | vines | 7 227 202 | 100 | 111 | 0 | 1,148 | 5,045 | 11,331 | 570 | 7 279,033 |
| Daspharries | •• | buches | 206 201 | 1 020 | | ••• | 25,630 | 21,252 | 3,155 | | 7,378,029 |
| Loganherries | •• | Dusites | 157 127 | 1,020 | | ••• | | /50 | •• | | 157 120 |
| Gooseberries | •• | ,, | 59 421 | 1 507 | | •• | | ••• | ••• | | 137,130 |
| Youngherries | •• | ,, | 148 001 | 1,507 | 4 | ••• | ••• • | •• | ••• | 300 | 148 004 |
| Almonde | •• | trees | 562 | 62 | | 715 | 16 827 | 7 508 | \$ 208 | | 21 072 |
| Walnute | •• | 11005 | 561 | 46 | 21 | 190 | 10,627 | 107 | 5,200 | 565 | 9 643 |
| Filberts | | " | 307 | 40 | 1 | 100 | 400 | 197 | 3 362 | 13 | 4 183 |
| | | ,, | | ••• | 1 | | -799 | 1 | 5,502 | 15 | 4,105 |

Vine Fruits

Most vine fruits grown in Victoria are marketed as dried fruits (currants, sultanas and raisins). Smaller quantities are sold as fresh fruit or are used for wine production. Some 40,000 acres of vines are grown in the irrigated districts of the Murray river at Mildura, Robinvale and Swan Hill. The climate at Mildura and Robinvale provides the high temperatures and clear sunny conditions during the growing season and drying period which are essential for the production of first quality dried fruit. The Swan Hill district with slightly lower temperatures and higher rainfall is less suitable than Robinvale and Mildura.

Dried fruits production in these districts for the season 1959–60 amounted to 38,652 tons of sultanas, 3,331 tons of currants, and 6,113 tons of raisins. After dipping and sun drying by the grower, the dried fruit is processed and packed in packing houses. Approximately 72 per cent. of Victorian produce for the season 1959–60 was exported to the United Kingdom, Canada, and New Zealand.

During recent years the growing of grapes for table use has expanded rapidly and with some growers has become a specialized industry. The main varieties are Waltham Cross, Purple Cornichon, Ohanez, Sultanas, and Muscats. Melbourne and Sydney are the main market outlets, but Indonesia, Colombo, and Singapore may grow in importance as export markets. Grapes for wine production are grown at Rutherglen, Great Western, and Nagambie, mainly without supplementary irrigation. The acreage in these districts is tending to decrease. Increasing quantities of grapes for wine making are now being obtained from the irrigated districts of Mildura and Swan Hill.

A considerable portion of Victorian wine is marketed in Great Britain, New Zealand and Canada.

Particulars of vine production for the five seasons 1955-56 to 1959-60 are given in the following table :----

| | | | Аг | ea | Produce | | | | | |
|-----------------|--|---------------|---------|----------------|--------------------|--------------|--------------|-----------|----------|--|
| | | Number | | | | | Dried Fruits | | | |
| Season | | of Growers | Bearing | Not Bearing | Grapes Gathered | Wine Made | Rai | Raisins | | |
| | | | | - | | | Lexias | Sultanas | Currants | |
| | | | acres | acres | '000 cwt. | '000 gall. | cwt. | cwt. | cwt. | |
| 1955-56 | | 2,474 | 42,295 | 2,522 | 3,087 | 1,312 | 57,933 | 530,414 | 102,992 | |
| 1956–57 | | 2,428 | 41,741 | 3,153 | 4,702 | 2,369 | 81,875 | 919,825 | 79,070 | |
| 1957–58 | | 2,467 | 42,089 | 2,678 | 5,188 | 2,582 | 122,628 | 1,012,220 | 83,063 | |
| 1958 5 9 | | 2,494 | 42,482 | 2,319 | 5,041 | 2,354 | 116,252 | 937,878 | 95,517 | |
| 1959 –60 | | 2,505 | 42,244 | 1,885 | 4,229 | 2,147 | 122,258 | 773,035 | 66,615 | |

VICTORIA-VINE-FRUIT PRODUCTION

Vegetables

The climate of Victoria is such that practically every kind of vegetable can be grown in some part of the State during the favourable season in each area. Consequently, there is a plentiful supply of fresh vegetables on the market for the whole year in normal years.

These vegetables (excluding potatoes and onions) worth about $\pounds 10$ mill. each year to Victoria are harvested from about 35,000 acres.

Most of the vegetables are grown in southern Victoria close to Melbourne. These areas are fairly frost free and also have a well distributed rainfall of from 20 to 35 inches. Soils on which vegetables are grown in southern Victoria vary widely and include sands, sandy loams, clay loams, peat, alluvial peats, and volcanic types. In general, most of these soils require 5 to 12 cwt. of fertilizer per acre for each crop.

The northern portion of the State is warm in summer, but more subject to frost in winter. It contains many areas which are ideal for growing early spring crops and is the home of tomato production, particularly for processing. In this warmer climate, on soils which are mainly reddish sandy loams, vegetables can be planted earlier and mature earlier than in most of the southern districts. Prior to the season 1942–43, statistics dealing with vegetable growing were collected only from those market gardeners who cropped an area of 1 acre or more. Only the surface area employed for vegetable growing was tabulated and, as a consequence, due to double cropping, the actual area utilized was understated. Furthermore, vegetables grown between trees and vines in orchards and vineyards were not recorded.

From the season 1942–43, however, particulars were obtained of all vegetables grown on areas of 1 acre and upwards, including those grown in orchards and vineyards, and allowance was made for double cropping. These changes in practice therefore invalidate any comparison with previous years.

Details of the area, production, and gross value of vegetables are given in the table below for all the more important types, except potatoes and onions which are shown under separate heading on pages 513-514.

VICTORIA—VEGETABLES FOR HUMAN CONSUMPTION, 1959–60

| | Туре | | | Area Sown | Production | Gross Value |
|------------------|--------|----|----|------------|------------|-------------|
| | | | | acres | tons | £'000 |
| Carrots | | | •• | 1,857 | 21,373 | 1,229 |
| Parsnips | | | | 789 | 7,736 | 577 |
| Beetroot | | | | 576 | 5,799 | 309 |
| Tomatoes | | | | 5.216 | 65,457 | 1,877 |
| French Beans | | | | 2,400 | 3,451 | 397 |
| Green Peas-Sold | in Pod | | | 6.891 | 8,095 | 729 |
| Can | ning | | | 3,690 | 3,271 | 128 |
| Cabbages | | | | 1.963 | 22,369 | 472 |
| Cauliflowers | | | | 3,085 | 36,023 | 1.014 |
| Brussels Sprouts | | | | 779 | 2.397 | 293 |
| Lettuce | | | | 2.522 | 8.317 | 1.186 |
| Pumpkins | | •• | •• | 2.017 | 11.254 | 307 |
| Other Vegetables | | | | 3,426 | 14,163 | 824 |
| | Tota | 1 | | 35,211 | 209,705 | 9,342 |

Minor Crops

There are other crops cultivated in Victoria in addition to those enumerated on page 498. The most important of these are nursery products, cut flowers, mustard, sunflowers, agricultural seeds, and hops.

Pastoral and Dairying

Progress of Stock Breeding in Victoria

The first great development in Victoria, or as it was then known, the district of Port Phillip, was the pastoral interest. Millions of acres of lightly timbered land lay at the feet of the newcomers, and the readiest way to wealth was evidently by the division of the land into runs and the depasturing of sheep and cattle. Settlers and stock, at first from Tasmania and eventually from New South Wales, came from the very first year of discovery. According to early statistical records, there were 26,000 sheep, 100 cattle, and 57 horses in the colony on the 25th May, 1836. On the 1st January, 1841, as a result of five years of livestock importation and breeding, there were 782,283 sheep, 50,837 cattle and 2,372 horses. By 1st January, 1851, the livestock population had increased to 6,032,783 sheep, 378,806 cattle, 21,219 horses and 9,260 pigs.

The following table shows the number of livestock in Victoria at decennial intervals since 1861 and for each of the five years 1956 to 1960:

| | | | | | · / | | | |
|--|-------------------|---------------------------------------|---------------------|---|--|--|---|---|
| | | Year | | Horses | Catt | le * | Sheen | Pigs |
| | | | | Foals) | Dairy | Beef | | |
| 1861 1871 1881 1891 1901 1911 1921 | at 1s | t March ,, ,, ,, ,, ,, | | 77 167 276 436 392 472 488 280 | 77 77 1,21 1,71 1,66 1,54 1,54 | 22 21 86 33 02 48 75 | 5,781 10,762 10,360 12,693 10,842 12,883 12,171 16,478 | 61 131 242 282 350 333 175 281 |
| 1931 1941 | " " | ,, ,, | ••• | 380 318 | 1,4. 1,92 | 22 | 20,412 | 398 |
| 1951 1956 1957 1958 1959 1960 | at 31 "" "" | st March "" "" "" | · · · · · · · | 186 119 108 98 91 81 | 1,489 1,663 1,721 1,724 1,653 1,678 | 727 954 1,044 1,026 998 946 | 20,012 23,343 25,831 27,090 26,925 26,597 | 237 227 258 279 253 285 |
| | | | | | | 1 | | |

VICTORIA—LIVESTOCK

* Separate figures for beef and dairy cattle are not available for years prior to 1942-43.

A table showing the sizes of holdings and the numbers of livestock thereon as at March, 1956, appears on page 492.

The following table contains particulars of livestock in each statistical district of the State at 31st March, 1960:—

VICTORIA—DISTRIBUTION OF LIVESTOCK, 1960 ('000)

| | | Statistical District | | | | | | | | | |
|---|-----------------------|----------------------|-----------------------|-------------------|-------------------|-----------------------|------------------------|-----------------------|---------------------------|--|--|
| Particulars | Central | North- Central | West- ern | Wim- mera | Mallee | North- ern | North- East- ern | Gipps- land | Total | | |
| Horses | 24 | 4 | 16 | 5 | 3 | 11 | 8 | 10 | 81 | | |
| Dairy Cattle— Cows in Milk or Dry Springing Heifers Other Heifers for Dairying Calves, under 1 Year— Heifer | 195 13 30 37 | 23 3 5 6 | 252 23 43 50 | 19 2 3 5 | 17 2 3 4 | 192 17 35 51 | 95 15 13 23 | 305 23 44 65 | 1,098 98 176 241 | | |
| Other | 4 7 | 1 1 | 5 10 | 2 2 | 1 1 | 5 7 | 3 | 3 10 | 24 41 | | |
| Total Dairy Cattle | 286 | 39 | 383 | 33 | 28 | 307 | 152 | 450 | 1,678 | | |

| Statistical District | | | | | | | | | | | |
|---|---------------------|----------------|---------------------|---------------------|----------------------|------------------|------------------|---------------------|------------------------|---------------------|-------------------------|
| P | articulars | | Central | North- Central | West- ern | Wim- mera | Mallee | North- ern | North- East- ern | Gipps- land | Total |
| Beef Catt Cows Calves, Bulls, 1 Other | under 1 Year and | Year l over | 74 40 3 31 | 25 17 1 12 | 132 71 6 37 | 9 7 1 3 | 5 4 1 3 | 40 34 2 21 | 87 58 4 38 | 78 53 3 46 | 450 284 21 191 |
| Total Be | ef Cattle | | 148 | 55 | 246 | 20 | 13 | 97 | 187 | 180 | 946 |
| Total All | Cattle | | 434 | . 94 | 629 | 53 | 41 | 404 | 339 | 630 | 2,624 |
| Pigs | | | 55 | 8 | 31 | 9 | 13 | 81 | 33 | 54 | 284 |
| Sheep | | | 2,552 | 2,060 | 8,976 | 3,870 | 1,529 | 4,038 | 1,903 | 1,669 | 26,597 |

VICTORIA—DISTRIBUTION OF LIVESTOCK, 1960—continued ('000)

Dairying Industry

Though faced with the long-term prospect of expanding local markets, both for liquid milk and for dairy products, as the population of this country increases, the Australian dairying industry at present experiences varying fortunes according to the demand in oversea markets and the supply from other countries. In Victoria, however, the demand for good dairying land remains keen.

There is some tendency to sustain competitive land prices by increasing the output of milk or butterfat. Until the middle of the 1930's, 30-cow hand-milked herds were common, and three milkers were usually needed to milk a herd of this size. In the next decade the introduction of milking machines made it possible for two people to milk 30 to 40 cows. In the late 1940's, dairy farmers in large numbers gave up hand-stripping, after machines and one man could then comfortably milk 40 to 45 cows. Doubling up of machine units also made the task easier. In the past three years the introduction of the herringbone-type milking shed has made it possible for one man to milk up to 60 cows and for two men to milk 80 or more.

Pasture improvement has been the basis of the increased carrying capacity of many farms. In some places potash fertilizers and trace elements have played their part; in others the use of more superphosphate and better management and grazing of the pastures have sufficed.

With this increase of production has come a greater need to produce or conserve feed to be used at times when pasture production is slack. This is especially true on farms which supply market milk, as they must fulfil a contract every day of the year. Silage making on dairy farms has increased eightfold in recent years, and is still being taken up by more farmers. More crops are grown to fill the summer and winter feed gaps, and some have resorted to water harvesting and spray irrigation to provide green pasture in summer.

Light tractors with hydraulic three-point linkage have brought with them the tendency to rely on machinery in preference to employing labour.

Advisory services given to dairy farmers by the Department of Agriculture through dairy supervisors, the bi-monthly "Dairyfarming Digest", and other media, have made them more conscious of their need to give thought to every side of farm management. More cows are under test than ever before in Victoria. Many artificial breeding groups have been formed, and a co-operative society formed to conduct the bull centre has been freely supported. There has been increased interest in milking methods, milking machine efficiency, and in the use of new and improved dairy detergents.

Refrigeration of milk on the farm and its collection from bulk vats by road tanker have been proved practicable in some districts, and these practices are now being adopted in other areas.

Local markets are changing. More and more country towns are being provided with supplies of pasteurized bottled milk, and the Milk Board has added the Latrobe Valley and Goulburn Valley to the area under its jurisdiction. In manufacturing, the trend is towards large versatile factories equipped to change from one type of product to another, according to market prospects. There is a growing local market for various types of cheeses hitherto little known in this country, and cheddar cheese is now exported in blocks wrapped in plastic film. These have several advantages over the traditional cylindrical bandaged cheeses.

The industry levy to establish a fund for research and promotion should benefit the dairying industry greatly in the coming years.

Victoria is the principal milk-producing State, and in 1959-60 the Victorian output (603 mill. gall.) represented 43 per cent. of the Australian production.

The following table shows the numbers of cow-keepers and cows, the estimated total production of milk and the gross value of dairy produce for each of the last five years :---

| | At 31 | st March— | Number of Cow-keepers | Number of Dairy Cows* | Estimated Total Production of Milk for All Purposes (Year Ended 30th June) | Gross Value of Dairy Produce† |
|------|-------|-----------|--------------------------|--------------------------|--|-------------------------------------|
| | | | | ····· | '000 gall. | £'000 |
| 1956 | | | 49,693 | 1,172 | 577,475 | 70,094 |
| 1957 | | | 49,153 | 1,220 | 587,199 | 66,330 |
| 1958 | | •• | 48,451 | 1,235 | 565,439 | 65,431 |
| 1959 | | •• | ‡ | 1,204 | 582,948 | 65,264 |
| 1960 | ••• | | 44,124 | 1,098 | 603,127 | 70,471 |
| | | | | | | |

VICTORIA—DAIRYING

Includes cows (in milk and dry) and springing heifers.
 Includes subsidy.
 Not available.

The quantities of butter, cheese, condensed and powdered full-cream milk and casein produced during the last five years were as follows :---

VICTORIA—BUTTER, CHEESE, CONDENSED AND POWDERED MILK, AND CASEIN MADE

| | Year Ended 30th June— | Butter* | Cheese* | Condensed Milk | Powdered Full-Cream Milk | Casein |
|------|--------------------------|-------------|---------|-------------------|--------------------------------|--------|
| 1956 | | 204,632 | 31,383 | 90,766 | 24,859 | 19,128 |
| 1957 | | 200,080 | 46,068 | 100,178 | 24,476 | 16,345 |
| 1958 | | 194,596 | 33,294 | 96,810 | 24,854 | 22,421 |
| 1959 | | 198,652 | 39,140 | 87,288 | 24,585 | 23,528 |
| 1960 | | 201,394 | 43,152 | 99,063 | 23,822 | 20,086 |
| | | | | | | |

('000 lb.)

* Including that made on farms.

The following table shows the number of dairy herds in Victoria, grouped, according to size for each of the four years, 1956 to 1958 and 1960.

Details for 1959 are not available.

| At 31st March- | | Number of Herds- | | | | | | | | | | | |
|----------------|--|------------------|------------------|------------------|------------------|------------------|------------------|----------------------|--------|--|--|--|--|
| | | 5 to 9 Cows | 10 to 14 Cows | 15 to 19 Cows | 20 to 29 Cows | 30 to 49 Cows | 50 to 99 Cows | 100 Cows and over | Total | | | | |
| 1956 | | 6,077 | 2,817 | 1,928 | 3,466 | 6,892 | 7,528 | 1,213 | 29,921 | | | | |
| 1957 | | 6,183 | 2,916 | 1,953 | 3,448 | 6,893 | 8,042 | 1,310 | 30,745 | | | | |
| 1958 | | 5,889 | 2,801 | 1,860 | 3,215 | 6,402 | 8,406 | 1,464 | 30,037 | | | | |
| 1960 | | 4,304 | 2,262 | 1,682 | 2,971 | 6,155 | 8,488 | 1,397 | 27,259 | | | | |

VICTORIA—DAIRY HERDS, CONTAINING FIVE COWS OR MORE, GROUPED ACCORDING TO SIZE

The numbers of farmers with less than five cows were:—19,772 in 1956, 18,408 in 1957, 18,414 in 1958, and 16,865 in 1960. These numbers were excluded from the above table as the groups were considered too small to be classed as dairy herds.

Eradication of Tuberculosis

Tuberculosis has been present in dairy cattle in Victoria since the dairy industry was first established. As long ago as 1884, it was recognized that the disease was a serious cause of loss to the cattle industry as well as being a likely source of spread of infection to the human population of the State.

Under the Milk and Dairy Supervision Act which was introduced in 1905, inspectors were empowered to take action where cattle were found suffering from this disease, and in 1924 a Compensation Fund was established through which owners of cattle which had been destroyed because of tuberculosis could be compensated for their loss. Regular inspection of herds and slaughter of cattle infected by tuberculosis, combined with tuberculin testing of herds, was carried out by the veterinary staff of the Department and considerably reduced the incidence of this disease in Victorian dairy herds.

Following the lead of progressive dairying countries such as Denmark and the United States of America, action was taken in 1937 to step up the amount of tuberculin testing being carried out in Victoria and all cattle supplying milk to the Metropolitan Area of Melbourne were thus tested. This did not of itself lead to the eradication of tuberculosis from any particular area, but it reduced considerably the number of infected herds in the State.

Meanwhile, in the United Kingdom, a tuberculosis eradication programme on an area basis had been developed and great progress was being made. In 1958, an area eradication plan based on that of the United Kingdom was put into effect in this State. Under this plan, all the dairy cattle in two proclaimed areas in Victoria will be subjected to tuberculin tests over a period of six years. At the end of that time it is expected that the disease will have been eradicated from the cattle in those areas and it will then be possible to proceed with testing in adjoining areas.

The actual testing is being carried out by veterinary practitioners resident in the areas and the cost of this testing is being borne by the Government. Before testing commenced in these areas, it was estimated that 1 per cent. of the cattle would give a positive reaction. To the end of April, 1961, 16,512 herds with 326,829 cattle have been tested with a reactor rate of 0.5 per cent., which is a little below the estimated As well as paying the cost of testing, the Government makes figure. a contribution of 40 per cent. of the compensation payable to the owners of cattle which are slaughtered because of tuberculosis. At the present time the annual cost to the State of the testing actually carried out is £25,000 and the contribution to the Compensation Fund for all cases of tuberculosis of cattle is $\pounds 28,018$.

Pig Industry

Between 20,000 and 25,000 tons of pig carcasses are produced in Victoria in a year. Most of them are consumed here. Only a few are exported to other countries. About half the pig meat is used as fresh pork or for sausages and other meat products. The other half is made into bacon and ham, some of which is canned. Victoria is a net importer of pig meat.

Farmers sell pigs to meat works either directly or through public auction sales. There are adequate facilities for selling pigs in most districts. Pigs are sold for meat as porkers about 4 to 5 months old and yielding dressed carcasses of 60 lb. to 100 lb.; as baconers, 5 to 7 months old and with dressed carcasses of 120 lb. to 160 lb., or as backfatters yielding carcasses of 200 lb. to 500 lb. after having been discarded from the breeding herd. Rural Industries

Most of the pigs in Victoria are in small herds on dairy farms and mixed farms. The sizes of the herds are related to the quantities of separated milk and other food by-products of the farms. A food supply which is adequate in quality, quantity and cost is the basis of economic pig production. There are few specialized pig farms in Victoria. Their main food supplies are buttermilk and whey from dairy produce factories, and food refuse from eating places and food factories.

Pig prices vary and farmers have practically no control over them. Prices are usually higher in spring when there are fewer pigs in the market, than in autumn when there are more pigs. Seasonal fluctuation in the quantities of milk available for pig feeding is the usual cause of fluctuating supplies of pigs to markets.

Another cause of fluctuation in production and prices of pigs, not so regular but sometimes big enough to cancel the seasonal one, is due to big increases or decreases in pig breeding. As three-quarters of the pig breeders in Victoria have an average of less than three breeding sows each, an addition of one more sow when prices are favourable results in a substantial overall increase.

The number of pigs in Victoria at 31st March, 1960, was 284,505. About 78 per cent. of these are held in the Central, Western, Northern, and Gippsland districts which are so largely devoted to dairying. The following table shows classifications (in statistical districts) of pigs, together with the numbers of pig-keepers :---

| Statistical District | | | Boars | Breeding Sows | All Other | Total Pigs | Pig Owners |
|----------------------|-------|-----|-------|------------------|-----------|------------|------------|
| Central | | •• | 1,009 | 7,965 | 46,159 | 55,133 | 1,435 |
| North-Cent | ral | ••• | 276 | 1,525 | 6,285 | 8,086 | 472 |
| Western | | | 805 | 4,967 | 24,721 | 30,493 | 1,398 |
| Wimmera | •• | •• | 317 | 1,715 | 7,418 | 9,450 | 885 |
| Mallee | | ••• | 385 | 2,198 | 10,840 | 13,423 | 865 |
| Northern | | | 1,935 | 13,297 | 65,881 | 81,113 | 2,243 |
| North-Easte | rn | | 949 | 5,507 | 26,326 | 32,782 | 1,258 |
| Gippsland | | •• | 1,441 | 8,942 | 43,642 | 54,025 | 1,918 |
| | Total | | 7,117 | 46,116 | 231,272 | 284,505 | 10,474* |

VICTORIA—PIGS AND PIG-KEEPERS, 31st MARCH, 1960

* Of this number 2,614 had herds of under 5 pigs, 1,514 herds of 5 and under 10, 1,991 herds of 10 and under 20, and 4,355 herds of 20 pigs and over.

The following table shows the number of dairy herds (in size groups) separated into those where pigs are held, and those where no pigs are held. The sizes of pig herds are also shown.

| | | | | Size of | | with | with | with | | | | |
|----------------------------|----|-------|-------|---------|-------|-------|-------|-------|--------------------|------------------|---------------------|-----------------------|
| Cattle Herd (Numbers) 1 | | 1-4 | 5-9 | 1014 | 15-19 | 20–29 | 30-49 | 50-99 | 100 and over | Holdings Pigs | Holdings No Pigs | Holdings Dairy Cat |
| 1-4 | | 529 | 76 | 54 | 34 | 26 | 40 | 30 | 26 | 815 | 14,111 | 14,926 |
| 5–9 | | 573 | 100 | 77 | 23 | 43 | 27 | 20 | 18 | 881 | 6,576 | 7,457 |
| 10–14 | | 349 | 112 | 49 | 27 | 40 | 20 | 9 | 13 | 619 | 2,934 | 3,553 |
| 15-19 | | 222 | 86 | 58 | 15 | 30 | 17 | 11 | 2 | 441 | 1,735 | 2,176 |
| 2029 | | 363 | 198 | 110 | 62 | 57 | 29 | 16 | 7 | 842 | 2,523 | 3,365 |
| 30-49 | | 473 | 416 | 314 | 196 | 232 | 109 | 39 | 3 | 1,782 | 3,792 | 5,574 |
| 50–99 | | 357 | 529 | 580 | 430 | 723 | 617 | 208 | 36 | 3,480 | 6,541 | 10,021 |
| 100 and ove | r | 53 | 85 | 110 | 108 | 225 | 367 | 249 | 58 | 1,255 | 2,176 | 3,431 |
| Total | •• | 2,919 | 1,602 | 1,352 | 895 | 1,376 | 1,226 | 582 | 163 | 10,115 | 40,388 | 50,503 |

VICTORIA—PIG-KEEPING IN CONJUNCTION WITH DAIRYING : NUMBER OF HOLDINGS AT MARCH, 1956

Sheep Industry

The world renowned Merino is the most common sheep breed in Victoria. In 1959, the sheep population of this State comprised Merinos 42.4 per cent., Corriedales 13.5 per cent., Polwarths 4.4 per cent., Comebacks 12.7 per cent., Crossbreds 22.2 per cent., and British breeds 4.8 per cent., consisting mainly of Border Leicesters, Dorset Horns, Romneys, and Southdowns.

The Merino is the main wool producing breed and it also plays an important role in the breeding of Comeback and Crossbred sheep. These are produced mainly by crossing the Merinos with Corriedales, Polwarths, and Border Leicesters.

The pure British breeds are mostly run in small stud flocks which produce rams for cross breeding in fat lamb production.

The two main sheep enterprises are wool production and fat lamb production.

Wool is produced mainly in the Western and Southern Wimmera districts where both rainfall and topography are ideal for the development of improved pastures. The majority of these flocks breed their own replacements and consist of about one-third breeding ewes and two-thirds wethers which are the best wool producing sheep.

Nearly half of Victoria's total wool production comes from these two areas and the wools are much sought after by oversea buyers because of their high yield, good colour, soft handling, and freedom from dust and seed.

On the other hand, most of the fat lambs are produced in the Wimmera, Mallee, and Northern districts where fat lamb production has become complementary to cereal production. These lambs are produced mainly from strong crossbred ewes which graze on clover and medic pastures—an important part of the clover ley system of crop rotation. The lambs are usually dropped in the autumn and fattened on the late winter and early spring crop feed. The majority are cashed from August to November. Wool from these areas is poor in quality and contains more seed and vegetable fault than that produced in the higher rainfall districts.

Fat lamb production is also carried on in the South Western, Central and Gippsland districts, where rainfall and country favour the development of highly improved pastures which carry well into the summer.

These lambs are usually dropped later than in the cereal growing districts and after fattening on spring and summer pastures the majority are cashed in local markets from November to April.

The wools produced in these areas are mainly fine and strong crossbred types, which have good style and no dust or vegetable fault.

A description of the types and qualities of wool in the wool growing districts of the State appears on pages 534 to 536.

The numbers of sheep in Victoria in various years since 1861 are shown in table on page 522. The distribution of all live stock is shown in table on pages 522-523.

Factors such as seasonal conditions, prices of wool, mutton, and lamb and, to a less degree, wheat, affect the number of sheep in the State in any given year. In an adverse season flocks may be reduced by mortality due to lack of fodder or water, by the increase in the slaughtering of fat stock or by the decrease in lambing. Decreased imports from other States are another factor. In addition to the seasonal movements of sheep from New South Wales and South Australia for agistment, there is a regular importation of sheep from those States for slaughtering purposes.

Lambing

Climatic conditions also play a large part in determining the proportion of lambs dropped to ewes mated, and thus the natural increase from season to season may vary considerably. The following table shows the numbers of ewes mated or intended to be mated and lambs dropped, in each of the five seasons 1956 to 1960:—

| Season | | | | Ewes Inten de d for Mating | Ewes Actually Mated | Lambs Marked | Proportion of Lambs Marked to Ewes Mated* |
|--------|----|----|----|---|---------------------------|-----------------|---|
| 1956 | | | | '000 9 984 | '000' | '000 8 670 | % 87 |
| 1957 | | | | 11,204 | ÷ | 9,496 | 85 |
| 1958 | •• | •• | | 10,794 | 10,173 | 8,455 | 83 |
| 1959 | •• | •• | | 11,403 | 11,232 | 9,357 | 83 |
| 1960 | •• | •• | •• | 10,837 | ‡ | ‡ | ‡ |

VICTORIA-LAMBING

• Prior to 1958 this proportion was based on farmers' intentions at the beginning of the season.

† Not available.‡ Not yet available.

Sheep and Lambs in Statistical Districts

The following tables set out the numbers of rams, ewes, wethers and lambs depastured in each Statistical District of the State at 31st March, 1960, and the numbers of ewes mated classified according to whether the progeny is intended for wool or for fat lamb production :—

VICTORIA—RAMS, EWES, ETC., IN EACH STATISTICAL DISTRICT AT 31st MARCH, 1960

('000)

| D | Statistical District | | | | | | | | | |
|--|----------------------------------|-------------------------------|---------------------------------------|------------------------------------|-------------------------------|---------------------------------|-------------------------------|-------------------------------|--|--|
| Particulars | Central | North- Central | Western | Wim- mera | Mallee | North- ern | North- Eastern | Gipps- land | Total | |
| Rams Breeding Ewes* Other Ewes Wethers Lambs | 30 1,089 122 814 497 | 21 820 71 771 377 | 102 3,588 543 2,780 1,963 | 41 1,543 203 1,249 834 | 22 897 19 211 380 | 57 2,275 85 714 907 | 24 963 58 506 352 | 17 719 72 498 363 | 314 11,894 1,173 7,543 5,673 | |
| Total Sheep and Lambs | 2,552 | 2,060 | 8,976 | 3,870 | 1,529 | 4,038 | 1,903 | 1,669 | 26,597 | |

* Includes breeding ewes not mated (1,056,798 at 31st March, 1960).

VICTORIA—LAMBING, 1959 SEASON

| D | Statistical District | | | | | | | | | |
|--|----------------------|-------------------|----------------------|----------------------|------------------|----------------------|-------------------|------------------|-----------------------|--|
| Particulars | Central | North- Central | Western | Wim- mera | Mallee | North- ern | North- Eastern | Gipps- land | Total | |
| Ewes Mated '000 Lambs Marked '000 Percentage | 1,021 899 88 | 785 651 83 | 3,150 2,563 81 | 1,491 1,199 80 | 956 758 79 | 2,263 1,957 86 | 934 781 84 | 632 549 87 | 11,232 9,357 83 | |

VICTORIA—LAMBING FORECAST, 1960 SEASON (As Advised by Farmers at 31st March, 1960) ('000)

Ewes Mated or Intended to be Mated (For Lambing during 1960 Season) Breed of Rams Used Statistical District Total North-Central Wim-North-North-Gipps-land Central Mailee Western mera Eastern Merino Corriedale 291 187 3,431 144 247 1.445 806 136 175 ог Polwarth 198 111 903 173 88 222 121 79 1,895 • • Shortwool Breeds 557 288 453 194 343 1,122 429 296 3,682 Longwool Breeds 102 104 336 303 546 169 109 1,829 160 750 3,137 870 2,181 10,837 1,001 1,333 906 659 Total . .

Breeds of Sheep

The method of collecting particulars of breeds was changed considerably in 1950 and, apart from Merinos, all comparison with breeds of previous years is nullified. Merino Comebacks were previously collected as a whole, irrespective of whether they were fine or coarse. The 1950 collection made provision for segregating those "finer than half-bred", while those not up to that standard were included with other crossbreds.

Similarly, it cannot be determined if any increase in the numbers of other Pure Breeds (British and Australasian) has occurred as another very important change in method was the substitution of the category "Other Recognized Breeds" in place of the former category "Other Pure Breeds". Other Pure Breeds in 1947 numbered 1,407,349, whereas in 1953 Other Recognized Breeds numbered 5,220,326. Crossbreds, which numbered 6,923,603 in 1947, dropped to 5,625,483 in 1953 notwithstanding the inclusion of half-bred and coarser Merino Comebacks.

Australasian breeds are the Polwarth and the Corriedale. The Polwarth is a Merino-Lincoln cross (approximately three-quarters Merino and one-quarter Lincoln). It was evolved to meet the conditions of light wool-growing localities found to be too wet and cold for the pure Merino. The Corriedale was evolved by heavily culling the progeny of Lincoln rams and Merino ewes and by judicious mating over several years. The Corriedale is a dual purpose sheep, being favoured by many breeders both for lamb raising and for wool production.

The following table shows the breeds of sheep and rams in Victoria (by statistical districts) at the 31st March, 1959 and 1960 respectively :---

| Statistical Distric | :t | Merino | Other Recognized Breeds | Merino Comeback (Finer than Half-bred) | Crossbred (Including Half-bred and Coarser Comebacks) | Total |
|---------------------|------------|--------|-------------------------------|---|---|--------|
| Central | | 527 | 787 | 306 | 877 | 2,497 |
| North-Central | | 920 | 390 | 258 | 436 | 2,004 |
| Western | | 4,130 | 2,747 | 1.158 | 813 | 8,848 |
| Wimmera | | 3,052 | 505 | 211 | 416 | 4,184 |
| Mallee | | 636 | 238 | 293 | 536 | 1,703 |
| Northern | | 1,124 | 792 | 575 | 1,678 | 4,169 |
| North-Eastern | | 524 | 392 | 311 | 698 | 1,925 |
| Gippsland | ••• | 496 | 268 | 311 | 520 | 1,595 |
| Total | <u>.</u> . | 11,409 | 6,119 | 3,423 | 5,974 | 26,925 |

VICTORIA—BREEDS OF SHEEP, 31st MARCH, 1959 ('000)

VICTORIA-BREEDS OF RAMS, 31st MARCH, 1960

| Statistical | District | Merino | Corrie- dale | PoI- warth | Border Leicester | Dorset Horn | South- down | Other | Total |
|--|--|--|---|---|---|---|---|---|---|
| Central North-Central Western Wimmera Mallee Northern North-Eastern Gippsland | ··· ·· ·· ·· ·· ·· ·· ·· ·· ·· ·· | 4,419 7,366 51,304 25,476 3,984 8,827 4,528 4,436 | 4,045 2,738 18,214 5,009 2,188 5,427 2,357 1,550 | 1,938 383 10,243 393 129 677 850 327 | 1,523 1,871 1,522 3,217 6,962 12,702 3,580 1,005 | 9,363 4,348 7,301 5,044 7,112 21,787 6,814 4,140 | 4,273 2,205 3,368 266 94 4,371 2,306 2,238 | 4,382 2,147 10,345 1,977 845 3,469 3,804 3,096 | 29,943 21.058 102,297 41,382 21,314 57,260 24,239 16,792 |
| T | otal | 110,340 | 41,528 | 14,940 | 32,382 | 65,909 | 19,121 | 30,065 | 314,285 |

C.2323/61.-18

Production of Wool

Statistics of wool production are obtained direct from the growers, from fellmongeries and, for wool exported on skins, from the Department of Customs and Excise.

| Statistical District | Sho | orn | Wool (Including | Clipped Crutchings) | Average | |
|---|--|--|--|--|--|--|
| Statistical District | Sheep | Lambs | Sheep's | Sheep's Lamb's | | Per Lamb |
| | '00 | 00 | ·000 | lb. | 11 |) . |
| Central North-Central Western Wimmera Mallee Northern Gippsland | 2,193 1,996 8,712 3,961 1,372 3,863 1,861 1,435 | 634 476 2,159 1,005 458 1,169 449 473 | 21,873 20,244 86,083 42,286 14,596 39,053 17,941 13,265 | 1,797 1,248 5,660 2,811 1,289 3,373 1,168 1,275 | 9.97 10.14 9.88 10.68 10.63 10.11 9.64 9.25 | 2.84 2.62 2.62 2.80 2.81 2.89 2.60 2.69 |
| Total | 25,393 | 6,823 | 255,341 | 18,621 | 10.06 | 2.73 |

VICTORIA-SHEEP AND LAMBS SHORN, SEASON 1959-60

VICTORIA-SHEEP SHORN AND WOOL CLIPPED

| Season | | Sh | orn | Wool ((Including | Clipped Crutchings) | Average | |
|---|--------------|--|---|---|--|---|--|
| | | Sheep | Lambs | Sheep's | Lamb's | Per Sheep | Per Lamb |
| | | '00 | 00 | ·000 | lb. | 11 |) . |
| 1955–56 1956–57 1957–58 1958–59 1959–60 | | 21,498 22,674 24,832 25,553 25,393 | 5,329 6,556 7,182 5,821 6,823 | 223,736 249,945 240,510 241,872 255,341 | 14,811 20,421 19,487 15,703 18,621 | 10 · 41 11 · 02 9 · 69 9 · 47 10 · 06 | 2 · 78 3 · 12 2 · 71 2 · 70 2 · 73 |

VICTORIA-WOOL PRODUCTION AND VALUE

| Seasor | 1 | Clip | Stripped from and Exported on Skins, &c. (Greasy) | Total Quantity (Greasy) | Gross Value | Average Price Per lb. |
|---|----------|---|---|---|--|---|
| | | | '000 lb. | | £'000 | d. |
| 1955–56 1956–57 1957–58 1958–59 1959–60 | | 238,547 270,366 259,997 257,575 273,961 | 34,810 29,206 36,493 41,269 49,265 | 273,357 299,572 296,490 298,844 323,226 | 69,020 97,659 76,255 59,471 75,814 | 60.60 78.24 61.73 47.76 56.29 |

532

Wool Marketing System

Samples of Australian wool, taken to England by McArthur and by Marsden early in the nineteenth century, aroused considerable interest and in 1808 the first commercial consignment of one bale was sold in London. The years following saw regular sales there, the wool being consigned by the grower himself or by speculative or general merchants. However, the round journey of the wool out and the cash home resulted in a long period of uncertainty.

The present system of wool marketing has been built up over more than a century by the efforts of many able and energetic leaders, notably Thomas Sutcliffe Mort who prompted the first Australian auctions held at Sydney in 1843, and Richard Goldsbrough who started the sale of Victorian wool and produce in Melbourne in 1848. Geelong, the third Australian centre, was established in 1857.

On these foundations has been built a marketing system probably unique in world commerce, where a product is sold, in the presence of its grower, to the highest bidder amongst manufacturers and their agents from all over the world. Practically the whole of the Australian clip is sold under this system of local realization, which requires the provision of facilities for receiving, storing and showing the wool, and a closely integrated programme of orderly offering. Each year estimates are made of the quantity of wool available for auction, and the Australian total is divided between Northern, Southern, and Western centres, which each have their resident buyers.

The Commonwealth annual production of almost 5 mill. bales is marketed under the auction system. It is disposed of in the various selling centres of all State capitals and a number of provincial cities. The sales programme in all centres is arranged by the National Council of Wool Selling Brokers of Australia, after consultation with buyers. Later, State allocation committees attend to details such as individual sale dates and the quantities to be offered in each centre at the various sales.

Victorian buyers cover, as well as Melbourne, Geelong, and Ballarat, auctions at Albury, Adelaide, Hobart, and Launceston, and allowing for this, a sales programme for the complete season is prepared. This recognizes the buyer's problems of transport and accommodation and ensures that supplies are evenly spread, not only in quantity, but in type and quality, so that there is a representative selection to meet the varied demand. Thus, by controlling the amount of wool offered, an orderly marketing system is maintained.

Auction System

Under the auction system wools are displayed on the show floors of woolbrokers' stores, equipped with sawtooth roofs, giving clear, even lighting. This presentation of the wool under conditions which promote the interest of the grower, and at the same time retain the confidence of the buyer is the responsibility of the selling broker, and involves strict and thorough attention to detail. On arrival at the store, each bale is weighed by a sworn weigher, and the weight, brand, and description is marked on the head. The wool is stacked to await its turn of offering, which occurs in rotation according to date of arrival. When the wool is due for sale, a representative portion is taken to the show floor, and there the brokers' wool experts inspect it and arrange it into lots. It is also inspected and valued by buyers, who represent oversea and local wool users. Should any lot need additional attention, it is sent to the required department for treatment. The operation of reclassing, by which skilled classers grade a grower's consignment according to quality, length, colour, &c., and the bulk classing department, where large lots are made from various owners' wools, are important services which the broker provides.

The whole of the offering in each catalogue is valued by the brokers' experts, who keep in the closest touch with the market and its movements. When the auction begins, the auctioneer is accompanied by the wool expert who is able to protect the growers' interests. In this way, the grower exercises control up to the last moment, and may withdraw any lot if the bids do not conform to his ideas of value.

The Wool Exchanges are the hub on which the big business of wool revolves. Bidding is vocal, buyers advancing their prices by $\frac{1}{2}d$., $\frac{1}{2}d$., or even more until limits are reached and the lot falls to the bid of the last caller. The sale is conducted with great rapidity, and in approximately two hours 850 lots will possibly have been sold, as on a normal market it takes on an average only eight seconds to dispose of an individual lot or line of wool. Although about 5 mill. bales are disposed of in the various centres of the Commonwealth during the course of a season, with proceeds representing millions of pounds, disputes are few. This is a remarkable and gratifying feature of the auctions, which it will be seen are based on the confidence, goodwill, and mutual trust of all parties.

At the fall of the auctioneer's hammer, the ownership of the lot passes from the woolgrower to the woolbuyer, but the woolbroker still performs some service by storing it in his warehouse until it is required by the buyer. If the wool is to go overseas it is dumped, or compressed tightly and held by metal bands. The broker then has it delivered to the ship, or the local mill, and at that point marketing ends, and wool enters the process of manufacture.

Wool-growing Districts

In the following sections, the main wool-growing districts of the State are described with their main characteristics :---

Mallee

The country, being dry, is generally extremely dusty and this is reflected in the wools. Many types are grown. The wools, however, are usually in dry order, of serviceable staple and often yield better than appearance indicates. More often than not, the wools carry a considerable percentage of dust, particularly on the backs, while at times some trefoil burr is also noticeable. The small mixed consignments from these areas lend themselves particularly to the bulk classing system. Wools from the western side extending through Murrayville to the South Australian Mallee show less dust and are normally deeper grown than those east and north, but as a rule are better nourished. Mallees are usually of good average and average standard, and are early offering consignments.

Goulburn Valley

Comebacks, fine to medium Crossbreds, principally of good and good average style, are produced in these divisions. The products carry a certain amount of extraneous matter in the shape of dust and trefoil burr, especially from the irrigation areas. On the rich river flats, fat-lamb raising is carried out extensively, and there is a multiplicity of types of wool (both sheep's and lamb's) seen from these areas on the Melbourne show floors throughout the course of a season. Early and mid season are the offering periods.

Wimmera

Wimmera pastures are extensive in nature, resulting in diversified types of wool, varying from good average style Merinos and Crossbreds (disclosing dust and burr) grown on the northern side to distinctly better class wools from the central and western divisions, which enter the good-to-super and occasionally the super range. Central Wimmera wools are lighter in dust and vegetable fault than those in the north, and are usually of serviceable staple, style, and bulk. The best wools, however, are drawn from the areas adjoining the Western District, to which in many respects they are allied so far as quality, cleanliness, and freedom from fault are concerned, although lacking perhaps quite their bloom and brilliance. Northern Wimmera wools are early offering, others mid and late season.

Western District

Some of the most attractive Merino, Comeback, and Crossbred wools in the world are produced from these renowned areas and, whether the flocks are large or small, comparatively high figures are obtained at auction for the product. A percentage is of super to extra-super standard, denoting breeding and perfect conditions, both in climate and pasture, for wool production. Associated with these wools is that particularly excellent bloom, rarely obtainable elsewhere. For style, depth of staple, high clean scoured yield and their practically free nature, these wools are supreme and bear a high reputation the world over. Other productions are of good to super and good standard. Offering periods are mid and late season.

North-Central Victoria

This embraces areas both north and south of the Dividing Range. In the southern section, the climate is rather cold and wet, and is, generally speaking, more suitable to Comebacks and Crossbreds, but it has been proved that both fine and medium wool Merino types can also be produced with success. The wools are attractive, free, and of super and good-to-super types, but generally are not so light in condition or as stylish as those produced in the Western District. Amongst the smaller growers in the colder areas, the Polwarth, with its deeper staple, is in demand, while the Corriedale is also favoured. Those from the northern section show light dust and fault. They are mid and late season offering.

North-East Victoria

These wool clips usually come to market in attractive order, the many Comebacks and Crossbreds produced—especially those on the tablelands and hill country to the east of the Hume Highway—being outstanding for their light condition and clean order. The wools are white, free, and mainly of good and good to super standard. They do not handle quite as well as Western District wools, but are of good staple and bulk and often hold advantages in yield owing to their water-washed condition. In certain seasons there could be some weather discolouration. They are mid season offering wools.

Gippsland

Merinos, Comebacks, and fine Crossbreds of good and good-to-super style are produced from Gippsland, the larger percentage being the two last-named. The greatest number of the sheep population is maintained in the area from Traralgon to Bairnsdale, extending to the Lake Country and Omeo Plateau. These wools are not so compact in arrangement as those from the west of the State, but are lofty and full handling. The great majority are free in nature with reasonably good bloom and sometimes distinguished by a slightly bluish tinge. Light trefoil, however, is apparent in the wools from the Tambo Valley area. Gippsland consignments are mid and late season offering.

Central Victoria

This division includes a rather comprehensive range of country, embracing a portion of Gippsland and the Mornington Peninsula on the east, to Geelong, Bacchus Marsh, Werribee, &c., on the west, and areas in and around Romsey to the north. Although some nice Merino clips come forward from Bacchus Marsh, supplies from the other districts consist mainly of Comebacks and Crossbreds of varying type. The majority, however, are in more or less free order, covering good average, good, and good-to-super types. They are mainly mid season offering.

Wool Prices

The following information about the average prices of wool per lb. which have prevailed during the last three seasons has been obtained from Victorian wool brokers. These prices are for wool auctioned in Victoria. Wool from the Riverina and the south-east of South Australia is included in Victorian sales.

| | | | Price Range per lb. in- | | | | |
|----------------------|--------|-----|-------------------------|------------|------------|--|--|
| Class of Wo | ool | | 1957–58 | 1958–59 | 1959–60 | | |
| GREASY ME | RINO | | <i>d</i> . | <i>d</i> . | <i>d</i> . | | |
| Extra Super (Western | Distri | ct) | 100-160 | 90-125 | 100-330 | | |
| Super | | | 80-145 | 65-115 | 80-180 | | |
| Good | | | 70-105 | 55-80 | 70–150 | | |
| Average | | | 55- 85 | 45-65 | 50-70 | | |
| Wasty and Inferior | • • | | 35- 75 | 25-60 | 35- 60 | | |
| Extra Super Lambs | | | 95-250 | 75–195 | 140-240 | | |
| Super Lambs | | | 60-140 | 45-110 | 110-190 | | |
| Good Lambs | | | 40-100 | 30-90 | 50-125 | | |
| Average Lambs | | | 30- 65 | 25- 50 | 40-90 | | |
| Inferior Lambs | | | 25- 45 | 20-35 | 30-45 | | |

VICTORIA—PRICES OF WOOL

| | 1 | | |
|--|--|--|--|
| | Pr | rice Range per lb. i | n— |
| Class of Wool | 1957~58 | 1958–59 | 1959-60 |
| GREASY CROSSBRED | d. | d. | d. |
| Extra Super Comebacks Super Comebacks Fine Crossbred Medium Crossbred Coarse Crossbred and Lincoln Super Fine Crossbred Lambs Good Crossbred Lambs Coarse and Lincoln Lambs | 85–100 75– 90 45– 85 35– 70 30– 65 50– 85 40– 65 35– 65 | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | 80-110 75- 85 50- 80 45- 75 35- 60 70-120 50- 85 35- 60 |
| Record Prices for the Season | | | |
| Greasy Merino Fleece ,, Comeback Fleece ,, Merino Lambs ,, Comeback Lambs | 195 113 3 423 122 1 | 225 92 1 200 113 | 350 112 245 130 |

VICTORIA—PRICES OF WOOL—continued

Stock Slaughtered

The following table shows the number of slaughtering establishments and details of the stock slaughtered in the State during each of the five years 1955–56 to 1959–60 :---

VICTORIA—STOCK SLAUGHTERED

| | Stock Slaughtered in Establishments and on Farms and Stations | | | | | | | |
|--|---|---|---|---|---|--|--|--|
| Particulars | | Year Ended 30th June- | | | | | | |
| | 1956 | 1957 | 1958 | 1959 | 1960* | | | |
| | | | '000 | | | | | |
| Sheep Lambs Bulls and Bullocks Cows Young Cattle Calves Pigs | 3,968 3,892 238 268 135 383 395 | 3,518 3,521 284 269 141 445 382 | 5,500 4,123 271 394 180 559 473 | 5,940 4,573 256 441 173 527 462 | 7,623 4,888 215 367 199 497 458 | | | |
| Number of Slaughter- houses | 359 | 345 | No. 320 | 316 | 306 | | | |

* Average dressed weights per carcass during 1959-60 were : Sheep 44.41 lb.; Lambs 33.17 lb.; Bulls and Bullocks 611.28 lb.; Cows 417.49 lb.; Young Cattle 276.61 lb.; Calves 50.98 lb.; Pigs 114.32 lb.

Frozen Mutton and Lamb Exported

The importance of the mutton and lamb export trade to sheep owners is indicated by the export figures for the years 1955-56 to 1959-60 as shown in the table below :—

| | | | | | Mut | ton | Lar | nb |
|------|------|----------|--------|--|----------|-------|----------|-------|
| | Year | Ended 30 | h June | | '000 Ib. | £'000 | '000 Ib. | £'000 |
| 1956 | | | | | 21,434 | 1,293 | 50,450 | 4,756 |
| 1957 | | | | | 14,822 | 935 | 28,574 | 2,610 |
| 1958 | | | | | 24,694 | 1,335 | 35,193 | 3,227 |
| 1959 | | | | | 41,854 | 3,692 | 44,638 | 3,737 |
| 1960 | | | | | 47,512 | 3,203 | 29,440 | 2,036 |

FROZEN MUTTON AND LAMB EXPORTED FROM VICTORIAN PORTS

Honey Industry

Victoria's hardwood forests each year provide an important contribution to the wealth of the State by virtue of timber production for various purposes. However, one little known facet of our forest productivity is the annual harvest of honey taken from many species of eucalyptus in all parts of the State. Today, Victoria ranks second among the States in its apicultural activities.

With an average registration of some 1,250 apiarists and some 300–400 large commercial operators, Victoria's honey production averages about 7 mill. lb. per annum. Colony yields are relatively good and range between 180 and 240 lb. per colony per annum.

Eucalyptus species provide the bulk of the honey crop—up to 95 per cent. of the total—with the balance made up of clover and one or two minor species of ground flora.

The industry is, of necessity, migratory, whole apiaries with the necessary plant being moved by road transport from one part of the State to another following the flowering of the eucalyptus species in the forests. Hives, trucks, and plant have been designed and modified to suit the requirements of mobility demanded by the industry.

Pollination of agricultural crops is a further aspect of the industry which has received considerable attention. Each year thousands of colonies are hired out to fruit and seed growers to ensure profitable sets of fruit and seed.

Marketing is the great problem of the industry. Violent fluctuations in the annual honey crop are, in the absence of any organized marketing arrangements, attended by similar fluctuations in the prices of produce and, in some cases, considerable carry-over from one season to the next.

Governmental interest in the industry is authorized by the *Bees* Act 1958 and extends to disease control, advisory services and research into problems of apiculture.

538

Prior to the season 1936, the statistics of honey and beeswax were based on returns received from apiarists who were permanent occupiers of holdings of 1 acre and upwards. As a consequence, production was understated because of the exclusion of (a) hives on areas of less than 1 acre, and (b) travelling beekeepers who were not occupiers of rural holdings. Commencing with the season 1935–36, all beekeepers were required to furnish returns. The collection was further revised in 1958 to exclude apiarists with less than five hives. Particulars relating to apiculture for the five years 1956-60 are given in the following table :—

| VICTORIA—BEE-HIVES | , HONEY, AND |) BEESWAX |
|--------------------|--------------|-----------|
|--------------------|--------------|-----------|

| Season Ende | | Beekeepers* Hives | | uction | Gross Value | | |
|--|---|---|---|---|---|--|--|
| 31st May | Beekeepers* | | | Beeswax | Honey | Beeswax | |
| | No. | No. | lb. | lb. | £ | £ | |
| 1956 . 1957 . 1958 . 1959 . 1960 . | 1,268 1,341 1,086 1,145 1,217 | 104,122 101,736 104,265 100,953 104,767 | 7,010,387 8,215,350 5,884,381 7,624,037 9,660,937 | 78,482 89,749 67,431 85,743 113,526 | 438,149 590,478 429,069 532,094 599,480 | 25,507 28,888 20,721 24,383 29,091 | |

• Apiarists with 20 hives and over numbered 828 in 1956, 814 in 1957, 779 in 1958, 771 in 1959, and 818 in 1960.

Non-Rural Industries

Forestry

Forest Estate

The extent of Victoria's forest estate is shown in the section 'Alienation of Land' on page 472 of this volume and further information will be found on page 513 of the Victorian Year Book 1961.

Forests Output

The following table summarizes the total output of all species for the years under review :----

| VICTORIA- | -FORE | STS | OUTPUT | |
|-----------|---------|-----|--------|--|
| (2000 |) Cubic | Fee | t) | |

| Year Ended 30th June— | | | Sawn Timber* | Fuel Timber† | Pulpwood† | Miscel- laneous† | | |
|-----------------------|----|-----|-----------------|-----------------|-----------|---------------------|-------|-------|
| 1957 | | | | •• | 23,905 | 15,223 | 7,024 | 4,823 |
| 1958 | | | | | 22,670 | 12,300 | 7,061 | 6,160 |
| 1959 | •• | | •• | | 23,843 | 10,790 | 7,410 | 4,430 |
| 1960 | •• | ••• | •• | •• | 23,703 | 9,481 | 7,529 | 5,359 |

^a These figures are estimates of sawn timber obtained from the recorded volumes of logs cut. [†] Volumes estimated from recorded quantities in various units (e.g., tons, cubits, lineal feet, &c.). The continued steady decline in output of timber for fuel purposes indicates that this product, at least in the form in which it is being used at present, is losing ground in favour of substitutes. Having regard to this State's potential for power production from its enormous brown coal resources and the obviously increasing demand for wood for the cellulose and fibre industries, any expenditure on the sales promotion of wood as a fuel is of doubtful value.

The miscellaneous group in the preceding table includes such diverse items as telephone and electric supply poles, bridge piles and beams, fencing timbers, railway sleepers and mining timbers. So many factors, including temporary influences such as the recent introduction of full-length preservation of non-durable species of poles, fluctuations in market conditions for agricultural and pastoral produce, railway construction projects, &c., influence the demand for these items that output trends are obscured in the collective totals, but by and large the demand for wood products is being well sustained.

Traditionally, Victoria is not, and does not appear likely to be, an exporting State as far as wood products are concerned. It is more likely that the problem in the future will be meeting the ever-increasing home demand for all types of wood products except wood fuel.

Softwood Output and Plantations

The output of saw logs and pulpwood is summarized below :----

| | (000 Superi 10) | | | | | | | | | | |
|-----------------|-----------------|----|--|----|--|---|-------------------------------------|--|--|--|--|
| Year Ended 30th | | | | e— | | Saw Logs and Peeling Logs (H.L.V.*) | Pulpwood (Equivalent H.L.V.*) | | | | |
| 1956 | | | | •• | | 20,092 | 9,892 | | | | |
| 1957 | | •• | | | | 17,916 | 8,765 | | | | |
| 1958 | | | | | | 17,736 | 6,627 | | | | |
| 19 59 | | | | | | 19,505 | 9,195 | | | | |
| 1960 | | | | | | 22,319 | 10,763 | | | | |
| | | | | | | | | | | | |

VICTORIA—OUTPUT OF SAW LOGS AND PULPWOOD

('000 Super.' Ft.)

* Hoppus Log Volume. (See page 53 for definition.)

Continuous investigation is proceeding into the matter of accurate determinations of the maximum permissible annual cut from plantation areas.

Plantation areas were increased by the planting of 1,582 acres during the 1955–57 planting seasons. Following the liquidation of unproductive and burnt areas, total plantation acreages have been revised. The total net area of State softwood plantations at 30th June, 1960, was 49,798 acres, of which Monterey Pine (*Pinus radiata*) comprised 35,242 acres.
Privately owned softwood plantations continued to expand, the estimated total acreage at 30th June, 1960 being 55,600 acres.

The increased area has resulted mainly from the plantings of Australian Paper Manufacturers Limited which is endeavouring to meet an increasing demand for the long-fibred pulp produced from softwood timbers. At Dartmoor one of the largest sawmills in the State derives all its timber supply from private plantations which are managed on a sustained yield basis.

Private individuals continued to plant small areas of softwood as a long-term investment, and interest has been maintained by State schools in endowment plantations. Revenue from these latter areas, which now total some 1,800 acres, is available for the provision of school amenities.

Nurseries

In addition to several small nurseries attached to plantations, the Forests Commission maintained four main distributing nurseries to provide trees for its own requirements, and for planting by State schools and farmers in the rural areas of the State.

During the years 1957 to 1959, the total number of trees distributed from these nurseries was 3,619,885, or an average of about 1.2 mill. trees per year.

Telecommunications

The radio system consists of 33 fixed stations situated in major forest centres, 292 mobile and portable equipments in field use and a central station at Melbourne. Four automatic repeating stations and a mobile emergency station are provided to strengthen fire protection links during summer.

Fire Protection.

Because of its climate, vegetation, and topography, Victoria is recognized as one of the most fire hazardous areas in the world. Many disastrous fires have occurred since the first were recorded in 1851; 71 lives were lost in fires in 1939 (see pages 494–495 of the Victorian Year Book 1938–39) and 51 in 1944.

The Forests Commission is responsible for the prevention and suppression of fires in all State Forests, National Parks, and all alienated lands within 1 mile of the boundaries of State Forests and National Parks (except in the Mallee, lands under control of the Melbourne and Metropolitan Board of Works, and some urban fire districts). This sphere of responsibility is designated the Fire Protected Area.

The territorial units for fire protection are the 53 forest districts in the State. During the summer, fires are detected by an interlocking system of fire towers and lookouts augmented by aerial patrols. Communication is by radio and telephone. Each forest district holds a supply of fire equipment and reserves are held in Melbourne and selected country centres. In the event of major fires, men and equipment are transferred between districts as required.

Primary Production

The Commission maintains communications and fire research sections, and operates a radio laboratory and an equipment workshop for the development of maintenance and repair of radios and fire equipment.

The main features of forest fire legislation are the prohibition of the lighting of fires in State Forests and National Parks except with the permission of the Authorities or in accordance with strict rules; power for the Minister of Forests to prohibit the use of fire or to suspend forest operations in areas threatened with acute fire danger; and provision for the construction of dugouts, shelters and safety zones for the protection of human life within the fire protected area.

Forest Fires

The causes of fires attended by Forests Commission personnel in the period 1956–57 to 1959–60 were as follows :---

| C | Number of Fires— | | | | | |
|--------------------------------------|------------------|---------|---------|---------|--|--|
| Cause | 1956-57 | 1957–58 | 1958-59 | 1959–60 | | |
| Grazing Interests | 8 | 15 | 6 | 8 | | |
| Landowners, Householders, &c. | 158 | 139 | 103 | 141 | | |
| Deliberate Lighting | 66 | 76 | 62 | 91 | | |
| Sportsmen, Campers, Tourists | 36 | 76 | 33 | 58 | | |
| Licencees and Forests Workers | 15 | 25 | 18 | 19 | | |
| Smokers | 48 | 53 | 43 | 65 | | |
| Lightning | 24 | 29 | 59 | 100 | | |
| Tractors, Cars, Trucks, Locomotives, | | | | | | |
| Stationary Éngines | 56 | 42 | 39 | 33 | | |
| Children | 17 | 26 | 19 | 27 | | |
| Sawmills | 9 | 12 | 13 | 20 | | |
| Miscellaneous Known Causes | 40 | 80 | 39 | 107 | | |
| Unknown Origin | 87 | 54 | 31 | 59 | | |
| Total | 564 | 627 | 465 | 728 | | |

VICTORIA—CAUSES OF FOREST FIRES

The areas of State forest burnt in the years 1956-57 to 1959-60 were-

| 1956–57 | | 115,268 | acres |
|---------|---------|------------|-------|
| 1957–58 | | 218,072* | ,, |
| 1958–59 | • • | 250,515* | ,, |
| 1959–60 | | 1,201,433* | " |

* 1957-58 includes 156,644 acres of non-commercial forest area; 1958-59 includes 106,624 acres of non-commercial forest area; 1959-60 includes 1,065,850 acres of non-commercial forest area; 27,850 acres of National Parks were burnt in 1960.

Research

An outline of forestry research in Victoria is contained on pages 517–518 of the Victorian Year Book 1961.

General

Fisheries and Wildlife

Practical management of the fish and wildlife resources of Victoria is vested in the Department of Fisheries and Wildlife, which is responsible to the Chief Secretary for the administration of the Fisheries Act and the Game Acts, and for conservation, management, and research on native and introduced fishes, birds, and mammals.

The State Hatchery and Freshwater Fisheries Research Station is located at Snob's Creek, near Eildon. A wildlife research centre is in the process of being established at Lara, near Geelong. Fisheries and wildlife officers (enforcement staff) are stationed at sixteen country centres throughout the State, and three more country stations are proposed.

Marine Fisheries

One role of the Department is the management of the marine fisheries and research into the biology and ecology of important species of marine fish. Fisheries and wildlife officers are stationed permanently at key points along the coast and patrol vessels are maintained at a number of centres.

Fish production in Victoria is low compared with that in other countries, but management and the development of new methods are directed to raising the catch. Specialized techniques, including the use of aerial spotting, echo sounders and radar for locating fish, and two-way radio have been introduced by the industry. A cannery has been established to utilize certain fish species for which the fresh fish market demand is limited.

The Department provides scientific advice on fisheries management, and technological information on the development of new gear and fishing methods.

The Commonwealth Fisheries Office and the Department of Primary Industry are associated with the Department in the management of the commercial fisheries through complementary legislation. The Commonwealth controls fishing in the extra-territorial waters, and certain State officers are empowered to police the Federal Act. There is close co-operation with the C.S.I.R.O. Division of Fisheries and Oceanography and there is an annual Interstate Federal Fisheries Conference.

Freshwater Fisheries

Angling as a recreation is increasing in importance each year. Streams and lakes are stocked with trout from the State Hatchery, which is the largest in the southern hemisphere. The annual production of fish is rising. An advisory service is provided through the fisheries and wildlife officers located at inland stations, and a close liaison is maintained with the Victorian Piscatorial Council, the governing body of the angling clubs. An extensive programme of research is conducted by research officers stationed at the Freshwater Fisheries Research Station and at headquarters.

Attention is also given to important freshwater fish of the Murray River system, the Murray Cod and Golden Perch. The aim of this research is to maintain the natural stocks of these fish and to develop hatchery rearing techniques to provide native fish for the stocking of farm dams and virgin public waters.

Fisheries Statistics

The statistics of production shown below are in terms of recorded weight. In interpreting fisheries statistics, allowance should be made for the incomplete coverage. Returns are collected from licensed professional fishermen only, and as a result the published totals fall short of total fish production to the extent of the catch by amateur fishermen, the commercial catch by persons not licensed as professional fishermen, and unrecorded catch by professional fishermen.

The following table shows certain particulars about the fishing industry in Victoria for the years 1955–56 to 1959–60 :---

VICTORIA—FISHERIES: MEN AND BOATS EMPLOYED: QUANTITY AND GROSS VALUE OF TAKE

| | Вс | | Boats] | ats Employed Value | | | Recorded I | Production | | |
|--------------------------------------|---------------------|---------------------------------|---------------------------------|-------------------------------------|---------------------------------|--|---|---|---------------------------------|--|
| Year 30th | Ended June— | Number of Men | Number | Value Other | | s Fish | | Cray | fish | |
| | | | | £'000 | Plant £'000 | Quantity* | Value £'000 | Quantity* | Value £'000 | |
| 1956 1957 1958 1959 1960 | · · · · · · · | 885 930 937 929 897 | 683 703 699 690 657 | 616 685 732 1,002 1,165 | 143 166 171 215 198 | 9,334 12,244 11,233 9,864 12,748 | 756 1,203 1,099 1,185 1,726 | 1,026 1,164 1,230 1,294 1,500 | 115 176 186 231 300 | |

* Includes catch by Victorian fishermen in Tasmanian waters.

Wildlife in Relation to Other Natural Resources General

Early contributions to wildlife conservation in Victoria were restricted to legal protection for individual species of birds and mammals. However, with continued economic development of the State, this alone is not enough and now adequate areas of natural habitat, where the animals can survive, are being reserved and protected.

The Fisheries and Wildlife Department, through its Wildlife Research Group, has the function of investigating problems involving the conservation and management of the wildlife resource in harmony with other natural resources. The proper solution of these problems requires measures which, whilst safeguarding wildlife, do not prejudice other resource activities.

As land is cleared for industry or agriculture, animals are forced to retreat into the remnants of their habitat; and in these restricted areas there is a build-up to excessive numbers which at times spill over onto settled land. Sometimes man's activities may provide these animals with suitable food or living space which is readily accepted, but in either case the animals may then cause damage or loss to property or economically valuable resources.

Wildlife and Agriculture

The development of agriculture in Victoria has led to the clearing and settlement of most of the rich plains country which formerly provided grazing for large mobs of Grey Kangaroos. Now the animals are restricted mainly to the country where denser forests provide a meagre food supply. During the winter the forests can no longer feed the kangaroos that bred there in the previous season and the animals once again come out onto the farms in search of food, damaging fences and eating and trampling the young crops and pastures.

Biological work by the Department aims to assess the damage and its dependence on various factors within the life pattern of the kangaroo.

If kangaroos move about only within a restricted "range" they may be most efficiently controlled on the farms where damage occurs. If, however, they move over long distances it will be necessary to extend control back into the forest areas. The range of kangaroos is traced by marking individuals with brightly coloured collars and mapping the observations of their movements.

Marking animals for re-identification also provides information on age and breeding habits and the way in which populations are likely to change in size.

Experiments are conducted to measure the food requirements of kangaroos. This helps to assess the damage which results from invasion of crops and pastures, as well as the numbers of animals which can be safely maintained in the forests.

Deaths occur in dense populations from starvation and disease and the effects of these are also studied in order to control and conserve kangaroos in Victoria.

Kangaroos have been protected by law for many years, but permits are issued for farmers to destroy limited numbers on their farms when the kangaroos are causing damage. The provisions on the permits control the numbers killed and these provisions are modified from time to time to intensify or moderate the control in particular areas.

Not only kangaroos, but most of our wildlife species are now restricted to forest areas many of which are permanent State Forests. In general, these animals are retiring by nature and attract little attention, but some cause serious damage to other natural resources and control of these pest species is essential.

Wildlife and Forests

Possums are numerous throughout much of the timbered country of the State and their presence can be very beneficial, as they help to keep in check the mistletoe, a parasitic plant common in Australian forests. Under full protection the possums also increase to excessive numbers over a period of years and their feeding results in serious defoliation of hardwoods in many parts of Victoria. Such a widespread problem can only be countered by an extensive control method. A licensed hunting season achieves this and, at the same time, makes use of the commercially valuable possum skin, which is used in the fur and textile industries. Each year a State-wide assessment of the possum population and the forest damage is made before the introduction of a licensed season is considered, because licensed seasons are not held every year, but only when warranted. The taking of possums under licence is restricted to the winter months, so that the skins can be obtained in their best condition.

The softwood plantations that have been established in many parts of the State suffer a more seasonal attack, not only from possums, but from wallabies and native rodents as well. The damage in these forests consists of bark stripping which often results in complete girdling of the trees leading to death, with consequent great economic loss. The approach to this problem is control of the nuisance populations in the plantation by the use of poison. Before such a drastic method can be employed, a great deal of basic knowledge of the life histories and habits of the offending species must be obtained. A research programme is being conducted with the aim of gathering this information so that the control methods can be effective and, at the same time, of minimum risk to harmless wildlife co-existing with the pest species.

Wildlife and Water Supply

Wildlife in relation to water-supply can also present problems. The water-rat is a native rodent that has been protected in Victoria since 1943. This protection, probably combined with other factors, has brought about a great increase in water-rat numbers in the Murray and Goulburn Valley irrigation districts in northern Victoria. Here they cause damage to earth-works and irrigation installations by burrowing through and around them. The cost of repairing such damage is considerable.

Water-rat pelts are commercially valuable and several experimental licensed seasons have been proclaimed in past years. The aim is the management of the species as a fur-bearer, so that the removal of the surplus numbers provides a method of control, at the same time utilizing the rat as a valuable natural resource. Research has been carried out in order to obtain information on which to base control measures and this has involved a study of the life history and habits of the water-rat.

Many side effects must be considered in selecting any method of controlling excess populations and, where a valuable native species is involved, control must be related to a general State policy of wildlife conservation. Utilization combined with control is conservation and management at its best.

Further References

| Department | of Fisheries and | d Wildlife | -Fisheries Contribution |
|------------|------------------|------------|-------------------------|
| " | ,, | ,, | —Fisheries Circular |
| ,, | " | ,, | -Fauna Contribution |
| ,, | ,, | ,, | -Wildlife Circular |
| " | ,, | ,, | -Miscellaneous Paper |
| ,, | " | ,, | -General Circular |
| ,, | •• | ,, | -Newsletter (Moniny) |

Mining

Mining Development in Victoria

Mining has played a most important role in the history and development of Victoria. The discovery of gold in payable quantities was the event which had the greatest effect upon the history of the State. The search for gold first attracted migrants in large numbers and led to their permanent settlement. In September, 1851, a great alluvial goldfield was found at Ballarat and this discovery was followed by very rich gold strikes at Bendigo, Castlemaine, Stawell, Maryborough and other places. The revolutionary effect of this first gold rush was such that, from the start of the rush until 1858, the population rose from 70,000 to nearly 500,000. In the peak year of 1856, Victoria produced 3 mill. ounces and in the first gold decade it exported over 23 mill. ounces.

The gold mining industry was in large measure responsible for determining the pattern of the inland cities, towns, railways, and roads.

The emphasis today is, however, not on gold but on the fuel mineral—brown coal—from which is derived most of the energy indispensable to industrial expansion.

Coal

The most important mining events in the past few years have been the increase in the brown coal production to 14,982,990 tons in 1960, and the proposal of the State Electricity Commission to extend its already huge developments. Yallourn and Morwell are now among the world's major coal developments for electricity generation and the manufacture of briquette fuel. The area deposits are undoubtedly amongst the largest in the world.

The most extensive of Victoria's deposits of tertiary brown coal exist in the Latrobe Valley, 90 miles east of Melbourne. Tests have proved that here exist reserves of over 17,000 mill. tons of brown coal suitable for open-cut exploitation. The deposits have shaped the destiny of the Victorian economy since the end of the First World War.

Private producers are making some contribution to the amount of coal won. Roughly, this production was 4 per cent. of the total produced (579,326 tons in 1960), but the proportion is likely to increase through the development of newly discovered brown coal fields on the western side of Port Phillip Bay. These deposits will complement the eastern side deposits and are of comparatively easy access to the main points of consumption. They will particularly benefit the fast growing city of Geelong and will supply power for the aluminium refining plant to be erected there.

Bituminous coal was mined during 1960 at Jumbunna, Kilcunda, Korumburra, Mirboo North, and Wonthaggi, and brown coal at Bacchus Marsh, Morwell, Thorpdale, Yan Yan Gurt (near Winchelsea), Yallourn, and Yallourn North.

Mineral Production

The mineral production of the State, as recorded by the Mines Department, from lands occupied under the Mines Act (excluding stone raised in quarries, and salt) for the year 1960, and the aggregate mineral production up to 31st December, 1960, are shown in the following table :----

| Minerals | During | 1960 | Total to 31st December, 1960 | | |
|--|---|--|---|---|--|
| | Quantity | Value | Quantity | Value | |
| | fine oz. | £ | fine oz. | £ | |
| Precious Metals Gold Silver | 28,566 576 | 446,259 242 | 73,677,967 1,718,634 | 336,604,002 272,361 | |
| | tons | £ | tons | £ | |
| Other Minerals— Antimony Ore Bauxite Coal, Black Coal, Brown Diatomaceous Earth Fire Clay Fire Clay Gypsum Kaolin and Other White Clays Limeostone Limonite Tin Concentrates | $\begin{array}{r} 2\frac{1}{2}\\ 4,231\\ 77,995\\ 14,982,990\\ 5,394\\ 14,498\\ 7\\ 100,386\\ 689,148\\ 1,156,972\\ 1,153\end{array}$ | 925 16,678 417,660 6,844,749 7,343 13,035 161 98,075 553,413 634,569 7,435 | 34 70,304 22,022,550 202,500,081 15,382 4,155 1,119,039 14,895,790 18,915 | 5,040 157,341 24,728,705 49,966,450 166,468 * 18,241 880,048 * 1,468,089 | |

VICTORIA-MINERAL PRODUCTION

* Not available.

The following table shows the average annual production and value of black and brown coal for each of the five year periods from 1921 to 1955 and the production and value for each of the years 1956 to 1960 :—

| Period | | Black | Coal | Brown Coal | | |
|-----------|--|-------|------------|------------|------------|-------|
| | | | Production | Value | Production | Value |
| | | | tons | £'000 | tons | £'000 |
| 1921-1925 | | | 520,705 | 592 | 258,094 | 62 |
| 1926-1930 | | | 668,177 | 893 | 1,515,592 | 193 |
| 1931-1935 | | | 472,030 | 444 | 2,445,215 | 256 |
| 1936-1940 | | | 324,903 | 284 | 3,608,751 | 356 |
| 1941-1945 | | | 286.277 | 409 | 5,010,555 | 526 |
| 946-1950 | | | 156,290 | 361 | 6,648,430 | 1.202 |
| 951-1955 | | | 143,535 | 795 | 8,728,116 | 3,593 |
| 1956 | | | 118,827 | 668 | 10,559,801 | 4,644 |
| 1957 | | | 111,569 | 556 | 10,740,989 | 5,228 |
| 958 | | | 108,359 | 528 | 11,643,629 | 5,418 |
| 959 | | | 87,715 | 455 | 13,040,717 | 6,123 |
| 1960 | | | 77 995 | 418 | 14 982 990 | 6.845 |

VICTORIA—COAL PRODUCTION AND 'VALUE*

* Value of output at the mine.

548

Quarrying

Information in the following table has been obtained from "regular" quarries which are known to have a fixed plant and which are in permanent production. It is realized that there is considerable quarry production unrecorded due mainly to contractors who, requiring material from a source adjacent to the work for which they are suppliers, open up quarries for that purpose or exploit stone outcrops, mine tailings, &c. This work is usually only of a temporary nature.

VICTORIA—QUARRYING CONSTRUCTION MATERIALS*

| Year Ended | | Number | Ma | Approximate Value of | | | |
|------------|--------|---------|-----------|-------------------------|---------|-----------|-------------------------|
| 31st Dec | ember— | Returns | Bluestone | Sandstone | Granite | Limestone | All Quarry Products† |
| | | | cub. yds | cub. yds. | tons | tons | £ |
| 1955 | | 141 | 2,644,392 | 117,082 | 179,964 | 27,464 | 3,931,657 |
| 1956 | | 142 | 3,240,699 | 113,241 | 215,609 | 39,826 | 4,738,013 |
| 1957 | | 133 | 3,416,132 | 191,232 | 204,590 | 61,495 | 4,952,773 |
| 1958 | | 132 | 3,852,012 | 146,016 | 173,096 | 63,230 | 5,202,993 |
| 1959 | | 121 | 4,529,601 | 462,109 | 215,227 | 35,129 | 5,841,988 |

* Since 1952-53, limestone quarried for the manufacture of cement, lime, &c., has not been included in this table. It will be found in "Mineral Production" on page 548.

† Wholesale selling value of all quarry products (including sand and river gravel), exclusive of delivery charges.

Value of Production

General

The value of production as estimated in the following tables is based to a large extent on returns received annually from individual producers throughout the State. As a measure of total production it is incomplete, as it does not include the building and construction industry. It also omits factories employing less than four hands (unless power-driven machinery is used) and excludes agriculturists with holdings of less than 1 acre.

A detailed account of the period covered for individual rural industries is given on page 489. Except in the case of mining and quarrying, statistics for the non-rural industries refer to the year ended 30th June. Statistics for mining and quarrying relate to the year ended 31st December of the first year shown.

Gross Value

Gross value is defined as the value placed on recorded production at the wholesale price realized in the principal market. In cases where primary products are absorbed locally, or where they become raw material for secondary industry, these points are presumed to be the principal markets. Care is taken to prevent, as far as possible, all overlapping or double counting. The primary value of dairy production, in accordance with the above definition, is the price paid at the factory for milk or cream sold by the farmer ; the value added by the process of manufacturing into butter, &c., is included in manufacturing production.

| | | | | • • | | | |
|-------------|--------------|--------|---------|------------|---------|---------|--------------|
| Ind | ustry | | 1955-56 | 1956–57 | 1957–58 | 1958-59 | 1959-60 |
| Agriculture | | | 88,902 | 86,141 | 88,198 | 101,058 | 92,411 |
| Pastoral | | •• | 123,757 | 149,880 | 137,854 | 134,015 | 160,138 |
| Dairying* | | | 70,094 | 66,330 | 65,431 | 65,264 | 70,471 |
| Poultry and | Bees | | 21,394 | 21,464 | 23,266 | 22,263 | 24,691 |
| Trapping | | | 3,422 | 3,588 | 3,621 | 3,862 | 3,749 |
| Forestry | | | 12,668 | 13,134 | 14,109 | 15,441 | 16,969 |
| Fisheries | | | 871 | 1,381 | 1,294 | 1,433 | 2,045 |
| Mining | •• | | 10,916 | 11,891 | 12,728 | 13,694 | 14,935 |
| Total Prima | ry Indu | stries | 332,024 | 353,809 | 346,501 | 357,030 | 385,409 |
| • Testada | C 1 1 | 1 100 | | 000 . 1050 | | 1057 59 | FC (0C 000 · |

VICTORIA—GROSS VALUE OF PRIMARY PRODUCTION (£'000)

• Includes Subsidy—1955-56, £6,355,000 ; 1956-57, £6,286,000 ; 1957-58, £6,696,000 ; 1958-59 £6,223,000 ; 1959-60, £6,204,000.

Local Value

The gross value of production less costs of marketing (freight, cartage, brokerage, commission, insurance, and containers) represents the gross value of production at the place of production, that is, local value, details of which are shown in the following table :---

VICTORIA---GROSS VALUE OF PRIMARY PRODUCTION AT THE PLACE OF PRODUCTION

| Produce | 1955-56 | 195657 | 1957–58 | 1958–59 | 1959-60 |
|---|--|--|--|--|---|
| Agriculture | 75,580 | 72,947 | 74,933 | 85,451 | 79,130 |
| Barley | 2,523 | 2,829 | 2,710 | 3,375 | 2,042 |
| Maize | 116 | 60 | 130 | 114 | 113 |
| Oats | 2,984 | 2,307 | 4,072 | 4,716 | 3,573 |
| Wheat | 21,361 | 19,778 | 18,460 | 23,567 | 22,421 |
| Onions | 810 | 685 | 425 | 894 | 842 |
| Potatoes | 11,662 | 4,797 | 2,222 | 3,874 | 4,966 |
| Other Vegetables | 9,845 | 9,954 | 9,219 | 8,217 | 8,703 |
| Hay and Straw | 13,287 | 14,358 | 16,331 | 17,789 | 13,836 |
| Fruit— | | | | | |
| Orchards | 6,517 | 8,364 | 9,422 | 7,884 | 7,914 |
| Vineyards | 3,895 | 6,498 | 8,106 | 8,342 | 6,188 |
| Other Crops | 2,580 | 3,317 | 3,836 | 6,679 | 8,532 |
| | | | | | |
| Pastoral | 112.041 | 137.962 | 125.389 | 119.784 | 145.415 |
| Pastoral Wool | 112,041 61,917 | 137,962 89.652 | 125,389 68,520 | 119,784 51,786 | 145,415 67,758 |
| Pastoral Wool Sheep, Slaughtered | 112,041 61,917 20,490 | 137,962 89,652 17,341 | 125,389 68,520 20,865 | 119,784 51,786 22,375 | 145,415 67,758 27,766 |
| Pastoral Wool Sheep, Slaughtered Cattle, Slaughtered | 112,041 61,917 20,490 29,634 | 137,962 89,652 17,341 30,969 | 125,389 68,520 20,865 36,004 | 119,784 51,786 22,375 45,623 | 1 45,415 67,758 27,766 49,891 |
| Pastoral | 112,041 61,917 20,490 29,634 | 137,962 89,652 17,341 30,969 | 125,389 68,520 20,865 36,004 | 119,784 51,786 22,375 45,623 | 145,415 67,758 27,766 49,891 |
| Pastoral Wool Sheep, Slaughtered Cattle, Slaughtered Dairying* | 112,041 61,917 20,490 29,634 67,594 35,152 | 137,962 89,652 17,341 30,969 63,759 29,481 | 125,389 68,520 20,865 36,004 62,918 29,027 | 119,784 51,786 22,375 45,623 62,658 28,522 | 145,415 67,758 27,766 49,891 67,611 30,829 |
| Pastoral Wool Sheep, Slaughtered Cattle, Slaughtered Dairying* Cream for Butter Milk for Cheese | 112,041 61,917 20,490 29,634 67,594 35,152 2,557 | 137,962 89,652 17,341 30,969 63,759 29,481 3 921 | 125,389 68,520 20,865 36,004 62,918 29,027 2,973 | 119,784 51,786 22,375 45,623 62,658 28,522 3,650 | 145,415 67,758 27,766 49,891 67,611 30,829 4 329 |
| Pastoral | 112,041 61,917 20,490 29,634 67,594 35,152 2,557 | 137,962 89,652 17,341 30,969 63,759 29,481 3,921 | 125,389 68,520 20,865 36,004 62,918 29,027 2,973 | 119,784 51,786 22,375 45,623 62,658 28,522 3,650 | 145,415 67,758 27,766 49,891 67,611 30,829 4,329 |
| Pastoral | 112,041 61,917 20,490 29,634 67,594 35,152 2,557 6,229 | 137,962 89,652 17,341 30,969 63,759 29,481 3,921 6 085 | 125,389 68,520 20,865 36,004 62,918 29,027 2,973 6,520 | 119,784 51,786 22,375 45,623 62,658 28,522 3,650 5,979 | 145,415 67,758 27,766 49,891 67,611 30,829 4,329 |
| Pastoral | 112,041 61,917 20,490 29,634 67,594 35,152 2,557 6,229 11,510 | 137,962 89,652 17,341 30,969 63,759 29,481 3,921 6,085 12,050 | 125,389 68,520 20,865 36,004 62,918 29,027 2,973 6,520 12,243 | 119,784 51,786 22,375 45,623 62,658 28,522 3,650 5,979 | 145,415 67,758 27,766 49,891 67,611 30,829 4,329 6,667 |
| Pastoral | 112,041 61,917 20,490 29,634 67,594 35,152 2,557 6,229 11,510 5,701 | 137,962 89,652 17,341 30,969 63,759 29,481 3,921 6,085 12,050 52,050 | 125,389 68,520 20,865 36,004 62,918 29,027 2,973 6,520 12,243 59 | 119,784 51,786 22,375 45,623 62,658 28,522 3,650 5,979 12,744 | 145,415 67,758 27,766 49,891 67,611 30,829 4,329 6,667 13,122 |
| Pastoral Wool Sheep, Slaughtered Cattle, Slaughtered Dairying* Cream for Butter Milk for Cheese Milk for Condensing, Concentrating, &c. Ke. Whole Milk Consumed Pigs | 112,041 61,917 20,490 29,634 67,594 35,152 2,557 6,229 11,510 5,791 | 137,962 89,652 17,341 30,969 63,759 29,481 3,921 6,085 12,050 5,936 | 125,389 68,520 20,865 36,004 62,918 29,027 2,973 6,520 12,243 5,459 | 119,784 51,786 22,375 45,623 62,658 28,522 3,650 5,979 12,744 5,540 | 145,415 67,758 27,766 49,891 67,611 30,829 4,329 6,667 13,122 6,460 |
| Pastoral Wool Sheep, Slaughtered Cattle, Slaughtered Dairying* Cream for Butter Milk for Cheese Milk for Condensing, Concentrating, &c. Whole Milk Consumed Pigs Poultry and Bees | 112,041 61,917 20,490 29,634 67,594 35,152 2,557 6,229 11,510 5,791 19,771 | 137,962 89,652 17,341 30,969 63,759 29,481 3,921 6,085 12,050 5,936 19,787 | 125,389 68,520 20,865 36,004 62,918 29,027 2,973 6,520 12,243 5,459 21,373 | 119,784 51,786 22,375 45,623 62,658 28,522 3,650 5,979 12,744 5,540 20,486 | 145,415 67,758 27,766 49,891 67,611 30,829 4,329 6,667 13,122 6,460 22,686 |
| Pastoral Wool Sheep, Slaughtered Cattle, Slaughtered Dairying* Cream for Butter Milk for Cheese Milk for Condensing, Concentrating, &c. Whole Milk Consumed Pigs Poultry and Bees Eggs | 112,041 61,917 20,490 29,634 67,594 35,152 2,557 6,229 11,510 5,791 19,771 14,877 | 137,962 89,652 17,341 30,969 63,759 29,481 3,921 6,085 12,050 5,936 19,787 14,349 | 125,389 68,520 20,865 36,004 62,918 29,027 2,973 6,520 12,243 5,459 21,373 15,516 | 119,784 51,786 22,375 45,623 62,658 28,522 3,650 5,979 12,744 5,540 20,486 13,545 | 145,415 67,758 27,766 49,891 67,611 30,829 4,329 6,667 13,122 6,460 22,686 15,493 |
| Pastoral Wool Sheep, Slaughtered Cattle, Slaughtered Dairying* Cream for Butter Milk for Cheese Milk for Condensing, Concentrating, &c. &c. Whole Milk Consumed Pigs Poultry and Bees Eggs | 112,041 61,917 20,490 29,634 67,594 35,152 2,557 6,229 11,510 5,791 19,771 14,877 4,484 | 137,962 89,652 17,341 30,969 63,759 29,481 3,921 6,085 12,050 5,936 19,787 14,349 4,932 | 125,389 68,520 20,865 36,004 62,918 29,027 2,973 6,520 12,243 5,459 21,373 15,516 5,589 | 119,784 51,786 22,375 45,623 62,658 28,522 3,650 5,979 12,744 5,540 20,486 13,545 6,533 | 145,415 67,758 27,766 49,891 67,611 30,829 4,329 6,667 13,122 6,460 22,686 15,493 6,765 |

(£'000)

Inclusive of Subsidy—1955-56, £6,355,000; 1956-57, £6,286,000; 1957-58, £6,696,000; 1958-59, £6,223,000; 1959-60, £6,204,000.

| Produce | 1955–56 | 1956–57 | 19 57 –58 | 1958–59 | 195960 |
|---|--|---|---|---|--|
| Trapping, &c Rabbits and Hares Rabbit and Hare Skins, &c | 3,197 1,883 1,314 | 3,333 2,387 946 | 3,287 2,501 786 | 3,562 2,717 845 | 3,492 2,560 932 |
| Forestry Sawmills Hewn Timber Firewood Bark for Tanning Other | 11,823 7,621 926 3,118 158 † | 12,297 7,828 1,007 3,280 163 19 | 13,088 7,617 1,300 4,030 120 21 | 14,063 7,468 998 5,454 128 15 | 15,476 8,015 1,426 5,913 86 36 |
| FisheriesFishCrayfishOystersOther | 733 637 96 | 1,178 1,026 150 2 | 1,104 937 158 6 3 | 1,265 1,062 199 1 3 | 1,771 1,495 260 1 15 |
| Mining Gold Coal— | 10,916 640 | 11,891 653 | 12,728 736 | 13,694 694 | 14,935 585 |
| Black Brown Other Metals and | 815 4,382 | 668 4,644 | 556 5,227 | 528 5,418 | 455 6,123 |
| Minerals Quarrying | 1,148 3,931 | 1,188 4,738 | 1,256 4,953 | 1,851 5,203 | 1,930 5,842 |
| Total Primary Industries | 301,655 | 323,154 | 314,820 | 320,963 | 350,516 |

VICTORIA—GROSS VALUE OF PRIMARY PRODUCTION AT THE PLACE OF PRODUCTION—continued

(£'000)

† Not available.

Net Value of Production

The ultimate aim of the valuation of production is to arrive at the sum available for distribution among those concerned in each class of industry. These include :---

- (1) Workers in all grades of industry;
- (2) proprietors (including landlords) of any of the instruments of production concerned; and
- (3) providers of capital including debenture holders and mortgagees.

This represents the net value of production which is calculated by the deduction of costs of production from the gross value of production at the place of production. Such costs comprise stock feed, seed costs, manures, spraying, animal dips, fuel, power, water, and all other materials consumed in the process of production.

| | (~ | , 000) | | | |
|---|--|--|--|--|---|
| Division of Industry | 1955–56 | 1956–57 | 1957–58 | 1958–59 | 1959-60 |
| al— | 66 465 | 63 802 | 64 971 | 73 661 | 68 912 |
| istoral | 104.820 | 129.883 | 115,970 | 110,392 | 135,630 |
| airying | 54,301 | 47,933 | 46,153 | 44,382 | 47,469 |
| oultry | 12,618 | 12,506 | 14,042 | 12,572 | 14,636 |
| e-farming | 410 | 506 | 268 | 408 | 428 |
| Total Rural | 238,614 | 254,630 | 241,404 | 241,415 | 267,075 |
| -rural | 24,621 | 26,265 | 27,423 | 29,877 | 32,840 |
| Total Primary | 263.235 | 280.895 | 268,827 | 271,292 | 299,915 |
| ufacturing | 491,948 | 528,031 | 566,476 | 608,947 | 686,501 |
| I All Industries | 755,183 8 | 808,926 | 835,303 | 880,239 | 986,416 |
| II griculture griculture airying pultry xe-farming Total Rural -rural Total Primary pufacturing I All Industries | 66,465 1 104,820 1 54,301 1 12,618 410 238,614 2 24,621 2 263,235 2 491,948 3 755,183 8 | 63,802 (29,883 47,933 12,506 506 254,630 26,265 280,895 528,031 808,926 | 64,971 115,970 46,153 14,042 268 241,404 27,423 268,827 566,476 835,303 | 73,661 110,392 44,382 12,572 408 241,415 29,877 271,292 608,947 880,239 | 68,9 135,6 47,4 14,6 267,0 32,8 299,9 686,5 986,4 |

VICTORIA—NET VALUE OF PRODUCTION (£'000)