

CHAPTER ONE

The First Ten Years

The first meeting of the Central Agricultural Bureau took place on 10 April 1888 in the office of the Conservator of Forests.

Present were:



Albert Molineux

Albert Molineux, the instigator of this scheme, was born at Brighton, on the English coast, on 11 July 1832. He arrived in South Australia on the *Resource* in January 1839. He first worked on a farm at Klemzig before being apprenticed as a printer. In 1851 he moved to the Victorian gold fields where he dug for four years. He returned to South Australia and worked on his father's farm on the River Gilbert for a year. He then returned to his trade as a printer, but his love of rural life did not abate. He resuscitated the old publication *The*

Farm and Garden under a new title – the first issue of *The Garden and Field* appeared on 10 August 1875. He continued to publish this journal until 1891 when he was forced to give it up in order to devote himself full-time to the Agricultural Bureau. His influence on South Australian farming was enormous, as shall become clear in the following history of the South Australia Agricultural Bureau. Among the innovations he recommended were co-operative dairying, spraying of fruit trees and the use of superphosphate as a fertiliser. He was made a life member of the Royal Agriculture Society of South Australia and of the South Australian Zoological Society. His interests encompassed all of the natural world, and he constructed the first trawl net used for scientific purposes in South Australia. During the first week of its use 40 species of fish new to South Australia were discovered. The specimens secured by him led to the first exploration of the method of reproduction of the native porcupine (*Echidna hystrix*), and he helped secure the first perfect specimen of a pygmy whale (*Neobalaena marginata*) for the South Australian Museum. He was elected a Fellow of the Linnaean Society of Great Britain and belonged to the MacDonnell Lodge of Freemasons, Glenelg.

The Honourable F.E.H.W. Krichauff, M.P.

The Hon. F.E.H.W. Krichauff, M.P., was made the first chairman of the Central Bureau. Born at Schleswig, Germany on 18 December 1824, he graduated from the University of Kiel before coming to South Australia in 1848. His diploma in Horticulture and Floriculture was an asset when he took up farming near the Bugle Ranges. Then in 1854 he became a member of the first Macclesfield District Council. From this time on he devoted his energies to public life. He was elected as a Member of the Legislative Council. His work



there related to his original agricultural pursuits; his understanding of life on the land proved to be extremely useful in legislating to protect the interests of farming people. He assisted Sir R. R. Torrens in securing the passing of the Real Property Act. One of his major concerns was forest conservation. In 1870 he managed to gain Parliamentary sanction for his proposal to grant land orders to the value of two pounds per acre for those planting not less than five acres of forest trees. Soon after this he also managed to introduce a Bill whereby the Government could create reservations of forest lands and appoint a Forest Board (which later became the Forest Department). Throughout his career, Krichauff was a strong supporter of the Roseworthy Agricultural College, and was a member of the College Council for several years. He remained on the Central Bureau until it was dissolved in 1902 to form the Council of Agriculture, of which he was made a life member. During this time he was always a strong advocate for improvements in methods of cultivation and the use of fertilisers in South Australian farming; by the time of his death on 29 September 1904, he had seen great advances in both.

Sir Samuel Davenport

Sir Samuel Davenport was born on 5 March 1818 in Oxfordshire, England. He came to South Australia in 1843 and settled at Macclesfield where his brother had previously bought land and given the area its name. Here he engaged in agricultural and horticultural pursuits. He also ran sheep on

his land in those early days. In 1845 he was one of the first settlers to cross the River Murray, taking up the Rivoli Bay run of 110 square miles. In 1846 he was appointed to the first Legislative Council of South Australia, and spent over 20 years in South Australian politics. During this time he was twice made a Minister of the Crown. His public duties ranged far beyond that, however. He was a prominent member of the Royal Agricultural and Horticultural Society and was President of this body for a number of years. He was also the first President of the Chamber of Manufactures, continuing in that role for nearly 20 years. His particular interest lay in growing vines, olives and other fruit in South Australia. To this end, he started a vineyard and olive plantation at Beaumont in the Adelaide foothills. In 1850 he accompanied an exploring party headed by Major Warburton. The expedition took in the area between Streaky Bay and Lake Gairdner on Eyre Peninsula, and the Gawler Ranges inland. He travelled extensively overseas in order to represent South Australia at international exhibitions. Through such efforts, the resources and potential of South Australia became known in the outside world. At the age of 68 he was made a K.C.M.G. in recognition of his services to his adopted country. His ability was also recognised by Cambridge University which accorded him an LL.D. Although his official connection with the Agricultural Bureau of South Australia was severed in 1902 with the formation of the Council of Agriculture, Sir Samuel Davenport's devotion to the interests of agriculture continued until his death on 3 September 1906.



William Austin Horn

William Austin Horn was one of the few native-born Australians on the Central Bureau. He began life in New South Wales in 1841, and came to South Australia with his family at the age of nine. He was educated at St. Peter's College, Adelaide, then Worcester College, Oxford. On returning to South Australia, he had a sheep run for 10 years, and eventually became one of South Australia's biggest pastoralists. In 1861 he was intimately concerned with the discovery of copper at Moonta, and was an original shareholder in the Moonta Mine. He also held extensive interests in the Silverton Mines on the Barrier, Broken Hill Proprietary Co. and the Mutooroo Copper Mines. He entered political life in 1887 as the representative for Flinders in the House of Assembly. From that time he spent six years as a member of Parliament. During his terms, he was concerned with the introduction of coloured labour on plantations and other semi-tropical industries in the Northern Territory, but his Bill was defeated. His philanthropy was never more evident than during the terrible drought of 1892-3. The Government refused to provide a subsidy for seed-wheat, so Horn decided to supply the same to all the needy in his constituency. He also equipped the Horn Scientific Exploration Expedition to Central Australia in 1894. In a further act of generosity, he donated his own collection of 11,000 coins, some of them dating back to Roman times, to the South Australian Museum. From 1894-1907 he spent most of his time in England where he was a Director of the Bank of Adelaide in London. He



finally returned to Australia where he remained for the rest of his days. His contribution to agriculture was just one part of a life devoted to the progress of the whole of South Australia.

R. Homburg, M.P.

R. Homburg, M.P. was born at Brunswick on 10 March 1848. His family was of German extraction, but he was himself a British citizen. In 1854 his family emigrated to Victoria, and then moved on to South Australia in 1857. He began his legal career in 1868 when Sir J. P. Boucaut offered him a position as an articled clerk. Later he moved to Tanunda in the interests of his profession, believing that here he would have greater opportunities than in the city. Homburg was admitted to the Bar in 1874 and began a very admirable life in South Australia's legal world. Ten years later he was elected as the representative of the District of Gumeracha. His Parliamentary work continued until 1905, during which time he was elected six times as Member of Parliament, first for the District of Gumeracha, as already stated, then for the District of Murray when the electorates merged in 1902. He was given the portfolio of the Attorney General in the Playford Government of 1890-92, and the Downer Government of 1892-3. Then he was a member of the Jenkins Administration from July 1904 until his judicial appointment. Upon being made a judge in February 1905 he was obliged to give up his Parliamentary work. During his time in office, Homburg was involved in many significant decisions. Most importantly, his achievements included Acts amending the Real

Property Act, Bills of Sale Act, Agricultural Holdings, National Parks, Partnership, Companies Consolidation, School of Mines and Industries, Probate and Administration Acts. Although he was not a practical agriculturalist, Homburg spent much of his life in rural areas and in representing country people had come to a sound understanding of the difficulties they faced. His experience in legislation was of undoubted benefit to the Central Bureau as they set about improving the lot of those on the land.



Dr R. Schomburgk

Three of the men on the Central Bureau were appointed by virtue of their positions in the Public Service. Dr R. Schomburgk, also of German background, was Director of the Botanic Gardens at the time. He was born at Frieberg in Saxony in 1811. He studied Botany in his native country, and on completion of his formal education was attached to the Imperial Gardens at Potsdam. Here he became proficient in his field, but the call of the pioneering spirit was too great for him to resist, and in 1848 he emigrated to Australia. He settled on the Gawler River and pursued his interests in farming and viticulture there for 17 years. His talents were soon recognised by others in the new colony, and he was appointed Director of Adelaide's Botanic Garden in 1865. He retained this position until his death in 1891, when Mr M. W. Holtze took over the responsibility. During his time as Director, Schomburgk was instrumental in introducing many new species to South

Australia, for both agricultural and domestic purposes. Experiments were carried out to determine which species were suitable for the climate here. New varieties were developed under his supervision. Perhaps one of the most important aspects of his experimental work, as far as the Central Bureau was concerned at any rate, was in relation to rust-resistant wheats. Some advances were made, but due to limited space these experiments could only be considered of preliminary significance. It was necessary to run trials on a larger scale before conclusive evidence was guaranteed. Later this role was absorbed by the Government Experimental Farms set up in different parts of South Australia. In the meantime, however, the Botanic Gardens served as a place to begin experimental work, pointing the direction for further trials which were likely to prove profitable on a commercial scale.



John Ednie Brown

Mr John Ednie Brown was Conservator of Forests when the Bureau was formed, so he was appointed to the Central Bureau. Educated in Edinburgh, his interest in forest trees began at an early age. He chose to follow a career in the practical management of nurseries and forestry. In order to do this, he obtained a position at Invergould Estate in Aberdeenshire, Scotland. Here he learned his profession as assistant agent and forester. He travelled extensively in the U.S.A. and Canada before settling in South Australia, arriving here in September 1878 on the *Garonne*.

In many publications on his subject, Brown developed a fine reputation. He was awarded a Gold Medal by the Highland and Agricultural Society of Scotland for his article *Report upon Trees found in California*. His writing continued upon returning to Australia; two of his most admired works were *Tree Culture in South Australia* and *The Forest Flora of South Australia*. In 1878 he was appointed Conservator of Forests for South Australia. He continued in this position until 1891 when Walter Gill took over from him. Brown accepted the position of Director General of Forests in New South Wales. In his public role he taught South Australians to take care of their natural forests, stressing their importance in protecting the land from erosion. He was instrumental in the planting of Government forests for timber sources. Clearly South Australia would soon run out of good building wood if measures were not taken to replace natural timber resources. In 1895 the Bureau of Agriculture in Western Australia engaged him to examine its forests in order to determine the quantity of marketable timber there. The following year he became Western Australia's first Conservator in the Department of Woods and Forests. His contribution to his field was recognised by the Linnaean Society which made him a Fellow, as did the Royal Horticultural Society.



Professor William Lowrie

Professor William Lowrie was appointed as the third official member of the Central Bureau. He

was born in 1859 near St Boswell, in Roxburghshire in the UK. Lowrie was recognised as a brilliant pupil during his education at Edinburgh University. On completing his degree he took a position as lecturer in Natural Science and Agriculture at Gordon College, Aberdeen. At the age of 29 he arrived in South Australia on 29 December 1897 to replace Dr John D. Custance, South Australia's first Professor of Agriculture. Lowrie immersed himself in his work as Principal of Roseworthy Agricultural College and the Professor of Agriculture. Over a year had passed between Dr Custance's leaving and Professor Lowrie's arriving, and the College had been allowed to go to ruin. However, Lowrie's enthusiastic work soon had everything running smoothly once again. Unfortunately for South Australia, a better opportunity presented itself in New Zealand, and Lowrie resigned in September 1901. In the following 10 years he lectured in New Zealand, then went to Western Australia when he was offered the position of Director of Agriculture there. The South Australian agricultural community realised they had let an excellent teacher and administrator escape from them, and determined to make amends in 1911. Professor Lowrie was invited to become South Australia's first Director of Agriculture. He accepted with pleasure, and once again took up his duties in South Australia on 1 March 1911. He remained in this position until July 1914 when he retired and Professor Perkins took his place. During his career in the public service, Professor Lowrie had been concerned with all branches of agriculture. He wrote many influential papers on a variety of subjects, and was instrumental in bringing about the introduction of new technology. However, despite his advanced approach to agricultural methods, he was always careful to maintain a certain amount of caution, insisting that innovations be commercially viable and more profitable than the old ways, before allowing their introduction.

Henry Kelly

Henry Kelly came to South Australia in 1840 with his widowed mother, five brothers and six sisters from Glasgow, Scotland. At the time he was 14 years old. The family took up land at Mount Barker. Despite knowing nothing of farming, the brothers put in one of the first wheat crops in the district. They paid 30s/bushel for Tasmanian seed wheat at the Port Adelaide wharf in September 1840. It was a good year and they reaped a reasonable crop, but were forced to wash off the smut covering the grains before it could be sold. The following year they tried pickling the wheat,



Charles J. Valentine was born in Sussex, England in 1834. He emigrated to Victoria in 1852, but decided to settle in South Australia the following year. He chose the South-East and embarked on a life as a pastoralist. In 1865 he was appointed to the position of Chief Inspector of Sheep, for which he was eminently qualified after his years of experience in Australia. He was also an official member of the Government enquiry into the losses sustained in the terrible drought of 1864-5, along with the Hon. C. Bonney and Mr Wentworth Cavenaugh, M.P. Then, when the Brands Act was passed in 1879 he became the Registrar of Brands. South Australia had several Stock Acts, which were finally consolidated by a Parliamentary Bill passed in 1888. Under this new arrangement, Valentine was made Chief Inspector of Stock, a position he retained for many years thereafter. In July 1905 he was obliged to retire from the Public Service under the Septuagenarian Act. Despite a petition asking that his services be retained for another year, he felt he had spent enough time on his public duties and bowed out.

but used such strong chemicals that the crop failed to come up. In 1846 Kelly imported a threshing machine from Scotland which saved the brothers a lot of hard work. He was also closely involved with John Ridley who developed the stripper for harvesting wheat in 1846. Henry Kelly bought the first one for £160. Within five years, these machines would be used by nearly everyone reaping wheat in South Australia. Then in 1851 he visited the Crystal Palace Exhibition in London and returned home with a McCormack mowing machine. These machines would become standard equipment on many South Australian farms in following years. In 1856 Kelly bought land at Kapunda and farmed there for 21 years before moving to Glenelg. In 1858 he was made a Justice of the Peace. With a reputation as a hard worker and innovator, Kelly was an obvious choice for the Central Bureau. He could balance the opinion of scientific experts such as Lowrie and Schomburgk, and was capable of sorting out significant problems from minor ones. His exposure to ordinary farms in the course of his own work left him in good stead to explain these concerns to the experts. It was by including such a practical farmer that the Central Bureau hoped to be of real service to agriculture in South Australia.

Later in the first year of its existence, two more appointments were made to the Central Bureau. Thomas Hardy, 4 March 1889 and C. J. Valentine, Chief Inspector of Stock, 10 September 1888.

Thomas Hardy was born in 1830 in Devon, England. He came to Australia on the *British Empire* at the age of 20 and spent his first year here working for John Reynell. When the opportunity to work on a cattle property at Normanville presented itself, he eagerly accepted the position and later joined a butchery business. Then gold was discovered and he drove cattle to the Victorian diggings, no doubt making a handsome profit for his trouble. On returning to South Australia in 1853, he bought a property at Bankside on the River Torrens, about three miles from Adelaide. Here he planted three-quarters of an acre of Shiraz and Grenache grapevines and two acres of fruit trees. In 1857 he sent the first vintage to England. Hardy had hit upon a very successful venture and was to become one of Australia's largest producers and shippers of wine. In 1863, he enlarged his plantings to 35 acres of vines, then in 1874, bought a disused flour mill at McLaren Vale. Two years later, he acquired the adjoining Tintara vineyard, and in 1884, enlarged the holding by a further 480 acres. By 1885, Hardy had 40,000 gallons of wine maturing. His business continued to expand, and in 1901 he owned 540 acres of vineyards, stores at Mile End and cellars in Currie Street. He pioneered the growing of currants and raisins in South Australia, encouraging others to follow his example. He was deeply committed to the advancement of his adopted land and took a role in public life to assist its progress. In 1889 he joined the Phylloxera Board and was President of

the Wine Growers' Association in 1891. He also held the position of Vice-President in the South Australian Horticultural Society and the Chamber of Manufactures. When the Bureau of Agriculture was formed, he intimated that he would be interested in helping their work by answering any queries related to vinegrowing and wine production.

Together these men hoped to encourage improvements in all forms of agriculture in the colony now 52 years old. The aims and constitution were reported to the public.

The Bureau shall consist of nine or more members, and be designated *The Central Agricultural Bureau of South Australia*.

The Bureau shall have power to nominate corresponding district bureaux.

The Bureau will collect and publish by means of the Press, and with the aid of the district bureaux, information of every kind calculated to prove beneficial to the colonists engaged in agricultural, horticultural, pastoral, and other pursuits connected with the cultivation of the soil, such as –

- (a) The suitability of the various districts of the colony (in regard to soil, situation, elevation, aspect, etc.) for the growth or production of plants, animals, etc.
- (b) Information obtained respecting plants, animals, products, etc., likely to prove of value to cultivators.
- (c) The best methods of cultivating various kinds of crops, and of breeding and feeding domestic animals, and of improving the same.
- (d) The methods of preparing and preserving various products for market, and discovery of markets for the products of the soil.
- (e) The collection of agricultural statistics, particularly as affecting the area under cultivation in each district; the number and breeds of animals; the nature and condition of crops during each month; the time of sowing or planting and harvesting; the average yield per acre of fruits, cereals, etc.; the cost of cultivating each kind of crop; and all information that might serve to guide intending settlers.
- (f) The collection of information respecting all kinds of pests affecting the farm, forest, garden, orchard, and vineyard.
- (g) To ascertain and suggest the best means of eradicating poisonous plants, and of combating the effects of disease of the ailments of domestic animals.

(h) To prevent as far as possible the introduction and spread of such pests, and to induce colonists to give the earliest information concerning the appearance of previously unknown plants, or parasites upon plants, or of diseases of animals, in order that the same may be at once identified and dealt with.

(i) To publish when necessary bulletins, abstracts, and reports containing all such information as may be deemed desirable.

(j) The district bureaux to be asked to give every assistance in their power in aid of the objects of the Agricultural Bureau. (*South Australian Parliamentary Papers 1889*, Vol. 3, No. 96, p. 1.)

The weekly meetings soon became too much, and the Central Bureau decided to meet fortnightly. Later this was altered to monthly meetings.

Soon branches of the Agricultural Bureau of South Australia were formed in rural areas, under the supervision of the Central Bureau. All branches and proposed members had to be approved by the governing body, and could have a maximum of nine men on the committee, although visitors were welcome at all meetings. On 21 May 1888, the Central Bureau officially approved the branches applying from Burra, Mannum, Nuriootpa and Stansbury. Many others soon followed – Millicent on 6 June, Gumeracha and Kanmantoo on 9 July, Gladstone on 13 August, Davenport on 17 September and Mt Gambier on 8 October. By the time the Agricultural Bureau had been established for 12 months, the number of branches had risen to 12 with the addition of Pt Germein on 1 April 1889 and Naracoorte on 6 April of that year. [Of these, Gumeracha is the only one to have continued to the present day without breaks or alteration. Millicent and Nuriootpa (now known as Angaston) are still functioning.] At this rate it looked as if the Agricultural Bureau was to be a success, filling a gap in the education of farmers and answering a great need. With branches forming across the State it would be possible to disseminate information throughout the colony of South Australia, realising the primary aim of the Bureau. It is interesting to note that most branches arranged to meet on a particular day "on or before the full moon" each month. In the days of horse-drawn vehicles travelling at night was difficult. The extra light shed by a full moon made all the difference. This arrangement continued until cars with powerful headlights were in common use.

In that first year a great many topics were discussed by the members of this new organisa-

tion. Seeds of both native and imported plants were sent out to the branches for experimental purposes. Some were successful, others a complete failure. In August the Central Bureau sent packets of hemp, *Soja hispida* (for producing soy sauce), lupins, saintfoin, buckwheat, *Ornithopus sativus*, lentils and tagosaste (a fodder plant from the Canary Islands). Supplies of seed for the grass Napier Fescue were also available for those requesting samples. In return, the branches sent back reports on the success or otherwise of these introduced plants, as well as plants and insects they did not recognise and would like to have identified. Branch members also described diseases they observed in their crops and stock, in the hope that the Central Bureau could supply names and remedies for them. In many ways, the Central Bureau was more like today's Department of Agriculture than the current Advisory Board.

In working to establish the best species for farming in South Australia, the Bureau also recommended diversification on farms. It seemed essential in remote areas, and in times of uncertain returns, for farms to be as self-sufficient as possible. With room to grow fruit trees, plant vegetable gardens and keep hens and a cow, it seemed only sensible to supply the family's needs as far as was practicable. And who knows, there may have been a little left over for sale to supplement the rather meagre income which was the lot of most early settlers. A number of different jobs about the farm also had the added attraction of creating a bit of variety in the year's work.

Beekeeping was particularly encouraged, to the extent that lecture tours were arranged. In October 1888 Mr A. E. Bonney spoke on the subject at Clarendon, Willunga, Meadows, Macclesfield, Strathalbyn and Mt Barker. He continued for several months, spreading practical information in the hope that farmers would take up this useful occupation.

Farmers were also encouraged to grow wattle trees, since it had been discovered that the timber and bark of this native was very good for tanning leather. Mr A. L. Thrupp gave an informative paper entitled *Notes on Wattle Culture* in May of 1888, and the Burra Branch also discussed this topic in June of the same year.

One of the earliest stock diseases to be discussed by the Bureau was coast disease. At the July meeting of 1888, Sir Samuel Davenport recommended a mixture of one part sulphate of iron to 20 parts salt placed in a trough or similar container as a successful remedy. Later that year a Mr W. Thompson of Victoria wrote to the Bureau

promising a cure for the same disease on payment of a reward.

However, no action was taken and the same remedy (though at double strength) was recommended by the Colton Branch in 1892, when they also suggested washing the heels of animals with soap and water then keeping them dry as a further precaution.

Another problem faced by the Bureau in its earliest days was the damage caused by increasing numbers of sparrows. The "Sparrow Pest at Kapunda" was on the agenda for the Central Bureau meeting of 25 June 1888, then Molineux gave a paper on the subject in July. Much of his information and advice was gleaned from the work of Miss Eleanor A. Ormerod, the Consulting Entomologist to the Royal Agricultural Society of England. She had recently visited the colony and was a rich source of information. Poisoned wheat appeared to be one of the fastest ways of dealing with the problem.

THE TRUE REMEDY FOR SPARROWS

By the Adelaide Poet Laureate.

What means this sadly plaintive wail,
Ye men of spades and ploughs and barrows?
Why are your faces wan and pale?
It is the everlasting sparrows.

We may demolish other pests
That devastate the farm and garden;
But spoiled by these voracious guests,
Our prospects are not worth a farden.

We can't defeat a foe like this
With gunshot or with bows and arrows;
We must resort to artifice
To cope with enemies like sparrows.

Our level best we all have tried
With scarecrows, nets and cunning cages,
Our utmost efforts they deride,
And spoil our fruit in all its stages.

Lift up your heads, your hearts lift up,
Resume your spades, your ploughs and harrows,
And while you drain the genial cup
I'll tell you how to lick the sparrows.

No more your wasted fruits bewail,
Your crops destroyed of peas and marrows,
A cure there is that cannot fail
To rid you of the hateful sparrows.

The remedy is at your feet
Slay them and wheel them out in barrows,
Poisoned by FAULDING'S PHOENIX WHEAT,
The one great antidote to sparrows.

(*Garden and Field*, September 1888 p. iii)

However, it did not take long for people to realise that this method also killed other birds which were in fact useful for controlling the insect population. It was not until April 1894 that the following amendments to the Sparrow Act were recommended by the Central Bureau on behalf of all Bureau members. "The Act should be compulsory, and not permissive; and also that it should apply to all buildings and erections, public as well as private", also that "provision should be made to apply the Act to starlings as well as sparrows, and for payment for their destruction at minimum rates of one halfpenny per head, and 2s 6d per 100 for eggs." (*Garden and Field*, May 1894, p. 362.)

On 28 January 1889 A. Molineux became the first permanent, paid General Secretary of the Central Bureau. It was a position he was to hold until 1902, despite several threats of resignation. In fact, the first of these occurred in February, only a fortnight after accepting the office. He was criticised for continuing his own private work, that is, as editor of the *Garden and Field* whilst being employed as a Government officer. However, his connection with the journal was useful to the Bureau. Previously the business of the Bureau had been reported in the columns of this magazine, but in January 1889, the rapidly growing organisation was sufficiently active to warrant its own publication, *The Journal of the Bureau of Agriculture*, which was to be distributed as a supplement to the *Garden and Field*. Copies of the new journal were also sent to all members of the Bureau. In October it was discovered that this was not in accordance with postal regulations and the format of the Journal was altered. Instead of being an insert, it was published as a portion of the normal paper.

In January 1889 the idea of establishing an Arbor Day was discussed by the Central Bureau. Mr J. E. Brown, the Conservator of Forests, suggested 20 June as a suitable date, and recommended that "everyone able to work should plant a tree upon that day". (*Journal of the Bureau of Agriculture*, May 1888, p. 42 hereafter referred to as JBA) The idea was received with enthusiasm by the branches, although the date was altered in some areas to a more appropriate planting time. Working in co-operation with district councils and schools, the Bureau was responsible for the planting of many trees in public places. This was to become part of every schoolchild's year.

A perennial topic of conversation amongst farmers is rainfall and in South Australia this generally tends towards the lack of it. So it was with the earliest members of the Agricultural Bureau. In September 1888 the Central Bureau

reported that "A Danish savant had formulated a theory to account for the existence of drought in certain districts as owing to a lack of trees and plants, which evaporate a sufficient quantity of moisture to lighten the atmosphere." (JBA, October 1888, p. 53). The idea was elaborated by Mr W. Brown, a Professor of Agriculture from Ontario, U.S.A., which was also reported to the Central Bureau. "I am of the opinion that leaves not only exhale, but act as sponges under given conditions" he stated in his paper "Evaporation of Plants". (JBA, November 1888 p. 66) He recommended the planting of limes, sycamores, maples, oaks, beeches, elms, ash, birch and catalpa. The trees of least benefit are walnut, spruce, pines, gums and all indigenous varieties, which is tantamount to listing all trees that grow readily in South Australia. The search for means of artificially creating rain continued, and an interesting paper at the Third Congress in 1891 points to the phenomena of heavy rains observed after battles. Molineux read a paper by Mr J. Miller of Adelaide outlining the method for putting this to a practical use.

I have great pleasure, as being the inventor of the system now being tried (and said to be successful) in America, in calling your attention, briefly, to some very important facts . . . I found in the course of my reading that it had been observed from the first use of gunpowder on the field of battle that whenever there was much cannonading, heavy rains almost invariably took place, either at the time or immediately afterwards, even when there were no previous atmospheric indications of rain . . . The method I suggest is to construct small balloons of cheap, light material, such as calico or thin glazed paper, capable of carrying say 20 lbs of dynamite, fitted with a time fuse, to explode when attaining any desired altitude. A balloon to carry this weight to a height of say two miles will probably have to be seven or eight feet in diameter, by some fifteen feet high, if charged with hydrogen or coal gas. (*Garden and Field*, October 1891, p. 109.)

If only it were possible to break a drought so easily!

Linked to the effects of rainfall is the threat of summer bushfires. South Australian farmers were aware of the possibility of devastation from the beginning of life in this land, and looked for ways of combating this danger. In answer to a circular sent out to branches by the Central Bureau in the summer of 1891-92, most felt it necessary to plough a firebreak around wheat crops, a practice continued to the present day. The Melrose Branch

echoed the sentiments of many settlers in its distrust of Tandsticker and wax matches.

The Melrose and some other branches have called attention to the dangers arising from the use of matches other than those termed "safety", and urge that the use of such dangerous matches should be discouraged by legislation and other means. The sale of wax matches in the streets of Adelaide by children is a source of danger to women, because the children and others frequently throw the matches on the pavement, where they ignite when trodden upon, and set fire to the under-clothing. Bushmen and smokers object to safety matches, because they will not strike on their trousers, and it would be necessary to carry the box upon which to strike them; but the dangerous nature of the Tandsticker and wax matches should justify the Legislature in submitting smokers to the slight inconvenience of using safety matches only. (*JBA*, February 1892, p. 181.)

The following summer, further recommendations were suggested by the Hahndorf Branch. It seemed more useful to allow District Councils to declare fire ban days rather than making a state-wide decision, since conditions varied so much between areas. Today District Councils declare the start and end of the burning off season in their own areas, but fire ban days are decided by a central body.

The question of harvest leave for schoolchildren was brought up at a Central Bureau meeting towards the end of 1890. Since children were obliged to attend only 35 days of school per quarter, it was considered that they should be able to arrange enough time off to help on the farm without taking special time off as well. Several years later it was suggested that the school terms should be rearranged to allow children holidays during the busiest times on the farm.

Molineux tendered his resignation again in October 1890. His complaint was one often uttered by secretaries since – there was too much work for too little recompense. Recognising his enormous contribution to the successful running of the Bureau, the Government of the day managed to find extra funding. His pay increased from £140 to £400 per annum. His lot was not to be an easy one, for a few months later he was again criticised for his connection with the *Garden and Field*. In reply, Molineux sent the following letter to the Bureau Chairman.

I have most respectfully to inform you that the Government in Cabinet have decided not to

allow me to conduct the *Garden and Field*. I beg most respectfully to draw your attention to the following facts:

1. The *Garden and Field* is purely and distinctly an auxiliary to the work of the Bureau.
2. The proceedings of the Bureau and its Branches are published in the *Garden and Field* free of cost to the Bureau, except the charges made by the printers for mechanical work.
3. All the valuable information collected and published each month is collected and written out of office hours, much of it being written by specialists.
4. None of the commercial part of the work is conducted by myself. Clerks and collectors do all the bookkeeping and collecting.
5. The present value of the *Garden and Field* is £1,000.
6. I have conducted the paper for sixteen years, and as it is the only one of the kind in Australasia it is much valued by agriculturists and horticulturists. (*Garden and Field*, March 1891, p. 149.)

The decision was final, and Molineux was obliged to hand over the *Garden and Field*. Mr W. C. Grashy became the new Editor from June 1891. The Central Bureau attempted to keep in close contact with all of the branches, not only through correspondence, but also by visiting different agricultural areas. Thomas Hardy visited the Pt Germein Branch in October of 1890 and recommended the cultivation of vines and dairying in the area. He then went to the South-East in February of the following year. Here he found country between Penola and Naracoorte which he thought looked very suitable for growing champagne grapes. The good rainfall, water near the surface and limestone rises were ideal. He recommended planting "Pineau Noir . . . Cabernet Sauvignon, Malbec and Shiraz". (*JBA*, February 1891, p. 133.)

In March 1891 the Central Bureau visited southern Yorke Peninsula, and then in June of that year they travelled to the newly settled areas of Renmark and Mildura. Another journey, this time to Angaston and the surrounding district, was undertaken by the Central Bureau in January 1892.

Their purpose was to inspect the results of spraying experiments carried out by Mr F. C. Smith, Mr A. B. Robin, and Mr W. Sage (members of the Nuriootpa Branch) in order to destroy apple and pear scab (*Fusicladium*), shothole fungus

(*Phyllosticta*) and curl-leaf (*Exoascus*) on apricots and peaches. The Central Bureau inspected Messrs Fowlers' fruit factory, Mr E. Salter's vineyard and cellar and the Yalumba winery. They also visited the orchards owned by a Mr Sibley and Mr J. Trescowthick. The general impression received by the Bureau was that the area was ideal for grapes and also fruit trees, provided the trees were sprayed against fungal diseases. A meeting was held in the evening at Angaston to discuss the agricultural potential of the district. The following day, the party proceeded to Evandale to inspect the fruit evaporators, installed by Mr H. A. Evans, where apricots were being dried. The fruit was subjected to sulphur fumes and the result declared to be of a very superior quality. The wine cellars of G. F. Cleland and Co. at Tanunda, and Messrs S. & W. Sage near Nuriootpa were viewed, as well as the orchards and gardens of Mr A. B. Robin and Mr C. B. Dorney.

The Mediterranean climate of South Australia encouraged settlers to grow grape vines. In 1889 the Stansbury Branch recommended planting Currant, Muscatel and Sultana vines, along with olives on stony ground and pines on sandhills. Members predicted the area would become a second Malaga (a Spanish province famous for its grapes). The same year the potential of the Murray River Flats as a grape vine and fruit tree area was recognised, particularly since easy transport for produce existed via the river. Unfortunately, each crop comes with its own threatening diseases, and vines are no different. Vines are affected by *Oidium tuckerii* (Downy Mildew) and anthracnose in particular. Sulphur seemed to be the answer to both problems, and a little copper added as well dealt with anthracnose effectively. Cut worms appeared in January 1894, but could be destroyed by placing, at the base of the vine, balls of a mixture of 30 lb bran, 1 lb Paris green (aceto-arsenite of copper), 3 lb brown sugar/treacle/molasses and water.

Since the very first meetings of the Central Bureau the committee had been concerned about the introduction of phylloxera to South Australia. Vines in New South Wales had been discovered with this disease. Since it was believed that the disease could be transported in the soil on vine roots, the Central Bureau decided to encourage the prohibition of imports from affected areas. A law had been passed in 1886 prohibiting imports of fruit trees and other plants from New South Wales, but the Central Bureau felt it was necessary to recommend further amendments in the Vine, Fruit and Vegetable Protection Act in 1891.

They felt some sort of compensation was due to owners of fruit trees that had to be destroyed because of disease, provided reasonable attempts had been made to control that disease. The Central Bureau also deemed it necessary for transportation of fruit trees and vines to be closely supervised; no vines or trees from diseased areas should be allowed into South Australia.

From the beginning of settlement in South Australia, wheat was a major product of farmers, so it was an important concern of members of the Agricultural Bureau. John Lewis, Chairman of the Burra Branch, presented a paper to his bureau on crop cultivation in June 1888. Most importantly, Lewis recommended combining cropping with grazing. This allowed farmers to rest the cropping land without loss of income by running sheep on it. He suggested cropping one third of the arable land each year, leaving another third fallow, and putting sheep on the rest. This "3-course" rotation would result in the same wheat yield as putting all the land under crop every year, but would require far less labour. He advised ploughing from 5-7" deep. The reaper and binder was considered superior to the stripper, since the grain could be harvested earlier and the straw was collected for use as horse fodder.



Hay Stooks at McLaren Vale

Wheat growers were beset with problems. In September 1888 the Stansbury Branch reported crops ruined by cockchafers; the remedies suggested were:

1. To roll the ground.
2. Spray with Paris green or London purple.
3. Harrow crops in order to bring the grubs to the surface in the hope that magpies and crows would eat them.

Then in November 1890 locusts appeared in droves and devoured the crops over vast areas of the colony. Branches as far apart as Stansbury, Lochiel, Burra, Renmark and Kanmantoo reported the devastation caused by this pest. It was necessary to find some way of destroying the insects. The Central Bureau suggested dragging harrows interlaced with bushes over the areas where eggs had been laid, then burning straw over them or spraying the grubs with a weak solution of arsenic. It was recognised that castor oil and larkspur plants were poisonous to them; planting them might help to keep the grown locusts away from the area. It is easy to imagine the heartbreak of farmers watching helplessly as the locust plague descended upon crops almost ready for harvest.

As if that wasn't enough, there was also the problem of rust in wheat crops. The search for rust-resistant wheats was a major concern of Bureau members. A great deal of experimentation and very useful work was carried out by two men in particular. Mr Inglis of Georgetown (Pine Forest Branch) and Mr Marshall of Templers (Wasleys Branch) contributed an enormous amount of practical help to the search.

Thomas Hardy, Henry Kelly and Albert Molineux inspected Richard Marshall's experimental plots on 3 December 1892. Marshall had over 180 different varieties of wheat growing on his property, Hope Farm. Of 2,200 acres, he had 500 under crop and ran a few sheep and cattle as well. "His system is to crop one year, leave it to Nature next year, then break up for fallow, turn sheep on to it, clean off weeds, and then crop again with some cereal." (*Garden & Field*, January 1893, p. 211.) One of his promising crops was Kings Jubilee which, although not rust-proof, escaped being attacked by rust by ripening very early, just as Leak's Rust-proof did.

In order to test the rust-resistant qualities of the various wheats, the plots are sown late in the season, side by side, in soil of even character, and as nearly at the same time as circumstances will permit. They are sown in drills, between the end of June and the end of July; wet days interfered with the more rapid sowing. About

100 varieties are now being experimented with for the first time, and the others are those which have been regarded in former seasons as being worthy of further trial. About 50 varieties are rust-resistant – that is, not likely, so far as has been ascertained, to be seriously injured by red rust; and of these 50 varieties there are 20 which are resistant in a high degree. But there are considerations other than rust-resistance that are required – such as liability to shake out the grain when ripe, quantity and quality of grain produced, stooling, strength and value of straw, etc., which make a wheat more or less valuable, and therefore a good number of these 20 will occupy a low place in the estimation of farmers when the typical variety has been discovered. The nearest to the ideal, in Mr Marshall's opinion, is one of his own "selection" named *Marshall's White*, which has a large head, good, soft, plump grain, strong upstanding straw, and prolific yield. So far no rust whatever has been discovered on this, whilst several varieties grown close beside have been very rusty. This was a single plant selected from a crop of Ward's Prolific (or Ward's Rust-proof, as it is sometimes called, though it is not rust-proof).

First, Mr Marshall named it *Ward's White*, but afterwards attached his own name to it. He has now had it four years, and last season sowed 14 acres with the produce (5 bushels 32 lb), and expects to get 10 bushels per acre. The appearance is deceptive, because the ears are filled with grain from the heel to the point, and there are four to five grains in each row.

Other most promising wheats are Nos. 2, 3, 8, and *Hercules*, a variety found amongst another crop by Mr Marshall's son, who shows a keen and intelligent interest in his father's work. Another rust-resisting wheat (though slightly subject to rust) is Leak's Rust-proof, of which there are 140 acres growing here, and likely to yield 10 bushels. Last year it went 19 bushels per acre. It has a large head, yields well, grain excellent, and does not shake out. Blount's Lambrigg, 180 acres, is yet a better kind, and will probably yield 12 bushels. (*Garden and Field*, January 1893, p. 211.)

Marshall's No. 2 became a very popular wheat in later years.

Then on 7 December, Henry Kelly and Samuel Goode accompanied Molineux to the Kadina area, where they inspected 200 varieties of wheat in order to accentuate various qualities. Mr Inglis compiled a record of his experiences during the 1892 season, which is presented in the March issue of the *Garden and Field* in 1893. He used

some of Marshall's varieties as well as his own. In his opinion, Marshall's *Hercules*, Marshall's No 4 and Leake's Rustproof were good varieties. Of his own wheats, he recommended Inglis Rustproof and crossed this with other well-known varieties to strengthen its qualities. Mr Oskar Zeigler also worked hard in this field. His paper at the Bureau's Third Congress in September 1891 is very interesting.

I do not believe any more in chemical or mineral preparations applied to the wheat before sowing, nor do I believe in spraying rusty wheat crops, though in both cases something may yet be discovered to check the disease, more or less; but I am getting more doubtful from year to year. If the farmers of Australasia wish to conquer the pest, quite a different plan must be adopted, and I have come here today to explain it to you.

Squatters and farmers have imported, and still are importing, first class horses, cattle, and sheep for the purpose of improving their livestock. Well, gentlemen, we must get our Agricultural Bureau to import samples of all rust-resisting wheats from all parts of the world, and so far as possible quickly ripening wheats ...

We want a wheat that ripens in 16 to 18 weeks like the Steinwedel, and is at the same time as rust-resisting as Ward's Prolific. And I maintain that with careful hybridization it is not only a possibility, nay, a perfect certainty, to produce such a wheat

... I now beg to ask you, after considering the frightful losses of three and a half million pounds during the last two seasons in South Australia only, whether it would be a step in the right direction if our paternal Government kindly provided the means for a small rust-experimenting farm. If we succeeded in raising a fast growing and rust-resisting wheat, we need not fear the red rust nor the ravages of the locusts any more, for the crops will be reaped before the latter pest appears. (*Garden and Field*, October 1891, p. 112.)

Some of the wheats which did prove to be fairly rust-resistant were also rather flinty, a characteristic over which much debate raged with respect to milling and baking qualities.

Now that most of the suitable agricultural lands had been taken up by settlers, it was no longer possible simply to clear new land to grow more wheat. It was necessary to discover ways of making the old country more productive per acre, especially since prices given for wheat were dropping. One of the useful discoveries of this

period was that less rust (and consequently higher yields) occurred in crops sown more thinly than farmers were accustomed to sow them. Unfortunately, this was still not enough to make wheat-growing a very profitable crop. Droughts in 1892 and 1893 combined with low prices to put many wheat-growers in a desperate position. In August 1893 a report from Mundoora Branch listed the following costs:

Ploughing	4s
Harrowing and Sowing	1s 2d
Seed (40lb)	2s
Reaping	2s 6d
Cleaning	5s
Short distance Cartage	5d
Rent at lowest rate (1s 6d)	3s
Rates (incl. water 4d)	10d
TOTAL: 14s 4d/acre	

Two years later this was adjusted by the Kanmantoo Branch. According to them, it cost £1 2s 3d to cultivate one acre. With an average yield of 6 bushels in that area it would earn 10s 6d (the current price was 1s 9d/bushel). At a deficit of 11s 9d per acre it was not worth the back-breaking labour required to sow and reap a crop in those days. At the same time, the Woodside Branch reported the following prices –

Wool 7d/lb Butter 10d Cheese 6d

none of which left the farmer with any profit. To make matters worse, yields continued to drop. Progressively worse crops are recorded in the Central Bureau minutes.

March 1894 Punyelroo	8.5-9 bushels/acre
1895 Kadina	6 bushels/acre
1895 Eudunda	4.5 bushels/acre
Arden Vale	4 bushels/acre
1896 Mundoora	3 bushels/acre

Although these figures are not from the same area, they clearly indicate a general decrease in average yields across South Australia. It was essential that more efficient means of production be found.

The Bureau made attempts to introduce fertilisers from its earliest days. Guano (bat dung) found in the Naracoorte caves was expected to produce the desired results. It was very expensive to cart any distance from the area, however, and since the samples were rather inconsistent, its use on any large scale was soon abandoned. Another well-advertised manure was Kainit from Germany, but that too had a limited success. The most important advance in wheatgrowing was the introduction of superphosphate.

Once the wheat had been reaped, there was the further problem of storing it free from weevils. This interesting method of dealing with them was recommended by Mr J. Page, the French Consular Agent:

get fresh sheepskins from the butcher and lay them wool downwards on the bags of wheat, etc. The insects would flock in to them. In the morning the skins should be taken away and spread in the sun, when the weevils would clear off. (*Garden and Field*, March 1889, p. 13.)

The less dramatic methods were perhaps more thorough. Members of the Bureau suggested destroying weevils by kiln-drying the wheat or fumigating it with burning charcoal, or by storing it between layers of lime. In December 1890 the answer was to burn sulphur and charcoal in a sealed warehouse.

The First Congress of members of the Central Bureau and branch members was held in March 1890 to coincide with the Royal Agricultural and Horticultural Society Show. Over four days they discussed every area of agriculture. It proved to be too much to absorb in the given time, so in September, fewer subjects were discussed in the same amount of time. The date was changed to September when more branch members were free to take time off from their farms. A resolution was passed at the second Congress requesting that the Government supply free passes for people travelling by railway to attend the Congress. This way more members of the Agricultural Bureau could afford to participate in the Congress, contributing their own knowledge and experience, learning from others, and taking new information back to their own districts. Unfortunately, the Railway Authority would only allow members half fares, not free passes.

The Third Congress was held on 17-19 September 1891, and this time 30 of the 53 existing branches were represented. The Agricultural Bureau was establishing itself as a well-respected organisation that was here to stay. The Chairman of the Central Bureau, Krichauff, addressed the assembled group and gave a very interesting description of the Bureau's work to date.

The exhibition of produce is a new interest added to our Congress. I hope to see it in future even more complete, and especially with regard to cereals and fruit. This may give us an opportunity to compare the advantages which some districts have over others for the growth of particular varieties of cereals, fruit, or vines, the time of their ripening in these, and enable persons to identify and classify varieties, which only too often go under wrong names, and lead

to so much confusion in the nomenclature ... our Journal becomes increasingly useful. Although reports have been frequently condensed, they were, I think, left in a sufficiently intelligible form. Besides the Journal, many hundreds of copies of the lectures by Mr Purser and by Mr West have been distributed, also copies of the Victorian Handbook of Viticulture, and other printed matter, which, doubtless, have been found useful. Some co-operative dairy factories and creameries have been established, after encouragement had been given by visits from the Secretary and members of the Bureau; but the condensation of milk does not yet seem to find favor with any of the Co-operative Companies. In connection herewith, I may mention that the Bureau has not lost sight of the necessity for making arrangements with Ocean Steamship Companies for cool chambers (not freezing) for dairy produce and fruit ... But unless we can arrange for definite monthly quantities, it is useless to approach the agents of any Steamship Company. The matter will be specially brought before you later on.

A trial has been made with Mr Dobbie's sprayer upon a rusty crop at Port Germein, with more than doubtful success; and on the appearance of young locusts, Professor Lowrie will attack them with the same implement ... Ensilage does not seem to have been made in such large quantities as is desirable. The cost need not prevent farmers, if they will follow the extract I read on November 5th, at the Central Bureau, or still simpler, the experience of H. W. Hughes, of Booyoolie, and others.

The question of licensing stallions has been remitted to the Branches, and the opinions expressed are of the greatest diversity. Those that are favorable to such licenses are by no means recommending the same licence fee. Some apparently wish to prohibit unlicensed stallions from travelling unless their owners pay a very small charge which would pay the veterinary surgeon; others demand a high fee. It is difficult to come to a decision, but, as the matter is certainly one of great importance, to prevent the increase of scrubbers and weedy screws, and to multiply useful horses for home use and exportation, I think something ought to be done. The Bureau might open a register of stallions. A stallion should be registered if a certificate from an authorised veterinary surgeon is shown, declaring that he is free from hereditary unsoundness, and that he shows such other qualities which make it likely that, with a sound mare, stock will be produced

making superior roadsters and strong but active harness horses. No doubt, if the charges for serving are reasonable, many of our small farmers, who make it a point to rear yearly a few foals, will inspect such register before deciding where they will bring their mares.

Once again I wish to call the attention of the South Australian farmers to the American sulky ploughs. You sit on a comfortable spring-seat driving the horses, and without any hard labor or difficulty you regulate the ploughing by means of levers close at hand, or lift the plough out of the ground. To be sure the work done does not look smooth and shining for a ploughing match. The soil is, on the contrary, in a somewhat broken condition, all the better for the harrowing. You can turn over a furrow of 15 inches, and do as much work and better, than the two-furrow plough, which has been neglected since by all who have tried the sulky plough. The horses have no additional weight to carry, although the driver sits on the plough, thus enabling old men or young boys to easily do the work. (*Garden and Field*, October 1891, pp. 93-94.)

A further discussion of ensilage, only touched on here, was provided by Mr James Bell of Morphettville in his paper *Silos and Ensilage*. He claimed

Cape oats, wild oats, or wheat are the best if you have not got suitable land for growing tares or maize. I think the latter is the best of all. Silage produces more milk and of a better quality than bran and chaff.

The next point is the system of filling the silo. I cut with the common mower, rake it up, cart in at once – the greener the better ... I have two or three men always tramping the silage as it is lifted into the pits with an elevator. When one pit is full, let it settle for a few days while the others are filling, and then fill up again; so go on until all are heaped up. Cover the top with boards 11 x 1 1/2 inch. The first year I weighted with cement casks filled with clay, but finding them too heavy to put on and off, I replaced them with square kerosene oil-tins filled with clay, which I find much more handy. These oil-tins can be got at the Government yards in abundance at about one penny each. I am inclined to think that screw pressure is better than anything else. It would be quicker to open up and more convenient should you want to fill the pits after they had settled for a week or two ... The milk produced by silage is richer in cream, butter is sweeter and of a better color, and the cost of feeding on silage is about one half as compared with bran and chaff. Bear in mind, I am not telling you what can be done with silage, but I am telling you what I have done and what the result has been. There is no getting away from the fact, dairying cannot be carried on in this dry climate without silage. (*Garden and Field*, October 1891, p. 107.)

There was a great deal of discussion at the Congress concerning the relative merits of the Stripper and the Binder for reaping wheat.

Mr H. Kelly – Mr J. L. Thompson, late of Dookie College, has arrived at the same results. Still they all knew what the stripper could do when



Members of Virginia Branch inspecting ensilage pits at Roseworthy Agricultural College. c 1905.



Making Ensilage

put into wheat just at the time it was ready. If it lies for a week or a fortnight, as some wheats have to, then a great loss often takes place. The crop is liable to storms, fires, and winds, but you should not forget that the binder gives you straw. A year or two ago Mr Wm Freebairn, of the Alma Plains, made trials, taking 200 acres with the stripper, and 200 acres with the mowing machine. The result was in favor of the mowing machine to the extent of four bushels to the acre. He got a clean sample. It is possible to have the steam thrasher and the mower and binder at work on the same farm, if they are used at the proper time, and straw when mown early is capitally sweet, and may be used for stock, and that would be of great benefit to every farmer this side of the Burra this year.

Mr Davey (Yorketown) – I made experiments last year. They were not so successful as I anticipated, as some sheep broke into one of the paddocks and destroyed some of the sheaves. In the other plots the binder yielded two bushels per acre more than the stripper. Last year was not a good year for the trial, especially on Yorke's Peninsula, where the weather was so cool. I waited for a blazing hot day to put the stringbinder into the wheat, and when I did put it in, the wheat was going down. The binder lost no wheat. I do not know that much wheat was lost by the stripper, but some

of the heads had gone down, and I lost through it. The wheat taken before the crop was fully ripe was a brighter and plumper sample than that from the fully-ripe crop. The straw was very good and sweet when cut green. The binder is most expensive. The two bushels would not cover the extra cost. It would take three pounds of twine to the acre. I cut a ten bushel crop, and at 10d that would be 2s 6d per acre for twine. To stook the sheaves two more men were necessary. Then there was the cost of threshing and winnowing. In a season like the present, though, it should be remembered that the straw had a certain value. The binder could be used in the first part of the season; and say a man has 200 or 300 acres, after he had taken off 100 acres the rest would be ready for the stripper. (*Garden and Field*, October 1891, p. 95.)

Since the binder could be used earlier than the stripper, when the wheat was not quite so dry as later in the season, it decreased chances of losing crops in hail, wind or fire during the later weeks of summer. A few years later, Mr Marshall reported the relative profits of using the binder and header or the stripper. In an average year, he estimated £5 4s 10d/acre for the former and only £3 6d/acre using the stripper.

However, at the Congress no conclusive decision was made about which was really the best machine. Both had advantages, and would be



A binder at work.

best used together, the stripper following the binder later in the season. Professor Lowrie, the Principal of Roseworthy College, gave an illuminating paper entitled *Theory and Practice of Manuring*, and Mr H. S. Denn of Kanmantoo provided an informative description of how a Farmers Cooperative Union might be organised.

On 1 February 1892, the Central Bureau acknowledged the recent appointment of a Minister for Agriculture, the Hon. William Copley. They hoped this would result in the Bureau receiving greater Government support in the future.

It was not always possible for Bureau members to attend the annual Congress held in Adelaide. For some, it was impossible to spare the time, others could not afford the travel costs. Repeated requests were made to the Railways to provide at least one free pass per branch specifically for this purpose. This way a representative from each branch could be present at the central gathering and report on the proceedings to his local group on returning home. But the Railways maintained that it was enough for them to allow all members travelling on Bureau business to purchase return tickets at single fare. However, they also charged carriage of any samples of produce members carried with them to exhibit at meetings or shows.

Unable to attend congresses, the Northern branches banded together and held their own

conference at the suggestion of the Appila-Yarrowie Branch. Mr C. G. F. Bauer, the Honourable Secretary of the Appila-Yarrowie Branch, organised the first of these at the Gladstone Institute on 15 March 1892. There were 28 members present altogether, representing his own branch, Yacka, Pt Germein, Pt Pirie, Petersburg, Clare, Narridy and Gladstone. The day began with a visit to Booyoollee Station where they inspected the silo pits, lucerne paddocks, stallions and brood mares. An exhibition of produce was mounted by Mr J. Brayley, including grapes, mangolds and other fodder plants.

In the afternoon Molineux addressed the conference and papers were read. Molineux concentrated on the necessity of planting vines and fruit trees in the area in order to provide a supplementary income to that earned from wheat. He also discussed the value of ensilage as feed for stock. Mr C. G. F. Bauer then gave a paper entitled *When is the Proper Time to Plant Trees?* He recommended planting a little late rather than too early, for a tree transplanted from the nursery before its natural growing season will not establish itself as well as those put out about 10 to 12 days before new growth appears. A paper sent by Mr Krichauff was read by the Secretary. In it he stressed the importance of a farmer's cottage garden. Mr Lawson read the paper on dairying which had been delivered at the Third Congress

in September of the previous year. This was followed by a lively discussion of related topics such as the value of co-operative butter factories and, again, the importance of making ensilage to ensure a good fodder supply for cows. The general tone of the conference was one of the practical improvements in farming; the message – diversification. Farmers simply could not rely on wheat as their only source of income. Seasons in South Australia were too unreliable; coupled with low prices, it was impossible to make a reasonable living out of wheatgrowing alone.

The disappointing closure of a branch occurred at Snowtown in June 1892. The current drought and pressure of work caused by it, allowed members little time for outside activities. Even something as important to farming as the Agricultural Bureau had to be sacrificed.

However, the Bureau was to receive a boost the following month with the arrival of Mr A. J. Perkins. He was introduced to the Central Bureau members on 18th July and attached to Roseworthy College as the Government Viticultural Instructor. His name had first been put to the Government as a suitable candidate for the position in December 1890. M. de Foex of Montpellier Agricultural College in France sent the following reference:

To-day I have, I think, in one of my former pupils, Mr Perkins, found the man you require. He is twenty years old, but of very strong constitution, which gives him the appearance of a much older man. He entered our College in 1887. He there proved himself an excellent student, and having gained his diploma left the College at the end of his last collegiate year. Well-educated, intelligent, energetic, and very earnest, he has a complete knowledge of viticulture, and is well able to give instruction, both theoretically and practically in all that relates to the culture, plantation, grafting, and sicknesses of the vine, as well as winemaking. Indeed, Mr Perkins seems to me to unite in himself the conditions you rightly look for, and I therefore do not hesitate to recommend him being persuaded that if you confide to him the duties you have described to me he will acquit himself to your entire satisfaction. (*Garden and Field*, February 1891, p. 134.)

Little did the Bureau realise just how influential this man was to become in establishing a thriving grape industry in South Australia.

The Gladstone Branch was very active in these early years, introducing many innovations into the Bureau. On 16 August 1892, a pruning lesson was organised at Booyoolie Station, home of Mr

H. W. Hughes. Thomas Hardy had also arranged a pruning competition on his property at McLaren Vale on 10 July 1892. Many local people took advantage of the opportunity to learn from his experience and enthusiasm, taking part in the competition to promote good production practices in the district.

The possible establishment of a frozen meat trade with England was discussed at this time, and the South-East looked like the obvious area to provide produce for the export market. In August 1892, "Mr Ellis, a South-East pastoralist, had stated that arrangements could be made for ships to call and carry the meat at 1 penny per pound". South Down breeds of sheep were known to sell best on the Liverpool and London markets, and the demand for frozen beef was also steadily increasing. While best English mutton realised 6d/lb and Scottish 6½d/lb, New Zealand meat was bought for only 4d/lb and Australian for 2¾d/lb. Although Australian mutton could not hope to bring prices as high as the locally grown meat, it still looked like a good proposition.

In 1892 members of Nuriootpa and Eudunda branches had met to discuss the spraying of trees. In August it was decided that the Bureau should buy a Knapsack spray pump for the use of the Angaston Experiment Committee which had been formed. This committee, consisting of Mr W. Trescowthick and Mr A. Salter, was to test four different sprays. The first was Bordeaux mixture (prepared by dissolving 10 lb copper sulphate in 1 gallon hot water, then slake 4 lb fresh lime in 1 gallon water, strain and add 20 gallons water, then add copper sulphate solution) on apples, pears, apricots, peaches and plums. Ammonia copper carbonate was to be tried on apples and pears. Sulphate of iron and sulphate of copper alone



Spraying fruit trees near Angaston, 1904.

were to be tested for their effectiveness against apricot scab, peach curl and plum rust. Bordeaux mixture became a favourite all-round spray at the cost of less than 2d per tree for each spraying.

The Nuriootpa Branch was dissolved on 24 October 1892. The Agricultural Bureau did not allow branches to exist closer than 15-20 miles apart unless there were significant differences in climate and condition. This was not the case in the Barossa Valley, but there were so many local farmers interested in the Bureau and keen to become active members, that they decided to form two branches. Angaston and Tanunda were far enough apart to qualify, thus allowing more people the opportunity of joining despite the limitation of 12 per branch.

The closure of the Snowtown Branch had caused a certain amount of consternation amongst the Central Bureau members, so in October 1892 they sent out a circular to all branches requesting suggestions on how to make the Bureau more popular. A flood of ideas came back, and the branches eagerly discussed ways of making the Bureau and farm life more attractive.

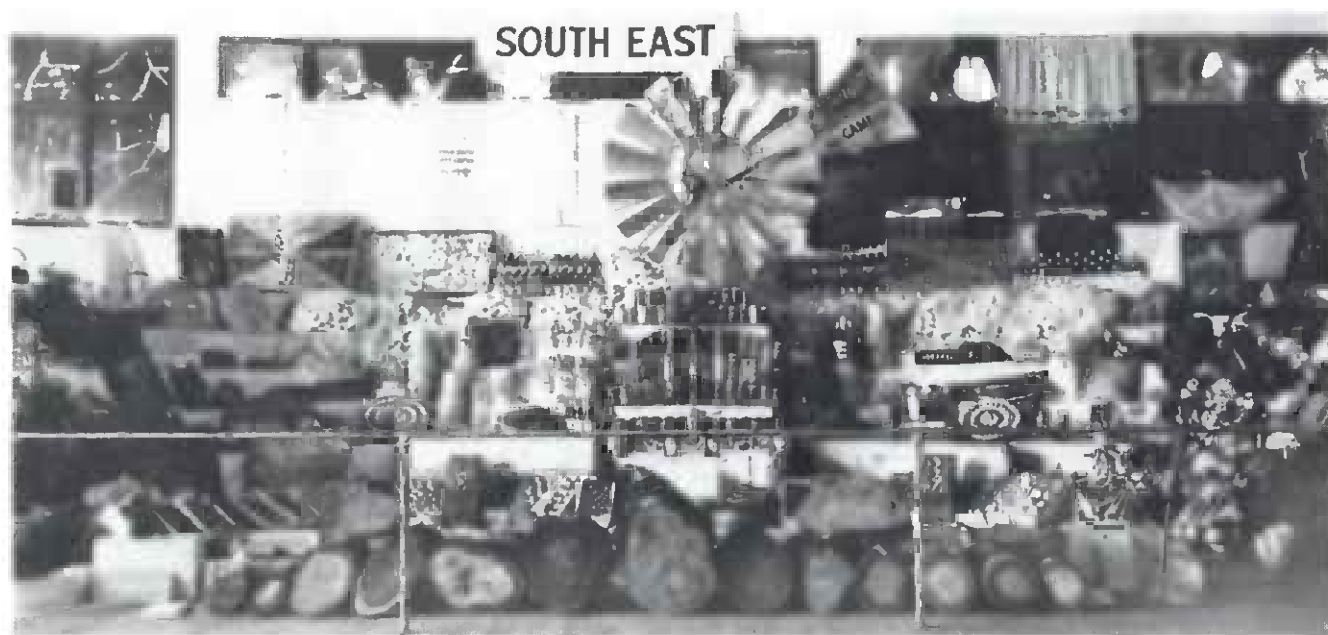
This excerpt from the minutes of the Kadina Branch includes some of the suggestions:

The Chairman thoroughly agreed that social gatherings would greatly tend to promote the aims of the Agricultural Bureau, and be the means of exchanging a deal of valuable information. By holding meetings occasionally at each other's homesteads, they would enlist the sympathetic interest of the young people and

of the older members of the community. The Pine Forest Branch already held meetings alternatively at each other's homes, and the system had given great satisfaction. If they looked around them, they would notice that the married farmers were more prosperous than those who were single. Lectures, arbor days, assisting each other by the American system of "bees", and cooperating generally would help the progressive movement that had been so well begun. These meetings at each other's residence would also stimulate experimental cultivation. He referred to the valuable experimental plot cultivated by Mr J. M. Inglis, of Pine Forest, where surprising results had been brought about in the production by hybridisation and selection of rust-resistant wheats. If each farmer cultivated only ten such experiments, a great deal of good would result. It was resolved to meet during next January at Mr Roach's farm. (*Garden and Field*, January 1893, p. 212.)

Branches began holding their meetings at members residences, inspecting each other's farms and giving papers on practical subjects at meetings.

The notion of social gatherings held in conjunction with the Bureau was enthusiastically received, and the beginning of 1893 saw a rash of such events. The Mundoora Branch was the first on 27 January with a show of "fresh and manufactured products of the farm, field and garden". (*Garden and Field*, February 1893, p. 271.) Women



Display of local produce.

and children were also invited to the show. Nantawarra followed on 15 February with a show of local produce, then Naracoorte on the 22nd.

The Mt Pleasant Branch also held an exhibition of local produce and manufacture with much discussion by the exhibitors and spectators alike on how best to grow, treat or manufacture the samples. Mr J. A. Naismith delivered a well-received paper on poultry keeping. All in all, it successfully realised the original aims of the social, and of the Bureau at large, namely,

to promote in every way the social, moral, intellectual, and material progress of the rural population of the colony; to establish upon the land a population contented, industrious, thrifty, and moderately prosperous; to make the rural life so attractive by means of a varied occupation, allied with a moderate amount of recreation, that the young people of the country will never be anxious to leave home for a city life, but rather that the city youth will be always anxious to get out into the country. (*JBA*, March 1893, p. 265.)

The Munderoor and Pt Broughton Branches combined for a social and show on 25 February. It was such an enjoyable day that members decided to hold another in conjunction with the Pine Forest Branch as well, this time on 23 September when the spring produce would be available for show. Later, it became the custom for branches of the Agricultural Bureau to stage massive exhibits of local produce at district shows. Artistically arranged to show off the finest produce from the area, these displays were greatly admired. Socials became a firmly established part of Bureau life in those early years when rural people were more isolated than today and had fewer opportunities to meet for pleasure as well as education.

The Central Bureau had encouraged the dairy industry in South Australia from its earliest days and had spoken frequently on the benefits of co-operative butter and cheese factories. It was also recommended that members of branches band together to invest in good breeding bulls to improve their dairy herds. The Petersburg (later to become Peterborough by an act of Parliament in 1917) Branch acted on this advice, purchasing *Bonnie Laddie*, an Ayrshire bull which was a definite advantage to the district. In its first two years it had serviced 66 cows resulting in 34 heifers and 28 bull calves. The Minlaton Branch had also bought a bull, a Jersey in their case, and by September 1893 negotiations were under way for the Cherry Gardens, Meadows and Tatiara Branches to do the same. The qualities desired in

good dairy cows were listed by Mr S. Potter in his paper read before the Lyndoch Branch.

The first point in a dairy cow is her capacity for storage of food for conversion into milk. The udder should extend well forward on the belly, and out behind the legs, and the nearer the udder behind comes to the root of the tail the better the cow for milk. The head should be light and clean; and the tail thin and long. (*Garden and Field*, October 1893, p. 143.)

Richman's Creek also purchased an Ayrshire bull, *Argyle*, which was to be used by Bureau members and would also be offered to a few outsiders at a fee of five shillings.

There was a great deal of discussion in the branches the following year about the branding of cattle. Under the current Brands Act it was obligatory to place identification in places which damaged hides in inconvenient parts. It would be more sensible if this could be altered and the brands placed in less conspicuous places, e.g. on the neck or low down on the shoulder or thigh. Such recommendations were made to the Stock and Brands Department, but it was some time before alteration could be made to the Act.

On 27 March 1893, the Central Bureau visited A. W. Sandford's refrigeration works in Grenfell Street where they were given a demonstration of butter making and an estimation of costs.

The party inspected the dry air refrigerating engine at work, and from the snow in the snow chamber were taken a bottle each of lager beer and English beer, frozen solid. Some of the members experienced the novel sensation of eating solid lumps of beer, which were obtained by breaking the bottles, and then chipping off chunks with the aid of pocket knives.

The cool chambers, of which there are five, are chiefly used for storing butter and perishable farm and dairy produce sent down previously to the auction sales on Tuesdays and Fridays. Some of them are used to cool the cream, which is sent by rail and otherwise from distances more than 300 miles from the city. Cream is sent by rail on the same tariff of charges as for milk, and the cans are returned free of charge. As the rates for cream are much lower than those for butter, this is an important concession from the Railway Commissioners, who find themselves justified, no doubt, for the lower charge in the fact that butter must be carried separately in special refrigerator cars, whilst cream can be carried in ordinary trucks. During transit the cream undergoes the process of ripening, and

the heat that would destroy the quality of the butter improves the cream. Upon receipt in Adelaide, the cream is at once placed in the refrigerator, and the temperature is reduced to 45 degrees F., when it is ready to be churned into butter.

The disadvantages of sending butter long distances by rail are numerous. Additionally [sic] to the expense of providing ice and special cars, it is well known that the first "bloom" of fresh butter will be lost between the period of leaving the dairy and its arrival, say 24 hours afterwards, in the city.

The party then proceeded downstairs into the cellar, which maintains an even temperature of between 58 deg. and 62 deg. F. Here Mr Rule, the dairy expert, showed practically how the butter is made. Some 25 gallons of cream had been reserved for the demonstration, and this was placed in a large square concussion churn. The temperature of the cream had been reduced to 50 deg. F., and the butter came within 20 minutes. Several stoppages were made during this time, in order to open the churn and let out the gas, which would be liable to burst the churn otherwise. About five seconds sufficed to open and close the churn. When the butter granules were about the size of radish seeds the buttermilk was drawn off, a bucketful of clean cold water was put into the churn, which was then turned gently four or five times, and the water was drawn off and replenished by more clear cold water. This operation was repeated three times, the last water being salted strongly. Next the butter was strained off and put aside for a time to "toughen". When the butter is toughened it is placed upon a butter-worker, flattened out, salt at the rate of half an ounce for each pound applied, and then the butter is made up into rolls, branded *Alpha* in the butter press, wrapped in grease-proof paper, and packed in boxes for the auction produce sale, being in the interval between making and sale placed in the refrigerator rooms until sold on account of the producers.

The whole cost – carting the cream, churning, making, papering, packing, and storing in the cool chamber – amounts to 1d per pound on the butter made. The cost of carriage of cream per rail is determined by the distance, and the usual commission is added for sale of the product. (*Garden and Field*, April 1893, p. 306.)

The Central Bureau had also been to visit Shaw's dairy at Woodville to inspect a new milking machine which was pronounced perfectly satisfactory.

Producing large quantities of milk was important in establishing the dairy industry, but that alone was not enough. There must be an efficient method of dealing with the produce, either by transporting it to a central factory as cream, or producing butter and cheese in local factories. The Mt Gambier Branch complained that the railway authority did not provide a refrigerated car for their butter; by the time it arrived in Adelaide during the summer months it was spoiled and certainly no good for export to England as anticipated. This was eventually resolved, and the butter was transported to Adelaide in one day by refrigerated car.

The Bureau continued to attract public attention. The Mt Gambier Branch held a public meeting and show on 10 May which several Central Bureau members attended. Particularly impressive was the display of 56 distinct varieties of apples.

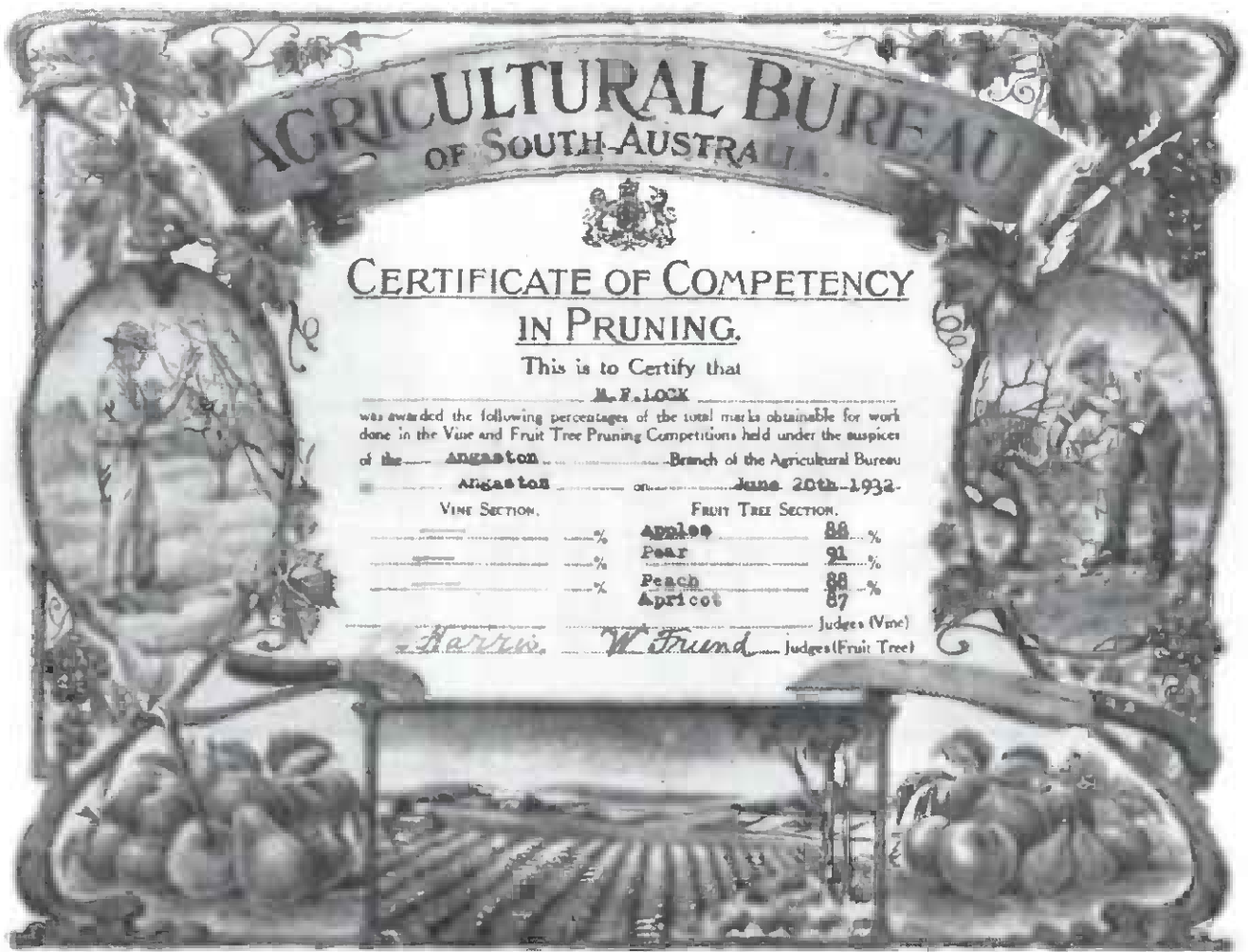
1893 saw branches everywhere talking of pruning competitions and demonstrations. The first of these occurred in the first week of July at Tanunda. The judges were Thomas Hardy from the Central Bureau, Mr Sobels and Mr Mazure. The first prize of £5 for best pruned vine was awarded to Mr J. C. Gelly. Second place was taken by Mr H. Basedow, followed by Mr J. C. Jacob. The next pruning match was held at Stansbury on 12 July. Held at Mr P. Anderson's orchard, it was organised in conjunction with the local Farmers' Club. About 250 people were present to observe the lesson on fruit tree pruning provided by Mr James Cornish. The judges of local pruning ability were Mr C. Pitt of Felixstow, Mr G. Quick of Marden, and Mr J. Western of Marion. Points were awarded for selection of wood and shape of vine (60), clean work (20), disposal of cuttings (10), and time (10). The winners of the men's competition were Mr H. C. Pitt with 84 points, then Mr D. C. Lamb with 78 points and Mr E. Lawrence with 73 points. A boys' section resulted in the following points being awarded:–

A. Latty	74	A. Eichhoff	66
A. Wurm	69	C. Anderson	57

A show of garden implements, spray pumps, etc, held on the same day attracted a great deal of attention. Of particular interest was the Planet Junior horse-hoe which was to become very popular.

The Watervale and Auburn Branches together organised another pruning competition on 24 July. Here the winners were:–

1st – Mr T. Brooks of Auldana



Pruning Competition Certificate.

2nd – Mr A. Bartlett of Watervale

3rd – Mr B. Bartlett of Watervale.

The first session of technical classes organised by the Gumeracha Branch closed on 13 July 1893. Thirty-seven students had been involved, learning mechanical drawing, arithmetic, bookkeeping, geology and chemistry bearing upon agriculture. The teachers for this first term were Mr T. W. Martin and Mr J. McInerney. The Agricultural Bureau clearly saw itself as an educational institution, catering to a wide range of interests, although it generally concentrated on more practical farming topics.

The Fertilisers Bill was passed in Parliament in 1893, largely due to the efforts of Krichauff. The Bill was intended to provide some sort of quality control of fertilizers on sale in South Australia. In the past, too many farmers had unknowingly bought substances which were adulterated with useless “filler” or “bulk”. Consequently, they spent large sums of hard-earned money with no improvement in their crop yields. By January 1897



Pruning competitions continue to attract interest in the 1980s. Pictured here is Mr Trevor Keil, a contestant in the Lone Pine-Tanunda Branch Pruning Competition, 1980.

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it became possible to have samples of fertilisers analysed by the School of Mines "Public Analyst", Mr G. G. Goyder. This service was offered at a fee of 3s per "definition", that is, for each compound or element tested, such as nitrogen or potash.

With the growth of the Agricultural Bureau, the Central Bureau decided it would be an advantage to increase its membership to 12 unofficial members in November 1893. It was also considered useful to include on the Central Bureau the Director of the Botanic Garden, the Professor of Agriculture, the Professor of Viticulture, the Chief Inspector of Stock and the Conservator of Forests by virtue of their position. To retain an active and lively participation of members of the Central Bureau, it was considered only fair that anyone who missed meetings for two consecutive months (four meetings altogether) must forfeit his seat on the Bureau.

By this time, codlin moth was causing a lot of trouble for fruit growers. Although remedies had improved since 1890 when the Port Elliot Branch recommended lighting smouldering or smoky fires under the trees to destroy the moths, there was still a real problem. In 1893 the standard procedure was to spray with a mixture of 1 lb Paris green in 200 gallons of water with 1 lb molasses/gallon. This was applied directly after the petals dropped from the flowers, and then once or twice more at two week intervals. This was moderately effective, but codlin moth was by no means eradicated through the use of this spray. This was

partly due to neglected trees on abandoned gardens. Even those who conscientiously sprayed their trees found the moth reintroduced in returned fruit boxes from other orchards. Another contributing factor was that the Paris green on sale from many outlets in South Australia was adulterated with other chemicals and therefore sold at a much cheaper rate than the pure compound. The weaker strength solution was simply not sufficient to deal with the pest. Mr George Quinn was appointed the Codlin Moth Inspector during 1894 and submitted the following report in August 1895 after one year in the position.

I have the honour to report for the information of the members of the Central Bureau my proceedings since June 28.

The inspection of the gardens and orchards in the southern suburbs has been carefully continued, though hampered considerably by the rainy season. Most of the plantations are small, and consequently the area inspected has not been great. The principal pests met with have been codlin moth (winter larvae), orange red or round scale, black peach aphid, and wood boring caterpillars. In Unley, Unley Park, Hyde Park, Millswood, and Goodwood Park, 218 gardens, containing about 1,816 apple, pear, and quince trees, have been found infested by codlin moth larvae. This list includes nearly all the trees of these sorts of a fruit bearing age in the localities. The usual printed precautions



Delegates at 1894 Congress.

Spraying fruit
trees at
'Craigburn',
Blackwood.



and explanations on treatment have been given. The orange red scale (*Aspidiotus aurantii*) is not present to an injurious extent, excepting in a few plantations. I have been recommending the use of resin wash of the following strength: - Resin, 10 lb; caustic soda, 4 lb; fish oil, 1 1/2 pints, or 2 lb of soft soap. The majority of the people who have used both say the caustic soda is more effectual than soda carbonate for this difficult scale, and I think the resin wash if properly made is not so liable as kerosene emulsion to injure the trees.

The black aphid of the peach has begun to make an active start, and this troublesome pest has been also found on apricots pretty frequently in the localities named, more particularly in the neighborhood of peach trees, generally clustering in little masses beneath the dark dormant buds, and the interesting sight of the insect ascending the trunks of the trees from the roots has been carefully noted. In some of the small gardens strong soapsuds from washtubs, and ashes from wood fires, have been used very successfully. These are cheap and simple remedies, and combined with an attack on those on the limbs with tobacco, resin, or kerosene washes before the leaves open, will no doubt prove most effectual, for by the time the foliage expands an immense quantity of sap will have been extracted, and the difficulties of treatment increased. Wood-boring caterpillars

find special opportunities for their depredations in the small gardens containing neglected trees of peach, plum, apricot, almond, and other stone fruits. If a good watch is kept, and a search made as soon as "sawdust" excreta is seen, the larvae is usually found beneath the bark, as the young larvae always seem to work amongst the soft cambium layers before burrowing into the tougher fibres of the trunk. When they have entered the solid wood, an injection of weak kerosene emulsion, or inserting a small bit of rag or cotton saturated in carbon bi-sulphide before plugging upon the holes, invariably proves successful; the outside wounds should be painted with Stockholm tar or limewash for protection until they heal. I am convinced that these borers are the chief cause of the early decay of many of our (stone fruit) bearing trees.

A visit of inspection has been made to 103 fruit shops and packing stores. Forty-three of them contained citrus fruits affected by red scale. [The owners were warned that they would be proceeded against in the future.] Every effort has been made to educate the police, who have been appointed inspectors, into the duties required from them. Photographs illustrating the codlin moth in various stages, with full written descriptions of color, size, etc., have been forwarded to them, accompanied by fuller information in pamphlet form, and suggestions for their guidance, so that I hope by next fruit

season to effectually [sic] check the practice of sending consignments of infested fruits into country towns for sale.

The suburban police are being also instructed by object lessons, photographs, etc., and after thoroughly inspecting a district, and serving notices on occupiers of infested gardens, a full list is handed over to the local police constable, with various instructions and suggestions, and some of the officers are attending carefully to the matter, as far as time permits.

I hope by this means to be in a position to devote more of my own time to the larger orchards in the future.

The local inspector at Mount Gambier (Trooper Foote) has sent in returns, showing the orchards infested by codlin moth, and what has been done by the owners for its eradication. This officer has shown great interest in the work, and is making arrangements for the people to get their trees effectually sprayed by a competent man when the time arrives. The other portions of the regulations are being carefully carried out under his supervision. (*Garden and Field*, September 1895, p. 89-90.)

Individual branches of the Agricultural Bureau continued to approach their involvement in the organisation with enthusiasm. The stump-jumping plough was tested on the property of

Messrs Lomman and Freeman at Arthurton on 21 February 1894. Two machines were put on trial before the local farmers, with the result that 49 were in favour of the plough entered by Mr C. Smith of Ardrossan, and eight preferred the plough from Harrold Bros of Adelaide. The Pt Lincoln Branch followed the initiative of other branches by holding a show on 7 March 1894. On the 25th of the same month, the Pt Broughton Branch held a trial of the stump-jumping skim plough on Mr Whittaker's farm.

Many other branches were to see this implement demonstrated in the next few months. In April the Dawson Branch reported, as part of their past year's work, that they had established an experimental plot in conjunction with a Recreation Ground with help from the District Council and the Athletic Club. They had also planted over 400 trees to celebrate the first Arbor Day on 1 August. In the same year, the Bute Branch reported that it had been responsible for the distribution of 1500 vines and 12,000 forest trees in the area. This clearly indicates how involved it was with the larger community, even though the Bureau had at times come in for criticism as being elitist due to its limited membership (in fact, this was to be increased to 15 in June).

Mr Hannemann of the Arden Vale Branch offered this useful advice to Bureau members in this report from the meeting of 16 April 1894.



Breaking up the ground with a three-furrow plough was a long and arduous job.

Harrowing is often a very unpleasant work in our Northern country, as we have to do such a lot of it before the rain comes; the dust is sometimes almost unbearable for the driver walking behind the harrows, and to remedy this, and to make the job a more pleasant one, I have adopted for the last few years the following plan, which I can strongly recommend; I harrow my land with two sets of harrows of four each, with seven horses abreast; six are drawing the harrows, and one in the middle has to carry the driver. In this way you cannot altogether escape the dust, but by riding in front you will not have to swallow one quarter as much as if behind, and you can also drive the horses better, being so close to them (having three on each side). By walking behind, it is often impossible, on account of the dust, to see the track. Besides the ordinary reins for the outside horses, I use a pair of reins for the saddle horse also, which are fastened to the stirrups, and can be pulled by the feet when required. People troubled with bad eyes will especially appreciate this style of harrowing. (*Garden and Field*, May 1894, p. 360.)

It provides us with a colourful insight into farming last century.

The Renmark area was rapidly establishing itself as a fine fruit growing district. The chairman of the Arden Vale Branch, Mr A. Hannemann visited the area early in 1894. He reported that apricots from Renmark had brought £100/ton in London, but land here cost £21/acre and in addition the farmers must pay water rates of £1/acre. He concluded that, impressive as the yields and profits might be, "Renmark is not the place for the poor man. A couple of hundred pounds is at least necessary to get a start there". (*JBA*, April 1894, p. 317.).

Observing the success of the Northern Branches Conference over the past two years, others decided to do the same. The Autumn of 1894 saw conferences arranged for the South-Eastern, the Far Northern, the Southern, North Yorke Peninsula and Southern Yorke Peninsula branches.

Approximately 50 people (including a few ladies) were present for the first conference at Mt Gambier on 7-8 March. Dr F. Ockley, Chairman of the Penola Branch, originally suggested they hold such a meeting in the area. Representatives from the branches at Tatiara, Penola, Mt Gambier, Millicent and Naracoorte attended, as well as Molineux, W. C. Grasby, Lowrie and Perkins from the Central Bureau.

A show of products, largely contributed by the Penola and Tatiara Branches, was held in connec-

tion with the Mt Gambier Agricultural and Horticultural Society. The conference was opened by Mr J. Umpherston, Chairman of the Mt Gambier Branch, then followed a paper from Krichauff read by Mr E. Lewis. It covered several topics relating to dairying, including the importance of breeds, good fodder to prevent tainted milk, and the use of aerators to remove any odours that do get into the milk. Lowrie followed with a long address on *Root Crops and their Cultivation*. He recommended mangolds as the most useful fodder for cows in their particular area. Since wheat prices had dropped 30-50% over recent years, but dairy products had maintained their value (and facilities for the individual farmer had improved) it seemed a very sensible move on the part of local farmers to plant root crops and keep dairy cattle rather than planting wheate crops. Grasby of the Central Bureau then spoke on *Insects and Insect Life*, and Perkins delivered a paper on viticulture.

The following day began with impromptu discussions on a variety of subjects – oidium in grapes, cattle diseases, fusidcladium in fruit and further talk on mangolds. The afternoon was taken up with visiting farms in the Yahl and OB Flat neighbourhoods. More papers were given at a meeting in the evening, including another one on root-growing in the South-East, this time by Mr H. Hart of Millicent. Dr F. Ockley followed with an address emphasising the importance of co-operation between farmers to advance their own interests. Pointing to the South Australian Co-operative Union, he described the value and effectiveness of such organisations. This was followed by a paper on *Marketing and Utilisation of Fruit* from Molineux and the conference ended with a slide show of insect pests presented by Grasby.

The Far Northern branches of Davenport, Woolundunga, Richman's Creek and Arden Vale combined for their first conference on 15 March. Kelly and Molineux joined 19 local Agricultural Bureau members at Quorn for the day. Molineux spoke to the assembled crowd on *Ensilage*, a favourite topic of his, then Kelly presented a paper on *Spaying Cattle*. He explained the advantages of performing this operation on milk cows, to extend their productivity after the last calf, with an improvement in both the quality and quantity of the milk. The afternoon session began with a paper from Mr N. Rogers of the Woolundunga Branch. In a discussion of *The Summer Treatment of the Vine in the North*, he warned against pruning at this time of year, reminding cultivators that, in their part of the world, vines need all their foliage to shade fruit from the burning sun and

hot winds. Mr E. H. Warren of the Arden Vale Branch spoke about *The Farmer of the Future*, concentrating on the need for improvements in farming practices to increase yields.

In conclusion, I would say that to combat the adverse circumstances that beset the producer, it is necessary to improve our methods and multiply the means of money-making. To this end it is imperative that we sharpen our faculties and increase our knowledge. I believe there is a great future before the Agricultural College of this colony, and that the time is not far distant, when the majority of farmers will consider it necessary to the after success of their sons that they be previously taught at that institution. Not theory only is taught, and if it were, all of us know that much of the common practice of today was considered the impracticable theory of a few years back. The farmer of the future must be a man of theoretical and scientific instruction, and then having the diligence to evolve by hard practice what it will pay to follow and what to discard. He must be an economist; in which case true economy will consist of wise expenditure. It is a false idea of economy to imperfectly plough the ground to save ploughshares, or allow the household chair to be minus legs to save a screw. And he should be self-reliant, depending on his own rightly-directed energy to forge ahead. (*Garden and Field*, May 1894, p. 371.)

This was followed by a conference of North Yorke Peninsula branches on 11 April at the Kadina Council Chambers. Molineux and Kelly attended this meeting as well, meeting with 24 delegates from Arthurton, Bute, Kadina, Paskeville, Pt. Broughton and Pine Forest. Mr A. France, jun., (as Chairman of the Kadina Branch) delivered the opening address, which was followed by a discussion of the Agricultural Bureau itself by Mr R. W. Bawden, Chairman of the Pt Broughton Branch.

As to viticulture, 1,250 acres of best claret vines have been established in Clare, Watervale, Auburn, and Riverton districts, 400 acres in Maitland district, also thousands of best varieties of vine and fruit-trees planted in various districts. All fruit trees in Angaston, Nuriootpa, and Tanunda were sprayed last year (beneficially) for eradication of fungus and insect pests. Then the breed of dairy cows has been improved, pure bred Ayrshire and Jersey bulls having been purchased by various Branches. Through the Bureau's teaching, ensilage is becoming general, and fodder crops are being grown properly and successfully. The Gumeracha Branch has ten acres fenced and planted, partly with fruit trees and seeds for experimental purposes. The Dawson Branch has ten acres for the same purpose. The Chairman of the Warrow Branch has enclosed and wire-netted five acres for experiments with Bureau seeds. Arbor Day has resulted in the



Women and children help with grape picking.

establishing of thousands of trees. Export of frozen meat is being pushed on by the Mount Gambier Branch and its members. And many other things that I could mention, but it would take me too long to do so. (*Garden and Field*, June 1894, p. 39.)

Then Mr J. Wearne of the Kadina Branch spoke on *The General Preparation of Seed for a Wheat Crop*. First, he insisted that good seed be used, not seed that had been shrivelled by red rust or any other disease, then the seed should be cleaned a second time to remove any cracked grain or other seed.

I commence sowing in the early part of April. If the land is dry I continue to sow unpickled seed until we have had enough rain to wet the land to a depth of about five inches. If we then have frequent rains to keep the ground moist I then pickle the seed in bluestone and water; then, should there be an absence of rain so that the dust rises from the harrows, I discontinue the pickling, and again sow unpickled seed until the land is again damp for working. My way of pickling is as follows: I have two large tubs (a large grease barrel cut in halves); fill these two tubs about two thirds with water; then having dissolved in a stone jar about five pounds of bluestone, I mix this with the water; then put a little more than half a bag of wheat in a bran-bag and put into one of the tubs; then put the same quantity into another bran-bag and dip as the first. Have a third bran-bag and put the same quantity into it. After the first has been soaking from ten to twelve minutes lift it out on the other tub to drain; then in with the third bag to soak. (*Garden and Field*, June 1894, p. 36.)

Mr A. Wight, Chairman of the Bute Branch, discussed the value of a Farmers' Co-operative Union, giving details of the Jamestown organisation which protected the interests of its members remarkably well. Through this union, farmers sold all their wheat and bought machinery, seed etc. at reduced prices. Mr E. J. Clark of the Kadina Branch repeated his paper which had been delivered at the Annual Congress previously, criticising the Bureau government. Then Mr Bennier of the Pt Broughton Branch described the success of vine-planting and the early ripening experienced in his district. Mr W. R. Whittaker of the Pt Broughton Branch gave a paper on the planting and cultivation of fruit trees. He particularly recommended apricot trees, as the dried fruit retained its flavour very well, and could therefore always be sold at a fair price. The conference closed with this contribution from Mr P. Allen of the Kadina Branch.

Toil on, and keep your peckers up,
Ye tillers of this thirsty land,
For you there dawns a glorious hope,
The Bureau has your case in hand.
Good times are coming we have heard,
Good times like those in days of yore,
When you'll receive your full reward,
Unless, maybe, you've gone before. (*Garden and Field*, June 1894, p. 40.)

The Southern branches held their first conference on 30 April at Strathalbyn. Again Kelly and Molineux attended, this time accompanied by Krichauff in tow. Thirty-seven delegates from Strathalbyn, Hartley, Kanmantoo, Woodside, Pt. Elliott, Cherry Gardens, Finnis and Milang were present. Interested representatives from Aldgate and Kondoparinga also attended.

The Central Bureau chairman, Mr Krichauff, gave the first paper, reporting on the frozen meat trade. He quoted prices for export, stating that 2d per pound would cover all costs. Mr C. H. Hussey, Chairman of the Pt Elliott Branch reread his paper on the sparrow pest which he had presented at the previous Congress, and this was followed by a discussion of the *Separation of Milk by Horse-power* delivered by Mr J. H. Yelland of the Milang Branch. This method was declared useful for dealing with small quantities of milk but a steam engine was preferable, since it could easily be regulated to run at the correct speed and maintain a steady pace. Mr H. S. Dunn from the Kanmantoo Branch then read a paper entitled *Hints to Farmers*. In the face of very low wheat prices, he recommended using wheat for pig feed, thus converting it into pork which was worth 10 times as much as wheat, pound for pound. It took approximately 5 lb of wheat to grow 1 lb of pork. This could then be sold on the English market where demand was high. Dairying was also considered to be a profitable concern in the light of demand for milk products on the English market. The last paper, *Ensilage*, was read by Mr J. Hutchens of the Woodside Branch. Finally, the Bureau members present resolved to hold an annual conference in March or April, a little earlier than their first conference, so that it could be held in conjunction with a show of produce.

A conference of Southern Yorke Peninsula branches followed on 27 July. It was held at Minlaton and included an exhibition of a few agricultural products as well as a visit to the Correll Bros' farm in the morning. Here the 28 delegates from Minlaton, Stansbury, Yorketown, Maitland and Warooka, along with about 150 visitors, watched a vine pruning demonstration

by Prof. Perkins and a fruit tree pruned by Mr G. E. Buttfield of Oaklands.

The afternoon session began with a few remarks from Krichauff, then Mr R. Higgins read a paper on horticulture prepared by Mr G. E. Buttfield. Some young trees were exhibited to illustrate various points brought forward in the discussion. The problem of sparrows was raised in a paper by Mr Henry Bawden, then Mr H. Kelly delivered a speech on dairying. This was followed by an address on vinegrowing by Perkins. Since there was little call for table grapes in the colony, he recommended planting varieties suitable for drying or pressing for wine. The evening meeting covered several topics, the first of which was take-all. Mr W. Correll discussed the causes and remedy for this fungus which destroyed wheat crops. Lowrie remarked in the ensuing debate that farmers should be able to avoid takeall by working the land after a good rain, fallowing early and generally avoiding working of dry land which would result in loose soil. Mr J. Davey set out the advantages of keeping sheep on small farms. They could graze on land resting from wheat crops, thus using what formerly went to waste and provide the additional advantage of keeping down weeds. Mr P. Anderson then recommended vine-planting by farmers. He reminded the assembled Bureau members that the cultivation of vines takes place at a comparatively quiet time of year, that is, between harvest and sowing of the following crops. An address on *General Farming for the District* was delivered by Lowrie, then a paper on beekeeping from Mr C. Smith, and finally Krichauff discussed the vine in relation to sandy soil.

The issue of *The Garden and Field* for July 1894 contained the journal with a new title. It had been changed to the *Journal of the Agricultural Bureau* and was now published under the auspices of the Department of Agriculture.

The Petersburg Branch was one of the most active and innovative in the first years of the Bureau. In 1894 it received the following praise from Molineux:

The annual report of the Petersburg Branch, of which Mr James Wilson, jun., is the Hon. Secretary, shows that the members have lost none of the zeal and enterprise that has always been displayed from the first. In addition to their bull *Bonnie Laddie* bought from the Hon. J. H. Angas for £30, the branch raised over £70. Over £41 of this was spent on seed wheat intended to test the value of change of seed. More than 1800 forest trees and 1000 vines had been procured and distributed amongst residents of the

district. They had also organised lectures and addresses at their meetings, with lively discussions following, and all meetings had been well attended by both members and visitors. (*Journal of the Agricultural Bureau*, hereafter referred to as JAB, August 1894, p. 143.)

The exchange of information encouraged by the Bureau resulted in a trip to Mildura in August 1894. Molineux and Perkins and approximately 12 branch members attended the Mildura Intercolonial Horticultural Congress held on the 7th and 8th. A Citrus Fair was held at the same time, exhibiting the superior quality produce from Mildura, Wentworth and Renmark. Tropical fruits from Queensland were also on display. In the 28 papers considered during the conference, the theme of union and co-operation between the various colonies of Australia was stressed. They urged uniformity in legislation with regard to pests affecting agronomical industries, and the establishment of an Australian Federated Fruit-growers' Union.

In September Mr H. Kelly of the Central Bureau visited the Far North of the State, including Arden Vale where he judged the best farms and orchards of the district along with Mr McColl of Richman's Creek and Mr A. F. Noll of Quorn. Framed certificates were awarded for Best Farm, Best Garden and Best Cultivated and Cleanest Farm. The results were:

Best Farm (350 points maximum) –	Mr C. F. Pearce 267, Mr B. Leibich 234 Mr G. Klingberg 220, Mr G. Liebich 200
Best Garden (200 points maximum) –	Mr M. Searle 155, Mr A. W. Fricker 135 Mr C. F. Pearce 80.
Best Cultivated and Cleanest Farm (150 points maximum) –	Mr M. Eckert 92, Mr C. Klingberg 75, Mr C. F. Pearce 52.

Around this time, much discussion had occurred in the Bureau with regard to the Standard Bushel of wheat. A lot of unclean wheat was being offered for sale and received the same price as clean samples. It was generally felt that a standard weight should be set with prices decreased or increased for samples below or above weight respectively. Thus, wheat growers would be encouraged to present their wheat for sale as clean as possible, ensuring a good reputation with overseas buyers. On 22 January 1895, the Corn Trade section of the Chamber of Commerce set the Standard Bushel at 62½lb. They arrived at this figure after inspecting average samples from



Harvesting at Roseworthy Agricultural College.

all areas of the State. The weight referred to the amount of wheat in the volume when all extraneous matter had been removed.

The work of the Bureau continued in the new year with as much force as before. The Woolundunga Branch held a show on 31 January with a very impressive display of local produce. Most notable, according to the branch report, were Gros Mignonne peaches exhibited by a Miss Uma of Spring Creek, Wilmington. Mr C. J. Zeisling was awarded the prize for best worked block. The show was followed by a concert in the evening.

Times were difficult, and wheat farmers were finding it particularly hard to meet their costs. The Bureau did what it could to alleviate the pressure. As a consequence of agitation by the Orroroo Branch, the railways agreed to a 15% reduction in carriage charges for wheat. Mr F. H. Snow of the Central Bureau offered quantities of Thomas phosphate for trial in the 1895 growing season. Thomas phosphate was in fact basic slag, the waste product of iron ores rich in phosphate. It looked like a promising fertiliser, but it turned out to be a very poor season and those who tried it felt it was impossible to come to any reliable conclusion.

Farmers had been forced to contend with the late frosts that occurred from time to time. October 1888 saw a very bad frost which caused a great deal of damage over a large area of the State. Again, in September 1891, reports of frost damage came in from branches as far north as Laura, spreading to Nuriootpa where temperatures of 27 degrees F. were recorded. The vast damage to the vines, fruit and crops prompted the Angaston and Nuriootpa Branches to form a committee of all members in 1895 in order to fight the frost with smoke fires on high risk nights.

Conferences proved to be enormously popular, and more were added to the annual calendar. The Northern branches expanded to include Far Northern branches as well. On 8 March 1895 representatives from Carrieton, Pt Germein, Woolundunga, Davenport, Hawker, Cradock, Quorn, Richman's Creek and Arden Vale met at Quorn with Kelly, Lowrie, Perkins and Grasby from the Central Bureau.

The conference was opened by the Chairman of the Quorn Branch, Mr Jno. Cook, then Henry Kelly read a paper on *Dairying and Creameries*.

He explained the modern system of dairying, the benefits arising from the invention of the

centrifugal cream separator, the improvements in churns and all dairying appliances, the discovery of the bacilli beneficially affecting the souring of maturation of cream, their isolation, and cultivation for the use of dairying after the sterilization of the milk and cream, thus destroying the ferments which injuriously affect the aroma, flavor, and general good quality of the manufactured product. (*Garden and Field*, September 1895, p. 99.)

In the ensuing debate, Mr R. W. Foster spoke of the good done by the butter export bonus, and advised farmers that England had an almost unlimited market for Australian butter. Mr W. J. Gleeson of the Carrieton Branch reiterated his statement about the selling of wheat made at the previous Congress, and his disappointment that it was still not graded and sold according to quality. Mr M. Searle of the Arden Vale Branch read a paper on vermin destruction followed by an address by Perkins on *How to fill up blanks in the Vineyard*. He showed three separate systems by means of layering, using blackboard sketches to illustrate the discussion.

The afternoon session commenced with a paper from Mr J. McColl, Secretary of Richman's Creek Branch, on experimental wheat growing. He pointed out the necessity for wheats that will grow in dry seasons, which the district frequently experienced, and early ripening varieties. Of the 14 varieties he had planted in the past season, he felt that Budd's Rust-resistant and Allora showed most promise and were worthy of further trial. Lowrie spoke on dairying, and then Mr N. Rogers of the Woolundunga Branch read his paper from the previous year on summer-pruning, concluding it was an unsuitable practice for their area. Mr C. Pearce of the Arden Vale Branch discussed water conservation, and the conference finished on the rather low note of *The Present Depression*, a paper read by Mr A. Dixon in the absence of Mr J. L. Watson of the Woolundunga Branch. The worst causes were listed as "over production, dependence on export markets, competition from producers much nearer our chief markets, the evils of the credit system, and obstructions between the producer and consumer." (*Garden and Field*, September 1895, p. 100.) It could almost have been written today.

A Mid-North conference was held at Petersburg on 27-28 March 1895. Krichauff, Molineux, Lowrie and Perkins met with 29 Bureau members from Cherry Gardens, Redhill, Narridy, Gladstone, Jamestown, Gumeracha, Dawson, Yacka, Appila-Yarrowie, Orroroo, Woodside and Petersburg, and

approximately 250 ladies and gentlemen. It included a trial of winnowers on the first day. May Bros entered a new machine, and Mr J. T. Pascoe worked on a two year old machine made by Bagshaw and Son. After observing both for half an hour, 13 of the local farmers offered their opinions, voting in favour of the Bagshaw winnower by eight to five. The competition was closer than this may seem: between them the judges awarded 1080 points and 1068 points respectively.

In the evening Krichauff read an abstract from a bulletin issued by the US Department of Agriculture concerning tuberculosis in cattle. It was recommended that any cattle discovered suffering from this disease should be separated from the other animals at once and the milk from such animals should not be used in any way. As Perkins was present, he addressed the meeting upon vinegrowing in the North, but had little hope for commercial vineyards in the area due to the limited rainfall. Then Mr H. Williamson read a paper on summer fodders. Ensilage was recommended, but he felt live crops were preferable for dairy cows whenever available.

The following day members inspected exhibits of local produce before settling down to hear several more papers. The Chairman of the Orroroo Branch, Mr Jas Jamieson, began by discussing the problem on every wheatgrower's mind that year, *How Shall We Live and Pay our Way?* With prices falling much faster than costs, this was becoming more and more of a problem, and the only answer lay in economising and developing new sources of income, such as butter, eggs and bacon. The ideas were elaborated by Molineux in a paper, *Wasted Substances and Neglected Opportunities*. Again, he advised that co-operation amongst farmers would ease their situation. By establishing the minor industries of the farm, the supplementary income would be useful and also make farm life more attractive for all concerned. A great deal of discussion followed, with many suggestions put forward by Bureau members. Mr J. Moody of Orroroo then read a paper on bacon curing. He believed the farmer was better off feeding wheat to pigs than accepting 1s 6d per bushel as was currently being offered. According to him, 5 lb of wheat resulted in 1 lb of pork, therefore a bushel would give 12 lb which at 3d per pound would bring 3s, clearly a much better deal. He went on to describe the best way to cure pork: rub into the meat a mixture of 12 lb salt, 6 lb dark sugar, 1/4 lb carbonate of potash or bicarbonate of soda, and 2 oz saltpetre. Do this every day for a week, turning every day, then every second day for another.

Mr W. Cornish of Gumeracha was called upon to describe his experience of take-all, which had first been observed on his farm about 39 years previously. He found the best course of action to prevent the effects of this disease (namely, crops dying off in patches), was early, wet fallowing and then working the land as little as possible. Early, dry sowing was likely to result in take-all destroying the crop. Lowrie proceeded with a discussion on breeds of dairy cattle, and Mr R. Caldwell of the Woodside Branch continued with a paper on the dairying industry. Although prices for dairy products had dropped a little in recent years, it was still a profitable business provided the farmer managed his herd efficiently. Mr Thos Dunsford of Narridy Branch then described the methods adopted by the English farmers, and the conference finished with a paper from Mr J. M. Cadzow of Orroroo on *How to Increase Forage*. He combined wheat growing with dairying, and found that by using a sheaf binder to reap part of his crops early, the straw was a very useful fodder.

Having carried on dairying for years in connection with wheat-growing, he thought that straw could be used as fodder in place of burning it on the fields. Twenty years ago he cut the straw with a mower, dragged it together with the horse-rake, and cocked it, but it was dirty and partly spoiled for general feeding purposes. When he stacked it he put a stable bucket of salt to each load of straw. Next year hay was scarce, and he chaffed most of the straw for his horses, and considered it equal to wild oaten hay chaff. The pressure of harvest work does not permit of getting straw together until it is next to useless for feeding purposes. The plan of breaking down the stubbles with harrows or dragging a rail over saturates the straw with soil, and stock will almost starve before they will touch it. When dairying took such an impetus he used the sheaf-binder on 20 acres a week before the crop was fit for the stripper. When it was dry enough he stacked, and afterwards thrashed it with the aid of an old stripper, belted to horseworks. This was very satisfactory. The grain was better than that left for the stripper, and the straw was something between hay and straw. Next year he sheaved 40 acres, left it in stooks till March, and although about seven inches of rain fell during harvest, the grain was superior to that which stood unreaped till dead ripe. It was not bleached, weighed 62 lbs. per bushel, and there was double the amount of screenings under the winnower to what was got after the stripper. This was a distinct gain, because these screenings could be crushed,

and fed to stock, instead of being scattered broadcast by the stripper, entailing no end of labor and expense in afterwards clearing the land whilst the straw made excellent chaff, not being in the least musty. The stooks were circular, 20 to 45 in number, the butts apart to allow air to circulate, and heads close together. These were practically safe from wind, hail, and fire. To thrash, he used an old Ramsay stripper, with patent beaters, shortened to take one sheaf through. His son stood behind, and caved the straw out with a pitch as fast as Mr Cadzow cut the bands and fed to beaters, and a younger son drove the horses. They could just put through one good wagon-load per day. They stacked the straw in the morning, thrashed the load, brought in another load for the following day, and winnowed when the whole thrashing was through. There were about four tons of straw to the load, which, at present low prices for hay, was worth £1 per ton. It should be chaffed for horses or cows, but can be fed whole to store stock. (*Garden and Field*, September 1895, p. 103.)

Field trials were really the only way to test the usefulness of machinery. The Robertstown Branch recognised this, and organised a trial of the Massey-Harris four-furrow plough on 10 May. It proved to be very beneficial for local farmers to see it in action, for they voted it the best plough they had seen for the clear, light soil of their district. A further field trial was held under the combined auspices of the Northern Yorke Peninsula branches at Mr A. Bussenschutt's farm at Paskeville on 11 December. Among the implements tested were the ordinary stripper, damp weather stripper, winnowers and stringbinder.

At the suggestion of the Pine Forest Branch, a preliminary meeting of the North Yorke Peninsula Agricultural Field Trial Society had been called on 21 November 1894. The fruits of this discussion were to be seen in Mr Norman's paddock near Bute on 31 July 1895 when the first Field Trial and Stallion Show was held. In a history of the North Yorke Peninsula Field Trial Society, Mr T Rodda records the first committee of organisers:

President	Mr R. W. Bawden
Vice-President	Messrs E. Ebsary and J. M. Inglis
Secretary	Mr H. S. Mackley
Treasurer	Mr A. Wight
Auditors	Messrs W. E. Millstead and T. E. Yelland

and the Chairmen of participating Branches.

Their efforts were rewarded by the presence of approximately 2,000 people Krichauff, Molineux

and Kelly from the Central Bureau were there, as well as members of the participating branches (Bute, Pt Broughton, Pine Forest, Paskeville, Arthurton and Nantawarra). To ensure it was an orderly affair and no gambling took place, police protection was provided. There were visitors from Kadina, Ardrossan, Redhill and the surrounding districts. Three-, four- and six-furrow ploughs were tested, the last mentioned being approved by all. The following entries were submitted for trial:-

3-furrow - Edwards, Hahndorf, Ballinger and Lawry, J. Martin & Co., W. H. Sharman.

4-furrow - C. H. Smith, W. Blake, H. Alchurch, W. H. May

5-furrow - B. G. Axford (smith plough)

6-furrow - C. H. Smith (awarded highest points = 89½)

W. S. Sluggett (smith plough), W. Blake, W. Jones, W. H. May, J. H. Rosewarne.

37 horses were entered in addition to the 16 ploughing teams.

A summer show was arranged in the first week of December. Trials of binders, strippers, winnowers, thrashers, headers, and side-delivery rakes were conducted. Then towards the end of 1899, the Commissioner of Crown Lands awarded the society its own permanent block of land - 119 acres near Paskeville, rented at the nominal rate of 3d/acre. The North Yorke Peninsula Field Trials are still a major event in the Agricultural Bureau calendar and attract a huge crowd each year.

The Agricultural Bureau was concerned with diversification in production and the improvement of current farming practices. Sometimes this was taken to great lengths, as in the suggestions put before the Minlaton Branch by Mr R. Higgins.

It was only by thoughtful breeding, selection, and management, that our domestic animals had been brought to such a state of perfection, and made necessary to our well-being. He need only instance the woolled sheep, dairy cows, draught and other horses. They have improved the breeds of various animals indigenous to other parts of the world and he saw no reason why we should not improve our own indigenous animals, especially the Kangaroo. He thought a great deal could be made out of kangaroo farming, by carefully selecting the stock, and breeding from the best strains. By proper management they would soon have a grand animal whose skin and flesh would be in great demand all over the world. He said flesh,

advisedly, as he firmly believed that the carefully bred kangaroo would compete with the best venison in any market and now that frozen meat could be successfully exported to England and elsewhere there should be a grand future for our "venison". There would, of course, be a prejudice against the meat to overcome, but if their first impressions of mutton and beef were derived from the flavor of ten year old rams or bulls, would they enthuse over their succulent merino chops or rump steak. The price of kangaroo skins runs up to 2s 10d per lb while best bullock skins vary from 3d to 3½d. Could they not by careful selection, surgical attention etc., almost double the weight of the skins and improve the quality at the same time? There are numerous islands and peninsulas in the colony admirably adapted for the establishment of kangaroo ranches. The inferior males could be castrated, only the best developed being used for stud purposes, and by careful attention to other details of management as is given to the breeding of cattle on well-managed cattle stations, the quality of the animals vastly improved both in flesh and hides. The kangaroo is very prolific, hardy, readily adapts himself to circumstances, and he could not see why a properly managed kangaroo ranch should not pay handsome dividends to the enterprising promoter. (*Garden and Field*, September 1895, pp. 98-99.)

Molineux had recommended the use of Question Boxes in the branches to ensure lively discussion at meetings. The Mylor Branch was the first to implement this idea, and used it for their 2 November 1895 meeting.

A brief resume of the questions and answers was reported to the Central Bureau:

Q. What is best to grow for hay in this district?
A. Oats and wheat.

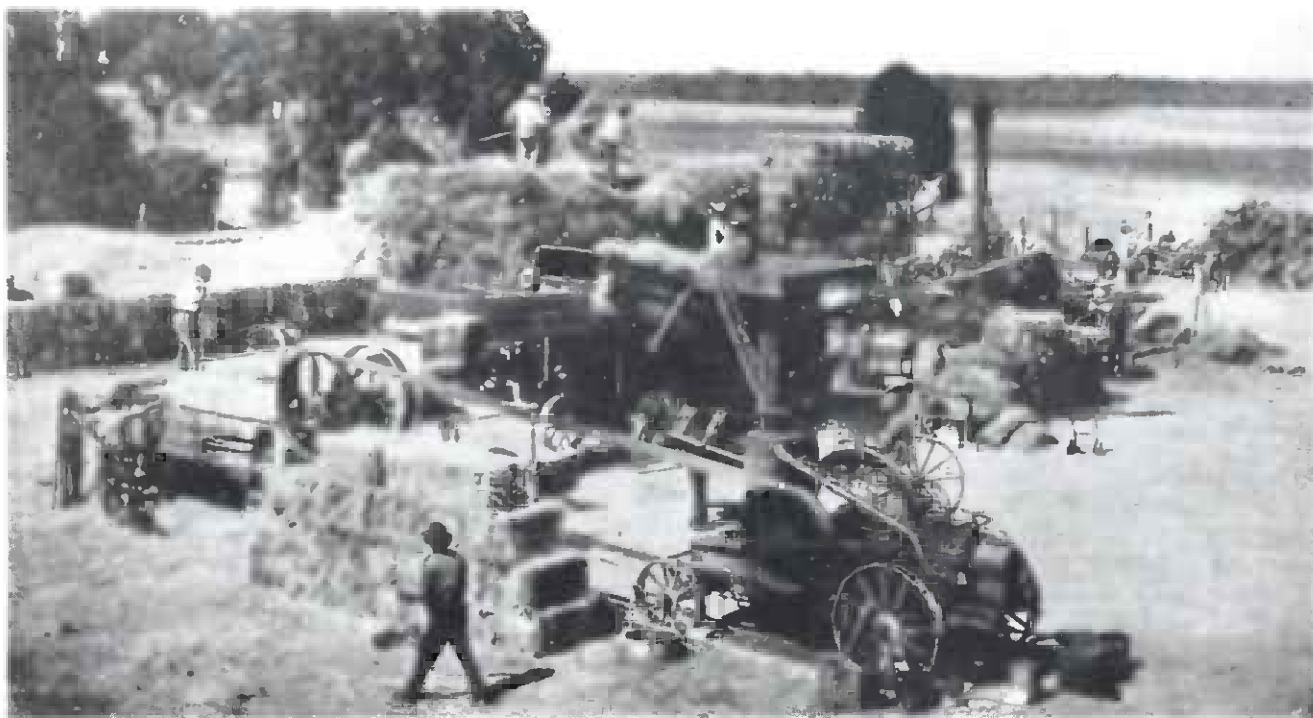
Q. At what time should it be sown?
A. With the first rains.

Q. What varieties should be sown?
A. Algerian oats and Purple Straw wheat.

Q. What is best for green feed and fit to cut earliest?

A. Barley and Oats. (*Garden and Field*, January 1896, p 207.)

Many branches approved of this method for introducing topics for discussion, placing the boxes in public places for both their own use and for interested members of the public wishing to gain particular information when attending meetings.



Sheaves fed into thresher at rear, and straw baled in the foreground, using steam power. Roseworthy Agricultural College, c 1905.

Moves were afoot to establish a Fruitgrowers' Association at Angaston at this time. In August 1893 Molineux had visited the branch to discuss how they might set up a co-operative. The organisers envisioned something along the lines of the South Australian Farmers' Co-operative Union which had grown from its origins at Jamestown to a statewide concern. A committee was appointed to look further into the matter, with the suggestion that they might form a branch of the South Australian Gardener's Society. However, it was not until December 1895 that an Association was finally formed to protect the interests of growers and to market the fruit from the Barossa Valley. It embodied the spirit of co-operation for mutual benefit encouraged by the Agricultural Bureau, a quality to be found throughout the branches of the Bureau.

The Minlaton Branch organised a farm competition on 14 March 1896. The judges, Mr Kelly and Mr Goode of the Central Bureau inspected farms within a 15 miles radius of the town. They considered

1. The general condition of the land, whether it had been properly tilled, considering if it was allowed to stand as bare fallow or used for summer fodder.
2. The best kept and laid out garden, including orchard, vineyard and vegetable patch, with

regard for natural conditions since not all farms have suitable land for such areas.

3. The general condition of water supply both for domestic use and for stock, natural advantages taken into consideration.
4. The general condition of all stock, machinery and fences.
5. The laying out of paddocks, and convenience for working from the homestead.
6. The general condition of homes, outbuildings, stabling and yards.

Finally they awarded certificates to Mr T. King of *Sandalwood*, Brentwood, Mr H. Evans of *Upland*, Curramulka, and Mr A. McKenzie of *Spring Farm*, Minlaton.

Another conference was added to the list on 19 March 1896. Held at Tanunda, it was attended by delegates from Angaston, Gawler River, Riverton and Tanunda, plus several visitors, resulting in a total gathering of 50 to 60 people. Lowrie, Sandford and Molineux of the Central Bureau were present.

After some introductory remarks from Mr J. H. Walden, Chairman of the Tanunda Branch, Mr R. Player (Chairman of the Angaston Branch) read a paper on sheep-breeding. He stressed the importance of keeping only good sheep, no matter how small the flock, and recommended the Merino as the best all-round breed. This was followed by a

paper on dairying by Mr J. Badman of Gawler river, then Mr E. S. Matthews of the Angaston Branch read a long paper criticising the judging carried out at agricultural shows. This was refuted by Molineux, who claimed the judges deliberated at great length before coming to fair decisions. The general feeling was that agricultural shows would be more useful if fewer were held; the profusion of small country shows was really of no advantage to anyone, and a great deal more could be achieved in the way of competition and exhibition if only a few larger shows were held each year. Lowrie provided a practical paper on the subject of hay growing. This was followed by a discussion of soil moisture by Mr A. M. Dawkins of Gawler River and a paper sent by Perkins on the question of Mataro grape vines. Grapegrowers had been advised to graft their Mataro vines to Cabernet, but Perkins felt the answer lay in more, smaller wineries. South Australia could not hope to compete with European wines on the international market until there were almost as many vinegrowers as winemakers. Then each grower would understand all of the peculiarities of his produce and use them to best advantage in winemaking. The day ended with report on the Codlin Moth in Tasmania by the Rev. H. T. Hull.

The following day visitors were driven around to various places of interest in the district, including the Chateau Tanunda with its storage accommodation for over one million gallons of wine, and Seppeltsfield. Here the group inspected the labour-saving devices installed, many of which had been invented by Mr Benno Seppelt himself.

Over 40 people attended a conference of Hills branches on 8 December 1896. They came from Cherry Gardens, (the host branch), Clarendon, Upper Sturt, Meadows and Mylor to discuss topics of mutual interest with Molineux and George Quinn, the codlin moth inspector.

The first paper, by Mr A. L. Morphett of the Clarendon Branch, discussed fruit cultivation in the Hills. He believed apples were ideal for this area, requiring no irrigation and fetching 13s to 17s 6d/case on the London Market. Freight and packing costs amounted to approximately 7s/case at that time, and were expected to decrease by about 6d in the near future. Even on the local market apples were sold at 10s/case. The most popular varieties were Rome Beauty and Cleopatra; Mr Morphett had reservations about the Jonathan apple, considering it best tried on a small scale first. However, it did look like a promising variety since Jonathans from the Adelaide Hills could be sent to London before the

Tasmanian apples were ready to be picked. As we now know, Jonathans have become one of the most popular varieties in South Australia.

The Hon Sec. of the Cherry Gardens Branch, Mr C. Ricks, then read a paper on *Waste of Wealth, and How to Prevent it by means of Cooperation*. He claimed that local producers could supply far more in the way of dried and preserved fruits, hams, bacon etc. than they were at present for the home market. Looking at the import figures for South Australia, he found that approximately £121,000 were paid by consumers for food that could easily be grown in the colony. A co-operative society could ensure that local farmers received fair prices for their produce, at the same time reducing the cost for consumers. A further saving would be possible if the co-operative society bought fertilizers, implements etc, wholesale and distributed them cheaply among members.

The next paper, *Best Breed of Cattle for Dairy Purposes*, was delivered by Mr E. Giles of the Clarendon Branch. He agreed with the Agricultural Bureau policy of introducing good bulls to improve the herd, and reminded his audience of the importance of good feed to ensure good production. The day ended with a discussion of commercial manures by Mr W. Nicholls of the Mylor Branch.

It was around this time that farmers began using bluestone to pickle wheat. They found that grain treated in this way usually produced crops free of bunt, one of the main diseases decreasing yield. As poor seasons added up, any methods of improvement were sought. To ensure the fertilizers used were available to benefit the seed, farmers gradually began drilling small amounts in with the seed. This technique gained acceptance, and is standard practice today. The Pine Forest Branch reported average wheat yields of 21½ bushels/acre in the Bews area for the 1895/96 harvest. The Pt Broughton/Pine Forest Spring Produce Show was abandoned because there was little to show for the season's work. Farmers had to do all they could to increase yields in the face of the capricious elements. A useful tip was offered to the Yorketown Branch by Mr J. Koth in March 1896. He informed his contemporaries of a method of protecting fence posts from white ants with salt.

He had made a study of the habits of white ants (termites), and had found that they never attacked posts set up in salt swamps. He, therefore, adopted the practice of putting a shovelful of salt in each hole when filled to within six inches of the surface, and then filling

Horses were of major importance to the farmer before motor power became available.



up with soil. When rain falls it dissolves the salt, which impregnates the soil around the posts, and the termites, or white ants, refrain from attacking posts so treated. Telegraph posts and all timber could be protected in a similar manner. He strongly recommended farmers who had salt lakes on their holdings to soak their posts in the lake for twelve months before using them, when the extra salting in the post holes would not be necessary. He had been informed that the posts for a stockyard, made of red gum have been dressed with tar, but the white ants soon attacked them. He then painted the posts with strong brine, which had the effect of driving the insects away. (*Garden and Field*, April 1896, p. 273.)

The *Journal of the Agricultural Bureau* was used more and more by Bureau members as a means of communicating with other branches. A seed exchange column was suggested, and in 1896 branches sent in their remedies for common stock diseases.

Particular care had to be taken of horses – the farmer relied on them to put in crops, the pastoralist for transport to round up his stock. Mr J. H. Dunn read a paper to the Johnsbury Branch on the proper care of horses. Since the shoulders are under great strain in working horses, he proposed the following preventative measures and cure:

To prevent sore sholders – Have a well fitting collar, keep both shoulders and collar clean, and, above all, feed the horse according to the work he has to do. By feeding properly, the waste of tissue caused by work will be repaired, and the sore shoulders will rarely occur. Some

horses, especially if free, are liable to scald on the shoulder upon being put to work after a spell. To prevent this, it is a good plan to either smear the face of the collar or shoulders with common soap previously soaked in water for several hours. This will work into the leather, and so lubricate the shoulders that they will not be injured by the friction of the collar. (Of course, it must be cleaned off the next day.

To cure sore shoulders – Should a blister be noticed, at once clip off all hair surrounding it, adjust the draught if possible so as to remove pressure from that particular spot. It is a good plan to cut a slit in a bran bag large enough to pass over the horses head, and to fit the neck nicely, so as to be between the shoulders and collar. Should a bad wound, nevertheless, occur, cut a hole in the collar, and fill with horsehair, as previously recommended. Should sore shoulders occur through boils, ten drops of tincture of arsenic is a good thing, but the main cure, as well as prevention, is to drive carefully, as well and regularly. A horse should not be driven more than four or five hours without food. (*Garden and Field*, November 1896, p. 150.)

The following remedies were put before the Petersburg Branch by Mr R. McPherson and printed in the *Journal*:

Windy Colic or Gripes, stoppage of the bowels.
– Spirits of ammonia, 1½ oz; laudanum, 2 oz; ginger, 1½ oz; 1 quart hot ale; hot water applied to the abdomen, and if any injecting syringe is at hand (which every farmer should possess) large quantities of water at a temperature of 100

degrees should be injected and will in most cases give relief.

Ointment for wounds, etc. – Beeswax, 4oz; lard, 8oz; resin, 4oz; honey, 2oz; mix and boil slowly; while boiling add 1 pint spirits of turpentine; stir until cool. Splendid ointment for sore shoulders, sore backs, cuts or bruises. (*Garden and Field*, November 1896, p. 149.)

Members of the Dawson Branch suggested:

Inflammation of the Bladder or Kidneys. – By Mr Dowden – Give laudanum, 1 oz, raw linseed oil 1 pint. Foment the loins with hot cloths, using a little turps in the hot water to prevent cold or chills. Cover with warm rugs or a fresh sheepskin ...

Sprains. – By Mr Renton – Mix and rub in well, twice a day, pulverised bay salt, 8oz, crude sal ammoniac, 2 oz, sugar of lead, 1/4oz, vinegar, 1 1/2 pints.

Mange or Itch. – Take common sulphur, 6 oz; train oil, 1 pint; spirits of turpentine, 3 oz. Mix well, and rub in with flannel or a painter's brush. (*Garden and Field*, December 1896, p. 179.)

A salt lick commonly used in the South-East was made of a mixture of 10 lb pulverised sulphate of iron in 100 lb of common salt.

The Millicent Branch held its first "Grange" meeting in November 1896. It was to act as an auxiliary of the Agricultural Bureau, encouraging women to make rural home life more interesting and comfortable. They swapped recipes for bush soap, toilet soap, candles, starch, jams, crystallised and bottled fruits, dried fruit and vegetable, etc. It was a useful source of information about how to deal with the new vegetables and fruit introduced by the Agricultural Bureau through experimental seeds.

The 1896-97 season was a severe drought. A Distressed Farmers' Relief Fund was set up, and those Bureau members who could contributed generously. Reports describing conditions came in from all over South Australia. Horses were dying of starvation, and stockowners in the Woolundunga area cut down tress to feed their animals. Farmers needed more hardy fodders to stand up to these sorts of seasons. Saltbush looked as if it might be the answer and Molineux advised the Balaklava Branch that "seed of saltbush, if carefully covered in the autumn, will generally germinate readily, though best results are obtained by sowing in prepared beds, and transplanting in the spring". (*JAB*, July 1897, p. 389.) Now more than ever before, the Agricultural Bureau was needed as a means of

disseminating information to help farmers make a living in this harsh land.

It was a bad year for fruitgrowers in the South-East, as well. The codlin moth infestation of this area had reached mammoth proportions. So badly were apples affected, that farmers fed them to cows since there was no market for them. Orange round scale was causing trouble, too, and Mr Quinn suggested a resin wash for infested trees. This is made from 10 oz common resin, 10 lb soda crystals and 5 lb soft soap boiled together and diluted to make 50 gallons of the mixture.

Despite these problems, the export market for fruit was growing as Australian produce gained a reputation in Britain. Mr E. Burney Young, Manager of the London Produce Depot reported that 10,000 cases of South Australian apples, pears, grapes, and quinces had been sold in London during the season. Of the apples, Cleopatras had proved to be the most popular, realising 20s, whereas Jonathans had brought only 12s since they were such bad travellers.

In order to deal with their difficulties, Agricultural Bureau members searched for new technology and knowledge to improve farming practices. They believed one of the answers lay in the new seed and fertiliser combined drills. By drilling in seed together with fertiliser, they hoped to increase yields. They favoured this method over broadcasting because:

1. The seed is put in at an even depth and at regular intervals;
2. If manure is used it goes in with the seed, and is ready to nourish the seedling at once;
3. The drill acts as a cultivator;
4. There is a large saving in the quantity of seed, and much less seed is malted, owing to its being better covered. (*Garden and Field*, June 1897, p. iii.)

Trials were held all over the state to determine whether the outlay involved in buying new machinery was worthwhile. On 7 April the Crystal Brook Branch held a trial on the farm of their Chairman, Mr W. J. Venning. An enthusiastic response was evoked, followed by much discussion among local farmers. Then in May the Petersburg and Mt Pleasant Branches tested the Farmers' Favourite drill. Mr J. King of Gladstone claimed that he could sow 15-18 acres per day with the new drill, which was a little slower than broadcasting. The quantities of fertiliser (usually Thomas phosphate) recommended varied (at this time Thomas phosphate cost approximately £4 9s/ton compared to bonedust at £4 14s/ton



The combined drill used to put fertiliser in with seed.

and 6s 6d/ton for Kangaroo Island guano) from $\frac{3}{4}$ to 2 cwt per acre. The Murray Bridge Branch also held a trial, this one on the farm of Mr J. G. Nicolai; again the onlookers were pleased with the results, surprised at how well the Farmers' Favourite managed the rough ground. (Trials were also held at Kapunda, Tatiara, Mt Gambier, Yankalilla and then at Bute on 11 August under the auspices of the North Yorke Peninsula Field Trial Society.)

Due to the increasing scope of the Department of Agriculture, the *Journal of the Agricultural Bureau* was replaced by a larger publication, no longer a supplement to *The Garden and Field*. The new magazine was called *The Journal of Agriculture and Industry* and was to be the official organ of the Department. Free copies would still be sent to all Bureau members, and others could acquire copies at a cost of 5s per annum. The first edition came out in August 1897. It still contained reports of Bureau meetings, and also included general seasonal notes contributed by department experts, and illustrations to help farmers identify noxious weeds.

As is often the case in farming, one's misfortune is another's salvation. The 1897 wheat crops failed in the Northern Hemisphere, causing world prices to increase. Although South Australia had another

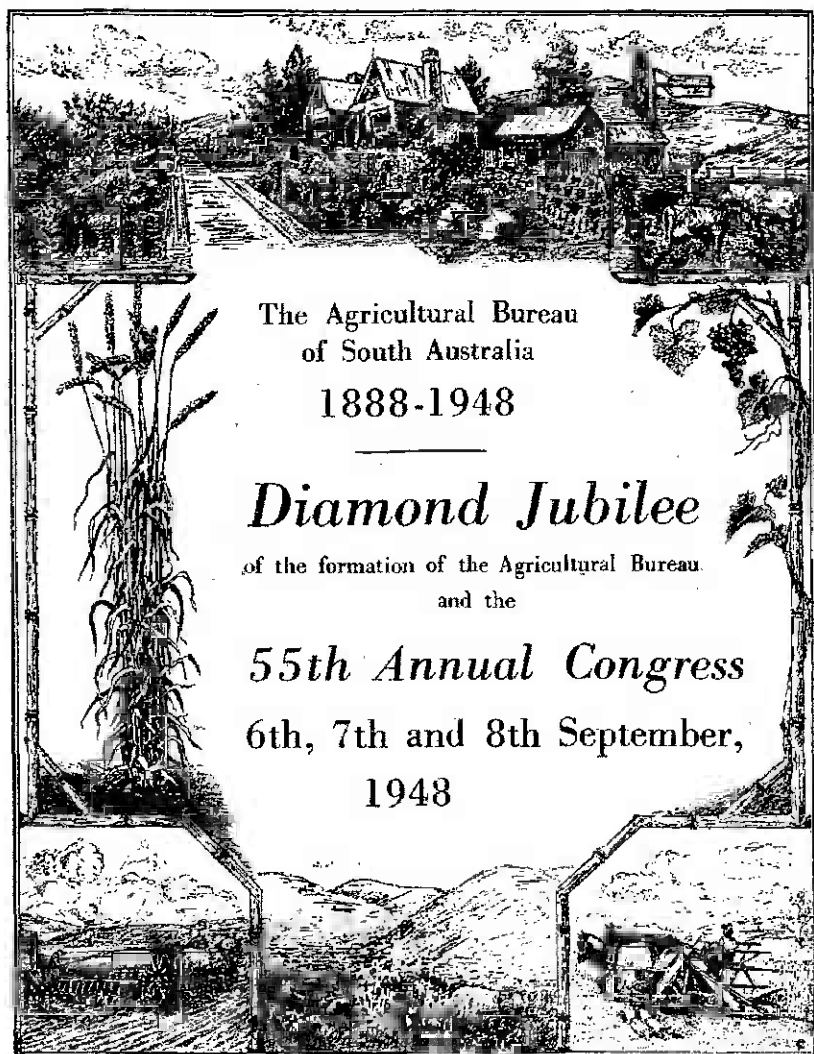
dry year, the wheat available for export fetched high prices, 5s 2d – 5s 4 $\frac{1}{2}$ d per bushel at Pt Adelaide. Best rollerflour sold for £12 15s – £13 5s. (*Journal of Agriculture and Industry*, September 1897, p. 142, hereafter referred to as *JAI*.) The previous year farmers were lucky to get 4s 6d per bushel for wheat at Port Adelaide.

In comparison, the following figures for keeping 10 cows and 1 bull were provided by Mr A. Bairstow, Chairman of the Narridy Branch. As a conservative estimate, he suggested that each cow, in milk for nine months of the year, would bring 3s/week or a total of £54/annum for the herd. From this, £6 5s must be extracted for rent on 100 acres and £37 15s wages "for a girl and other expenses". This left a profit of about £10/annum.

As the tenth anniversary of the Agricultural Bureau of South Australia drew near, Molineux could look back at his work with pride. In its first decade the Bureau had become firmly established as an important link between the agricultural experts and the men on the land. Many innovations of scientists had been introduced to farmers through this organisation. All fields of agriculture and horticulture had advanced during this period; none more so than wheat growing, which remains one of South Australia's most important industries. New methods of seeding and harvesting had

been introduced, and superphosphate was being used in large amounts. Farmers had been persuaded to diversify, and many more now ran a few sheep, kept dairy cows and laying hens, and grew vegetables and fruit for their own consumption. Gradually these sidelines were developed to provide a supplementary income as farmers

realised they could not rely on wheat for their sole income. Branches of the Agricultural Bureau organised field days and conferences to include other local farmers in their program and encourage them to adopt more efficient farming methods to increase production.



The cover of the first Journal of Agriculture and Industry, designed in 1897 by Mr Fred Coleman of the Saddleworth Branch (and member of the Advisory Board of Agriculture), was used again for the 1948 Congress Programme.