

Moveable Heritage Thematic Study:  
Wheat industry Rural Technology

A Short History of the Riverina Wheat Industry

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## INTRODUCTION

To appreciate the development of the country inland from the sea and the emphasis government put on land for agriculture it is worthwhile to look at the view history places on the importance of agriculture in the progress of a people.

Historically, the beginnings of systematised agriculture in the Near East were considered important to the understanding of the growth of human settlement upon a culture based on a settled existence dependent on a city organisation and all that it entails.

To a great degree, those whom Bill Gammage called 'the men of Sydney' saw this as a philosophical underpinning of their political and pragmatic decision to counter what they saw as the uncivilised way of life on the squattages beyond the mountains.

In the early days of the colonies, when the stock owners were pushing out beyond the 'limits of location' the squattages they took up were left in the charge of men whose concern was to keep the stock safe from marauding aborigines. Even after the first Land Acts were proclaimed the Bench of Magistrates at Wagga Wagga were petitioning the Parliament to advance the cause of agricultural settlement in what was still a highly pastoral region. This they considered would bring in families and commerce. This request was not immediately taken notice of but by the 1880s families were coming into the Riverina from Victoria and South Australia because of the changed circumstances of selection.

The growth of wheat-growing in particular in the eastern Riverina brought not only the farmers but those businesses associated with the maintaining of a healthy farming culture. Churches and schools were needed, doctors and hotels. All this brought with it the good and the bad.

## THE GEOGRAPHY OF THE REGION

The Riverina in its broadest sense is the land bounded by the Lachlan, Murrumbidgee and Murray rivers: the Riverine slopes and plains.

The Eastern Riverina could most probably be said to be bounded partly by the route taken by Hume and Hovell from Yass to Albury. The mountains give way to the South Western slopes, the hill country with only occasional stretches of flat land, and then to the more open landscape which in its turn becomes extensive plains with few notable high points. The area is divided into north and south by the watershed between the Murray and the Murrumbidgee Rivers. The Western Slopes are divided from what is called the Central West by a line running just north of Narrandera and Cootamundra and taking in Temora. The concept of the divisions and the mapping of them depends on the category of landform, climate and usage which is being investigated.

The soils in the eastern Riverina are mostly good textured red loams with sandy loams on a clay subsoil. Gray heavy soils and sandy mallee lie in the western part. Black soils are found in the south-west of the region. The productive soils are interspersed with sandstone ridges with stony outcrops. The fertile heavy alluvial soils along the rivers and creeks produce heavily yielding crops and pastures in the early days, by all accounts; all this area provided the flourishing native grasses to provide the valued pastures for the squatters.

The region is watered by the three rivers as well as creeks and billabongs. The backcountry relies on wells and rainfall storage. The rainfall varies across the region from 12-22 inches.

The trees of the Riverina vary according to the soils on which on which they are grown. Knowledge of the tree cover could help to identify, for the experienced bushman, the nature of the soils which were there. The most common trees of the Region were eucalypts pine, casuarina and acacias. There were few trees for building in any permanent way except white cypress pine, (*Callistris Columellaris*), having the great advantage of being safe from attack by termites. On the other hand the black cypress pine (*Callistris endlicheri*) had this disadvantage. Both species could grow not very far from each other, as evidenced by the location of the tree

cover on the Wagga Experimental Farm. In the southern part of the Riverina

was the slender cypress pine (*Callistris murrayensis*). Associated with cypress pine in the wheat belts was the white box (*Eucalyptus albens*) which would have, like other eucalypts provide the strips of bark which was used for roofs as well as sometimes for the walls of houses, even for chimneys. It had the added advantage of being one of the honey-producing trees.

Along the upper reaches, the River oak (*Casuarina cunninghamiana*) marked the course of the river. On the lower slopes, for instance at Wagga Wagga the River Red Gum (*Eucalypt dawsonii*) and the River Oak overlap. Further down, along the banks of the river, beside billabongs and creeks the River Red Gum is the most prevalent. Blakey's red Gum (*eucalyptus Blakeyii*) is the most common red gum of the western portion of the region. It occurs both on the alluvial and on the well-drained hillsides. While well-grown trees provide shelter the timber in the past has been used mainly for fence posts.

## WHEAT GROWING BEFORE 1890

The first grain used by the new European settlers in New South Wales was that grown at Farm Cove on what was soon recognised as inhospitable soil, to a great depth being nothing but black sand. Governor Arthur Phillip had not been provided with any of the real necessities of farming in the way of tools, the British suppliers including poorly made hoes and axes. There were no ploughs until 1803.

There were in the colony only a few who understood farming: the Rev Richard Johnson, Edward Dods, the Governor's servant, and James Ruse, who had been transported for burglary. In late 1789 the Governor sent Dods to establish Rose Hill (later Parramatta) as a government farm of about 200 acres; James Ruse too was granted 30 acres there, as an experiment to see if a farm of that size could sustain a man and his family in self-sufficiency; the Reverend Richard Johnson who had a farm at Canterbury Vale (now a relatively inner suburb of Sydney)

Watkins Tench in a diary entry for 1790, wrote about what was happening at Rose Hill:

*November 16th 1790*

*Next morning walked round the whole of the cleared and cultivated land with the Rev Mr Johnson, who is the best farmer in the country. Edward Dods one of the Governor's household who conducts everything here in the agricultural line...afforded all the information he could. He estimates the ...cleared and cultivated land at 200 acres<sup>1</sup>. Of these fifty-five are in wheat, barley and a little oats, thirty in maize and the remainder is just cleared for wood or occupied by buildings.*

The Reverend Richard Johnson had come to the Colony as chaplain with the First Fleet, aged thirty-eight and only two years after ordination. He had been a farmer before going to Cambridge University and it is recorded that, on his farm at Canterbury Vale he grew the first wheat and citrus in the colony.

Later, on his visit, Tench recorded an interview with James Ruse, the time-expired convict to whom Governor Phillip granted 30 acres at Rose Hill-Parramatta:

*...I may proceed as fast as I can cultivate. I have now an acre and a half in bearded wheat, half an acre in maize and a small kitchen garden. On my wheat land I sowed three bushels of seed the produce of this country. I expect to reap about twelve or thirteen bushels.... I sowed part of my wheat in May and part in June. That sown in May has thriven best...My land I prepared thus: having burnt the fallen timber off the ground, I dug in the ashes, then hoed it up, never doing more than eight, or perhaps nine rods a day; by which means it is not like the government farm, just scratched over, but properly done. Then I clod-moulded it, and dug in the grass and weeds. This I think almost equal to ploughing. Then I let it lie as long as I could exposed to air and sun; and, just before I sowed my seed, turned it all up afresh. When I shall have reaped my crop I propose to hoe it again, and harrow it fine, then sow it with turnip seed, which will mellow it and prepare it for the next year. My straw I mean to bury in pits, and throw in with it everything which I think will rot and turn to manure...My opinion of the soil on my farm is that it is good to middling; neither good or bad. I will be bound to make it do with the aid of manure, but without cattle it will be bound to fail.*

James Ruse had been a farmer in his native Cornwall before he was transported for burglary and Tench's interview recorded the farming methods with which Ruse was familiar and which most settlers in the colony continued to practise in greater or lesser degree well into the 19th century. For the poorer settlers unable to buy draft animals or the machinery at that time available, farming continued to be an extremely labour-intensive occupation and for them, as it was for Samuel Shumack in the 1860s on the Limestone Plains, 30 acres would have been a large farm.

This failure of emancipist small farmers to thrive made a mockery of the British Government's aim of establishing in the colony a peasant society from the emancipated convicts, almost following the ideas of Rousseau. In Britain in the 18th century peasant society declined when the landlords began to capitalise their agriculture, using new techniques of farming practice and new machinery; in the highlands of Scotland the great landowners began to maximise the production of wool and drove the crofters from the estates, burning down their houses to finalise the move.

The rise of industrialisation and the movement of people into the new centres of industry helped to hasten the process. In Australia there was no evidence of indigenous farming practice as the Europeans knew it, as there had been in the Americas. It was the British agriculture which was transplanted. For the pioneer agriculturalists in Australia it was literally starting from scratch, so there was greater need for capital for stock, for draught animals and the manure which they produced. The rotation of crops to maintain fertility was rarely feasible on a 30-acre farm. The rentier, where his resources as the landowner could be used, would be more likely to make use of this practice, but if one can judge by the reading and the exhortations in the newspapers, many farmers would have scorned it.

From 1788 until the advent of the railways over the mountains, agriculture remained mainly within the Sydney Basin along the Hawkesbury River, north along the Hunter Valley and down the Southern Highlands. In 1804 Governor King sent a contingent to occupy Van Diemen's Land to forestall any French occupation. Agriculture quickly followed and when, between 1808 and 1815, the convicts and military were relocated to New Norfolk labour was in good supply. New South Wales, by 1817 was able to rely on imports of wheat from Tasmania which, for many years, remained the major grain exporter to the mainland.

Australian soils are fragile and with the continual planting of the same crop year after year on the same land the earth became exhausted, the deterioration becoming more noticeable as the nineteenth century wore on. Added to the decline in fertility were pests such as caterpillars and diseases such as rust, smut, bunt and 'take-all', to harass the farmer. It was Governor Macquarie, in the colony from 1809 to 1823, who remarked that there was 'a very great neglect of manuring and otherwise improving their land' and that 'it was too evident to ignore'. James Ruse had made virtually the same observation about the land he was farming at Parramatta-Rose Hill.

The earliest named varieties of wheat which were sown appear to have been English, such as Red Lammas, introduced by an officer of the garrison in Governor King's day. Others such as White Lammas, ripening in England at Lammastide, and creeping wheat, were the main varieties used in 1828. There was no visible differentiation in the seeds of the varieties being used and with the broadcast sowing of



seed so later the crop ripened unevenly and a great deal of grain was lost into the ground to the benefit of mice and other hungry creatures.

## EARLY METHODS AND MARKETS

The history of farming and farmers in New South Wales did not alter in any great degree until the end of the 19<sup>th</sup> century. The same faults in practice noted in the early days of the settlement were still subjects of comment at the end of the century and into the 20<sup>th</sup> century.

From the early days of the colony, by regulation, it was laid down that each convict must receive a basic allowance of grain and meat each week. This was supplied from the Government store for those convicts on public works. Those masters who had assigned convicts working for them could supply the grain and meat from their own land. After 1815 and the end of the Napoleonic Wars, almost half the convicts were clothed and fed by the Commissariat, provisioned with ample supplies of British funds, so farmers and graziers found there a profitable market for their produce. For some colonists, more than others, it was goldmine worth taking the trouble to practise agriculture: John Palmer, in charge of the Commissariat for twenty years had more land under crop than anyone else in the colony; the Reverend Samuel Marsden made an income from his grain, which would have well supplemented his stipend, and without a doubt have financed his missionary efforts in the South Seas.

When there was a good harvest and a glut, the Commissariat store closed and the farmers were forced to sell to speculators with access to storage. When the harvest failed by flood, disease or drought the prices soared, but the small farmers gained nothing. Many were forced by debt to sell their farms, enabling those with capital to aggregate their existing properties, leaving the erstwhile to find other work or remain as tenants on what had formerly been theirs. Other bad seasons could follow and, like Mary Ann Tyler's parents, unable to pay the rent, had to move.

There were others who considered farming too arduous and labour-intensive, preferring the running of stock, as did the Macarthur's. John Blaxland said later: *We did not persevere much in agriculture because we could not manage it with so much other business, only by overseers and under that management we found it a losing business.*

Underlying this was an unfavourable cost structure highlighted by the contrast between profits from wheat and those from pastoral pursuits, marked by the difference in costs for labour and maintenance of that labour. Farm labour needed housing whereas, in general, pastoral workers

could manage with their watch-boxes or even with lean-to's of bark. There were rare large landholders like Charles Campbell at Duntroon who, on bringing shepherds from Scotland, built houses in the manner of a village for them.

After 1825 there was a lack of labour which hampered the larger wheat growers but favoured small wheat farms where the family were the labour force. In most people's eyes at that time 30 acres was considered reasonably large. The lack of mechanisation meant that farm operations were governed by the speed at which the work in the field could be done. Of the two tools used in harvesting for the majority for most of the 19th century, the sickle and the scythe, many chose the sickle. Although it was smaller and did not cut such a wide swathe, it was light enough to have been used in the old country by both men and women. However, in Australia, only men used it. William Macarthur, recording in 1837, said that 31 acres of wheat, at Camden, took seven men fourteen days to complete the harvest.

There was however a steady expansion of the wheat acreage and by 1845, 10 000 acres of wheat was under wheat crop on the coast and 3 600 acres were under crop on the South West Slopes, in the main cultivated by the tenant farmers of the squatters. The extent of wheat planting increased, 10 000 acres by 1860 and 30 000 in 1870. It was said that successful wheat growing by station owners after the 1861 Robertson Land Act, was kept a secret to deter the selectors claiming some of the acreage.

In New South Wales, unlike Tasmania, Victoria and South Australia the lack of adequate transport hampered the extension of the wheat growing areas and wool became king. Long hauls lasting up to three months of wool from Canberry to the port did not present a problem as the wool would not deteriorate but wheat was always subject to the depredation's of mice and weevils. The whaling, sealing and timber getting and wool provided an income from export which enabled wheat to be imported. It was more economic to import from Tasmania and South Australia after its settlement, than it was to bring it from even somewhere like the Hunter Valley or over the Blue Mountains after it was settled. In the early days of the colony when drought and disease affected the crops, grain was imported from India. Where wheat was grown in New South Wales, on stations and around the new towns it was only for local

consumption. The difficulties with transport gradually became less for the Riverina, for instance, as the railway network expanded. By 1858 it had reached Campbelltown, by 1869 it reached Goulburn and by 1881 Albury was linked to Sydney.

Abolition of free grants in 1831 and the introduction of land sale by auction helped the Imperial Governments stated objective of 'concentration of ownership and the subsequent formation of a class of labourers for hire'. Prior to this land policy had been within the province of the Governors who had made free grants of land to settlers, discharged soldiers and emancipated convicts as well as men acknowledged to have made substantial explorations. This created a problem as the land was rarely used for adequate food crops for the general population but for grazing purposes. Sydney was forced to import wheat and other products from the west coast of America with resultant high prices. In 1831 the Ripon regulations were initiated whereby a minimum upset price of 5 shillings an acre (0.4ha) was set on the belief that 'Industrious' immigrants would cultivate the land with profitable food crops. Over the years the upset price rose until it was four times that amount by 1842. This policy was always applied within the boundaries of the Nineteen Counties, but with more and more men looking for pasturage outside the boundaries some degree of regulation and record became necessary.

The Nineteen Counties, proclaimed in 1829, extended from the Manning River in the north to Moruya in the south and to Wellington in the west. The rest of what is now New South Wales and Victoria were 'beyond the boundaries'. But beyond the Nineteen Counties the squatters were outside the limits of the law and its protection and by the late 1830s the Government realised that it could not police beyond the 'limits of location'. These restrictions by the Government had not stopped the dispersion of flocks and herds so it was decreed that the squatters should have grazing licenses, renewable annually. However, this meant that until changes were made in the leasing policy in 1847, the licensees lacked security and thus were not inclined make a homestead and to establish family life, so making the government concerned about the prevailing immorality and lawlessness on these runs. The established policy prevented the establishment of towns and the sale of land but as soon as settlements were authorised, agriculture and wheat growing developed in the neighbourhood. Those who bought land near the towns were not always people totally devoted to agricultural pursuit but what G.L.

Buxton in *The Riverina 1851-1891*, called 'artisan-investors', such as happened in the vicinity of Albury

But whatever the desires of the British Government about establishing flourishing agricultural pursuits, Governor Gipps was to say in the 1830s, '*Australia, it must at once be observed is not an agricultural but a pastoral country, and dispersion is essential to its prosperity.*'

The capitalists in NSW continued with animal husbandry especially when wool growing became a profitable economic enterprise. The weather was less of a hazard than with agriculture, so with sheep the market expanded and export became profitable. On the other hand, for most of the 19th century the middleman (nearly always the miller), and not the farmer, was making the profit. This continued until at the end of the century when the farmers developed a co-operative movement.

There was a differentiation of the land occupiers into graziers and agriculturalists, and there was, with the exception of pastoralists who grew wheat for their own purposes, a concentration of wheat growing around the smaller settlements because of the economic forces of availability of labour, transport and milling. The practice of pastoralists is recounted by Sarah Musgrave in her book *The Wayback*:

*The question of food was a pressing one in my uncle's early life at Burrangong (taken up in 1827), and it was necessary to grow wheat for bread for the household, and oats and barley for the horses. The ploughing for these crops was done with a single-furrow plough, and the harrowing with an all-wooden harrow. The sowing, of course, was done by hand, and the crops were reaped with reaping hooks. The threshing was a tedious and a laborious work. At first the loose wheat stalks were put in bags which were tied up and beaten with sticks, but this method was too slow altogether. So my uncle brought an expert flailsman from Sydney and he, working all the year round, was able to thresh out sufficient wheat for flour and sufficient oats and barley for the stock. The wheat grain was sent to Goulburn to be ground into flour, until my uncle secured two steel hand mills from America...The grain was threshed on an earthen floor and then hand-picked over and sieved and washed to clean it before it was ground. After being ground the flour was sieved to separate it from the bran. It was the duty of one man to grind the flour for the homestead and the*

*workmen had to grind each Saturday enough flour to last their huts for a week.*

In the colony of New South Wales, from Tasmania to Moreton Bay, there was a social dimension which marked farming as being second class; the small farmer was stigmatised by often being thought of as an ex-convict and as nearly all the small farmers lacked capital he could not raise sheep, could not purchase more land and was compelled to devote his labour to tillage, often as a tenant farmer or working for a large landowner. Part of his indenture was being allowed some small acreage on which to farm. Samuel Shumack gave an account of his father being under just such a system with William Davis, the occupier of Ginnenderra on the Limestone Plains in the 1860s after the Robertson Land Act allowed selection. Shumack senior farmed about thirty acres successfully. Then he took up a selection on a portion of Davis' run which was open for selection. While he was with Davis he and his sons set about improving it. William Davis was so sure they would fail and he would be able to buy back the land that he discharged Shumack Senior under the impression that he would come back to work for Davis. In the event this never happened. The Shumacks prospered and acquired more land.

G.L. Buxton in his book, *The Riverina 1951-1891* described one Lutheran family's farming practice in southern Riverina on their well-established farm. When the Klemke children were about eight and nine in the 1880s they were important to the farm operations. Emilie Krause (nee Klemke) in 1964, could remember that after her mother died in 1889 that she would drive the horses with the harrow. As their cultivated land was too extensive for the seed to be cast from a tub hanging from one shoulder, the seats would be taken from the buggy and she, as a little girl sat in front and drove slowly while her father in the back with a bag of wheat would cast it out with both hands. By that time the Klemke family would have been farming since 1861-62 when the Lutherans had made the six weeks trek from South Australia to take up a selection with the other people who had also come.

For the small farmer wheat was the most remunerative crop because not only did it produce grain but there were other products, straw, hay and chaff. Maize, on the other hand, gave a greater grain return without the risk of the 'blight'. However, in the early days in Tasmania wheat gave a greater return because maize was not a successful crop in that climate. There was an advantage to its cultivation as there existed a market for all the products of the plant: wheat to be ground; hay; chaff

and straw as well as the bran and other by-products of the milling process.

Wheat growing was the occupation of the small settlers not from choice, but from necessity. The perception of the lower status of farming saw many of those with ambition to rise drop out of wheat growing.

Australia was different from the old world as it had no peasant groups living in self-sufficient rural villages. Australian farmers had a different perspective of the objectives of agriculture: they were always market conscious. Their plan was to have, over their own needs, a surplus which they tried to sell for the best possible price. In the second half of the 19th century, as more settlers took up land, more infrastructure was needed to make farming a marketable proposition. However, progress was hampered by ignorance of the condition of the land they held and viable farming practices together with lack of adequate transport systems for their produce.

To the English eye in the 19th century the practice of farming in N.S.W. left much to be desired. It was severely criticised by English visitors because it did not have the orderliness of the neat hedgerows, the straight furrows between each headland, the ploughman having often gone around the obstruction of a tree and continued on. The ploughing of a straight furrow was part of a long tradition of farming, a highly trained skill and not many of the settlers or the hired servants of the capitalists, tackling any pristine surface, undisturbed by any machinery since the beginning of time, could accomplish it. Agricultural Societies began to play a role in encouraging the acquisition of farming skills and ploughing matches, first begun by James Atkinson on his farm, Oldbury, on the Southern Highlands in the late 1820s, became popular occasions wherever farming was carried on.

## STAGES OF SETTLEMENT

There were three stages of in the expansion of agriculture in the Riverina. In 1861 there were the so-called Robertson Land acts, properly called the Crown Land Alienation Acts under which there was selection before survey where people could select from 40 to 320 acre holdings. This was thwarted by already established license holders dummying, that is selecting in the name of employees or relatives. Samuel Shumack gives accounts of this in his autobiography, as happening on the Limestone Plains.

In 1884 the Land acts were amended and marked the beginning of the resumption of leasehold station properties which were surveyed into farm blocks and open for selection and the permitting of other members of families to select. In Victoria was not possible so Victorian farmers came over the border.

In 1895 the Carruthers Crown Lands Act allowed for more liberal terms of tenure and greater facility of land settlement. A minority of squatters turned wheat farmers based on share and tenant farming. Share farming had been operating at Iandra near Grenfell from 1892.

The figures for wheat acreages can provide the line of movement of wheat growing. By 1845 10 000 acres was being planted in coastal districts such as the Sydney Basin, the Illawarra and the Hunter, while only 3600 acres was sown on the south west Slopes. The deserted flourmills also give a track of the decline of wheat in certain districts such as Braidwood and Crookwell. By 1879 only 2 687 acres were sown in the coastal districts, rust and other pests decimating the crops. In the southern districts and the higher Western Slopes 10 000 acres were under crop in 1860; by 1870 it had expanded to 30 000 acres and by 1880, 80 000 acres, mainly in the Southern Riverina where settlers had come from South Australia and Victoria and were cultivating wheat. This acreage of wheat amounted to 30% of the States whole. Up to this point wheat growing was not looked on as anything more than being for local consumption; wool was king.

By the end of the 1880s wheat was established as a commercial proposition over large areas of the Riverina and the South West slopes and Wagga Experiment Farm could offer for sale to *'farmers of Australia'* seed of *'the best varieties of wheat, true to name and of the highest*



*possible quality*'. In spite of difficulties of transport, fluctuating prices, rust and drought farmers saw wheat as better than stock. In the last two years of the 19th century 3/4 million acres was sown to wheat, making the state independent of outside sources.

In 1906 in a speech in Parliament one Member said,

*In the south-western division, which includes parts of the Wagga district, Grenfell, Young, Cootamundra, Junee and other centres, 'Wheat is king'...changing from a thinly populated pastoral centre into a prosperous farming locality. ...Big estates have been cut up and disposed of to the wheat-grower, who has in a number of instances been invited by the big land holders to 'step in' and cultivate part of their immense sheep-runs.*

He further commented that it was *'truly wonderful, the transition of the Riverina from an mere sheep walk to an extensive agricultural province is even more so'* citing the growth around Temora and Wagga.

Later in the same speech he gave the history of how the changes came about:

*It is directly traceable to a desire on the part of Victorian wheat growers to continue their operations, and, at the same time sell their land on the south side of the Murray. Hence they came across the river on to Barooga, Mulwala, Tarramia and other Murray frontages, made terms with the owners and started cultivating on shares. Since then settlers from the southern state spread northwards, New South Wales men have come in and farmers from South Australia and other states have been attracted by reports of suitable terms and satisfactory yields, and have done their share in making Riverina the granary of the mother state of the Commonwealth. The districts included in Riverina are those of Coolamon, Narrandera, Jerilderie, Finley, Berrigan, Tocumwal, Mulwala, Corowa, Albury, Culcairn, Lockhart, Urana and parts of Wagga and Junee. The bulk of the wheat is produced in the counties of Urana, Denison and Hume, the two latter extending to the Murray River.*

Denison and Hume contained the farms of the Lutherans who had come from South Australia in the 1860s and later into the 1870s. Denison was to the west of Hume and Urana took in Brookong Station where the manager began to grow wheat extensively to forestall Government resumption for Closer Settlement. Australian estates who owned the Station decided to subdivide it themselves and put the farm blocks up for private sale.

Changes in the land acts in N. S. W. in 1875 made it more attractive for Victorians to select land in the Riverina. Up to that time a man could select less land in New South Wales than he could in Victoria, but the change in the act matched that of Victoria making 640 acres the extent of the selection and the case of Joachim V O'Shaughnessy confirmed the legality of selection by wives and minors, both illegal in Victoria.

At first the Victorians came cautiously before settling up in Victoria, then small groups seeking selection and finally in 1895, what was called a flood. A man near Narrandera reported seeing a line of wagons a mile long approaching the town. It was estimated that for 40 years they were to dominate every closer settlement opening in the Riverina. Most of them came with family, plant and money. The Deniliquin newspaper reporter wrote: *'On Saturday last 10 wagons filled with children...and goods and who have already settled in the district'*. Enquiring of long established farming families round Wagga Wagga and Temora their origin was in Victoria, first of all running stock but later taking to wheat farming.

## WAGGA WAGGA

West of Gundagai in the 1840s the squatters who followed Sturt's path down the Murrumbidgee were beyond any settlement. Wagga Wagga, as a stopping place, like other new settlements in history was made by the river crossing. There was a ford in the river at that point now called the Wiradjuri Reserve. It appears that the first establishment was a blacksmith's shop.

At Gumly Gumly, John Peter had married the widow of Michael Bourke, the previous occupier and was now an important man in the district. Further down the river Best had a run which adjoined. What these men wanted was a Bench of Magistrates to deal with any miscreants, but to do so they needed a proclaimed settlement and Court of Petty Sessions. The petition was made in 1847, and Wagga Wagga was gazetted as the place for holding the Court. Although transportation of convicts was about to stop to New South Wales, there were still convicts under sentence of transportation in the colony, as well as ticket-of-leave men and ex-convicts. Wagga Wagga was proclaimed a township in 1849 and the town surveyed.

The town began to be built in the space between the river end of Fitzmaurice Street and Wollundry Lagoon. What were considered necessary businesses were established, hotel, store, coaching post. North Wagga Wagga was separate across the river.

Energetic business and professional men and women came to Wagga Wagga and the town grew in spite of drought depressions and floods. It became the centre of the area, with towns no nearer than Gundagai, Albury and Narrandera. It provided a business and social centre, with a very clear sense of social divisions between what were called the 'silvertails' and the hoi-polloi. While socials, and balls were open to all, the dance floor was divided off for the two halves and everybody for a time kept to their place, albeit unwillingly.

Sport, particularly, horse-racing, ploughing matches, and footraces, became established in Wagga Wagga.

It became the centre of radical politics and the first workers newspaper, *The Hummer*, began in Wagga Wagga, later became *The Worker*. *The Wagga Wagga Advertiser* devoted a number of issues to the shearers strike at Brookong Station and the subsequent trial before Mr Justice Windeyer. The district, by the 1890s, did not always return candidates who supported the pastoralists. The electoral district at that time included Narrandera. It was in Wagga Wagga that the first conference of the Farmers and Settlers Association was held in 1892.

## NARRANDERA

Narrandera had its beginning at Gillenbah, about two kilometres east of the present town, but the floods forced the move to the present site. The town lies along the western rim of the south West Slopes with an average rainfall of 400mms, mild winters and hot summers. The districts rich red earth has produced average wool but good grain on some of the finest wheat land in Australia.

The town, like Wagga Wagga, is on a river crossing and served in this for the movement of sheep and cattle and sheep from the north of the colony, as far as Bourke and beyond on their way to the saleyards on Melbourne.

Narrandera was the centre of wide pastoral holdings on either side of the river. However after 1861 and selection without survey, selectors began to move into New South Wales from the south. Narrandera began to grow, catering for the drovers, teamsters and farmers, as well as the employees on the stations. For a time Narrandera was as the most industrialised town in the State, with wharves, for the river trade, wool scouring works, sawmills and in 1899 the Wise brothers set up a Flourmill. It was not until 1900 that any wheat was shipped away from Narrandera.

At one time it had the largest Chinese Camp in the country, providing the gangs clearing the timber on the stations and running market gardens. A report by Police Superintendent Brennan and Mr Quong Tart gives a description of the extent of the camp, its buildings and inhabitants.

## TEMORA

The early occupation of lands by Europeans in the Temora district appears to have been taken up and gazetted as the occupiers holding depasturing licences, between 1836 and 1849. Narraburra Station seems to have been the first to be mentioned, followed by occupation of Combaning, which was a watering place on the road from Sydney to Port Phillip.

William O'Brien was a morality tale of the times. He was a squatter on Gundbindyal run, three miles south of Springdale in 1847. He grew wheat on the run to feed his stock. 1849-50-51 were disastrous drought years in the district. All his stock died but he was determined to grow wheat. He walked 60 miles from the station to Binalong carrying the ploughshare to be mended. He bought more horses in Binalong and the drought broke. He kept growing wheat, but had no way of marketing it. In the end he had three years crops stacked in sheaves in bark sheds but when gold was discovered in Forbes in the early 1860s there was a wheat shortage. He threshed his wheat, using horses to thresh the grain, winnowing it in the wind. He carried it to the diggings in three wagons, selling it for £1 a bushel (4 days wages for a workman). O'Brien was back on his feet. His is not the only story of men and women refusing to buckle.

The first selection in the district was 120 acres taken up by Charles Cooper on the West Bank of Narraburra Creek in 1860. He was believed to be a hotelkeeper and in the days of Lambing Flat gold the track along the creek was the main road to Victoria. It is believed that another hotelkeeper took up 40 acres in 1873. In 1875, John Trefle, a French Canadian, came up from Hamilton in Victoria with a herd of dairy cattle and was another of those who hung on and acquired a large holding through buying up the land of others as they left. He was following a common practice, both then and now, for provident farmers.

In 1880 closer settlement began when 'stalwart and experienced' young farmers from Victoria and South Australia and southern Riverina arrived. The growing population needed the wheat that would be grown. There was further movement into the district when German settlers, outgrowing the family farms in the south took up land at Trungley Hall.

Wheat growing was becoming established and proving to be a viable industry.

By 1884 and the change in the Land Act, Robert Muir arrived and he and his family, each one allowed by the law to make a selection, took up 3 200 acres. Others came about that time and selected from 900 to 1000 acres.

Temora did not start as a rural hamlet like other new towns in the Riverina but was a roaring gold town when the site was chosen by the mining warden from Braidwood with about 20 000 people in its heyday. The first gold was found in 1869 but was disappointing. The same year gold was found at Sebastopol on the southern boundary of Temora station.

The peak numbers diminished as new gold fields were discovered and people moved on. According to an old map of the area, there were three towns, with the so-called Government town in between, occupying the ground where the business centre of the town now is. It was now that the town was supported by its rural district who had become relatively prosperous on the back of the gold rush. In the 1880s the townsfolk decided that they wanted a flourmill and shares were sold in a company. The mill appears at that time to have been managed by Ned Gardner. It was in operating until well into the 20th century when flour milling was rationalised by takeovers by the big mills.

By 1906 Temora had become one of the leading wheat producing districts. In 1913, the Temora Experiment Farm was among the new Demonstration Farms established by the Department of Agriculture at that time and it was worked in co-operation with the Wagga Experiment Farm and later with the Wheat Research Institute. It appears to have been established on the site of one the three 'towns' of Temora and which was to be named Watsonford.

## HENTY

Henty came into being with the extension of the railway system from Sydney to Melbourne when in the 1880 the line was reaching to Gerogery. The district itself had long been occupied, first by the squatters and then the selectors, particularly the Lutherans from Victoria and South Australia in response to the Land acts of 1861 and those following.

Kevin Terlich, of one of these pioneer families wrote a non-fiction/fiction account of his families arrival:

*The wagons were loaded with beds, buckets, tubs, tin trunks, clothes baskets and cooking utensils--frying pans, pots, boilers and camp ovens. On each side of the wagon wooden barrels to carry water were strapped. Inside the canopies, hanging from the centre rail were hams, bacons and sausages.*

Further on he wrote about other settlers coming and how basic the beginnings were: *They were ready to give Dad two days work for a few bags of wheat to sow their own crops the next year.*

As closer settlement and conditional purchasers increased the town began to come into being to cater for the railway workers and serve the farmers. Mr Rosler opened his store in 1884 and the town plan of the village of Henty was produced in 1887.

Henty was a rural town dependent on farm industries for its existence. Although it had no flourmill as wheat went to the flourmill in Albury, it did have flourishing hay and chaff industry. There was enough produced to export out of the town to Melbourne and Sydney. While the need for horses as part of the farm these industries were viable and remained so from 1899 until about 1938. Farming was a permanent ambition for young men in the district, many leaving to work elsewhere until they had enough money to return and buy a farm, or move further afield.

This district was a solidly based one and among the Lutheran settlers, men chose their wives with extra care, knowing that the lives



they expected them to lead would be extremely difficult. Women, mindful of

this, trained themselves to such a degree of health and strength that when they were raising their families they were able to instil into them the blessings of a sound mind and body. This was a reflection of one of the oldtimers when the centenary book on Henty was being compiled. The farmers in Henty like many others in the Riverina worked on a half-produce-half cash arrangement with the stores in the town.

It was a population where any thing as rarely wasted and solutions to problems were sought and resolved. In this context, Headlie Taylor has his place in the history of agriculture and of Henty.

## COOLAMON & GANMAIN

While these two towns are the product of the railway lines and wheat growing, there was settlement in the district before the railway was put through. It appears that the Stinson family occupied Kindra near Coolamon and Coolamon Ponds was a water supply. James Devlin had taken up Ganmain Station west of Kindra. It is said that the Stinsons planted the first wheat but were very secretive about the fact, frightened that the selectors would take part of his land. In fact, by the 1880s the big stations were what, Mark Brennan wrote, in Coolamon '81 for the Coolamon centenary celebrations, 'in retreat' before the influx of selectors taking up pieces of the old leases which had not been made freehold. 1881 marked what was then a triumph of technology, the opening of the railway from Junee to Narrandera, bringing to both Coolamon and Ganmain businesses serving the surrounding district.

However, in both places wheat became the leading rural industry rather than stock. Ganmain became, like Henty, a flourishing hay and chaff centre. In Ganmain there were expert haystack builders like the Carroll Brothers. The stack builder's work was, and still is, the sight of the district, watched and emulated by, many of the district farmers. When it was time for chaff cutting, Logan and Hichens would take their steam engine and chaff-cutting machinery to the farms and it would be done on site.

Coolamon was described in 1885 as any having its origin four years before but already being the centre of a thriving timber and wood trade and as being '*advantageously placed in the midst of a thriving population of farmers and selectors*'.

William Pyke, born in Devon, had arrived in the district in about 1875 with travelling saw-milling equipment, but not very long after bought two acres in the town on which he established a mill building for his saw-milling operations. His timber was sent off as far as Yass and Wangaratta. By 1887, as wheat became a bigger enterprise in the district, he began operation as a flour miller, Devon Roller Flour Mills. He had started with the new technology and no doubt the machinery which would have run the sawmill would have served to run the flour milling machinery. The mill continued, until like Temora's mill it was absorbed into Allied Mills with the rationalisation of the industry after World War II

## JUNEE

Like other towns in the Riverina, Junee was established on land resumed from a squatting run, Junee Station, first taken up by de Salis and Smythe. The original town, now known as Old Junee, lay on the stock route from the north to Wagga Wagga. Five miles east of Old Junee, Junee as we now know it was a product of the railway and was known as Junee Junction. The settlement, which grew there, was initially called Loftus after the then Governor. Junee Junction was part of a Mr Crawley's land, and he had a view from his house, Monte Cristo overlooking the proposed railway. He took his opportunity and built a hotel store and a private school.

The town had population of 20 in 1876, with 200 in the district, with a coach service into the town tri-weekly. By 1887 after the Sydney to Melbourne rail finished and the proposed branch line to Narrandera, begun, there was a population of 2000. Water was always a problem and the first water came from a well in Crawley's paddock on sale at 10/- a cask and when the line as extended to Wagga Wagga it came by train from there.

Ian Dunn in *Byways of Steam* wrote that the town focussed on the activities of the railway and that the finest building in the town undoubtedly the Whitton designed station, in a French Second Empire style, much too large for the needs of the community, but necessary for railway administration.

The railway workers were on shift work; short time meant that earnings could be light but on the other hand in a good wheat season there was overtime for all grades and fatter pay packets. The Junee businesses suffered the lean and good times with the railway workers. The railway and agriculture, hand in hand, were the mainstays of the town. In 1882, a flourmill was proposed and the Town and Country Journal correspondent was urging the backers to hurry with it. It was built and the building stands beside the Narrandera railway line, a brick structure of Victorian industrial architecture.

## POST WORLD WAR I

Wheat production was put under government control with the Wheat Acquisition Act of 1914 under which farmers were required to sell their wheat to designated buyers licensed under the act. It was really the first of a long line of government control of the growing of wheat and its marketing.

After the War the returned soldiers were settled on farms, sometimes in viable areas like Tarcutta, sometimes in marginal areas like the Hallston district. The weather, the soil loss of fertility and diseases of wheat that had been the bugbear of the prewar farming experience were still present. Added to these was falling quality of the wheat so that exports were declining. The old varieties of wheat, as had been predicted, were declining in quality, the research had almost ceased into the values of wheat other than yields. When Stephen McIndoe, a Farrer Scholar went to the USA to follow post-graduate study, the Americans were surprised at the decline in wheat breeding from the heyday of the beginning of the century.

One of the pressing problems for which it was difficult to find a solution was the infestation of skeleton weed. The plant, which is not native to Australia, was first observed at Coursing Park before the war and although of interest, it was not regarded as being a cause for concern. Two years later in 1913 it was found growing along the road to Marrar by Ernest Field.

Now it was of some concern because the long, wiry and tough stems of the weed wound themselves into the harvesting machinery and could only be removed with considerable difficulty. It was difficult to eradicate by any normal means, the root system went over a metre into the soil.

At first only in the Wagga Wagga district, during a period of drought in the 1930s, it was transported in hay into Victoria. Research went on at the Wagga Experiment Farm into the problem. Experiments were put in train, especially with dryland lucerne and subterranean clover. By 1935 it was of such concern that a reward of £5000 was being offered for a solution to the problem. The Council for Scientific and Industrial Research sent scientists to help with the problem, while farmers in the

district had their own experiments with would-be competitors such as Wimmera Ryegrass. Skeleton weed remained a problem until the 1950s and the introduction of herbicides.

One important form of co-operation used to find a way to eradicate the pest was the work done by interested farmers on what were known as Farmers' Plots which ranged in size from 1 acre to 20 acres. These had been an idea of George Valder's in 1903 when most wheat and fertiliser trials were conducted on that basis. In 1908, the Director General announced a new initiative making Valder Chief Inspector, with responsibility of selecting and laying out the plots. An Agricultural Inspector was appointed to each one of the five divisions of the State including Wagga Wagga. These numbers were increased as time went on and the number of plots increased.

Motorisation of farm machinery increased although many farmers were reluctant to change from horses to tractors. In terms of time the tractors could work more quickly but in terms of cost the horse teams were cheap to buy and the feeding came from the farm itself. Post World War II students were trained in the use of horses until about 1954.

In the 1920s wheat farmers were encouraged to have mixed farms, combining sheep with wheat. The ideas and directions were promoted through the *Agricultural Gazette*. In this period, the Agricultural Bureau Movement, which had begun in 1910 to counteract the lack of educational leadership of the Show Societies, underwent organisational development with appointment of a special officer Charles Crane, an education officer at Wagga Experiment Farm. Its first district conference was held at Wagga Wagga in 1922 and the first State Conference was held in Sydney in 1923. The Bureau appealed to both men and women having field days for their benefit. It reached its peak in the 1930s. After 1945 more specialised groups were formed relating to different forms of farming.

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|--------------------------|
| MACHINERY AND TECHNOLOGY |
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The following table lists innovations and inventions which were valuable for the Riverina.

|      |  |
|------|--|
| 1843 | Australian stripper invented by John Ridley  |
| 1876 | Stumpjump plough invented in S.A.<br>'Mullenisation' developed by Jack Mullens       |
| 1877 | Daily weather charts released to the press   |
| 1880 | Queensland Government offers a reward for a remedy for rust on wheat                 |
| 1884 | Stripper harvester was demonstrated and patented by H.V.McKay                        |
| 1886 | Farrer commenced his research into new wheat varieties.                              |
| 1892 | Wagga Experiment Farm begun  |
| 1894 | "Comeback" wheat variety developed by William Farrer                                 |
| 1889 | Farrer commences crossbreeding wheat.  |
| 1890 | First Intercolonial Conference Rust-in-wheat.  |
| 1891 | Second Rust-in-Wheat Conference.   |
| 1892 | Third Rust-in-Wheat Conference   |
| 1894 | Fourth Rust-in-Wheat Conference  |
| 1898 | Farrer joined the Department of Agriculture as wheat experimentalist                 |
| 1901 | Farrer introduces Federation wheat variety   |
| 1902 | "Comeback" wheat released.   |
| 1906 | First Commonwealth statistician appointed.   |
| 1907 | First Commonwealth meteorologist appointed   |
| 1908 | Introduction of the three bushel bag   |
| 1910 | Faculty of agriculture established at the University of Sydney                       |
| 1911 | Auto Header invented by Headlie Taylor.  |
| 1913 | Temora Experiment Farm begun<br>Condobolin Experiment Farm begun.                    |
| 1914 | Tractors introduced to two experimental farms.                                       |
| 1918 | Introduction of bulk handling of wheat introduced in New South Wales.                |
| 1920 | Copper carbonate dusting for the control of bunt/stinking smut in wheat              |
| 1926 | Establishment of CSIRO   |
| 1927 | Formation of Plant Breeding branch in the New South Wales Department of Agriculture. |

- 1932 Introduction of the Fertiliser Bounty Scheme  
1954 Wheat research Institute established at Wagga Wagga

This series of events mark the progress of wheat growing and the increasing acreage, as well as the perceived decline in the value of Australian wheat. With these fluctuating fortunes the input of government was designed to educate, support and develop the industry and its participants.

The 1877 entry was possible by the use of the telegraph and the proliferation of newspapers through the country at that time. They were either tri- or bi-weekly in most cases, but they were widely read, providing as they did most of the information considered important to the farmers.

The 1880 Queensland action was at the instigation of Dr Joseph Bancroft, a Brisbane medico who did considerable work to improve agriculture in that state, including being on the Commission to investigate the eradication of the rabbit. He and Farrer exchanged ideas and information and it was through him that Farrer was introduced to his overseas correspondents relevant to his ongoing work on wheat.

1918's introduction of bulk handling was the fulfilment of Nathan Cobb's urging on the New South Wales the need to follow the north American example in storage and handling in order to reduce the damage by weather, mice and weevils on the stacked wheat. He did indeed build on the Wagga Experiment Farm in 1897 an elevator for the storage of wheat. It was labelled by the sceptical, 'Cobb's Folly'.

In the latter part of the 19th century there were introduced into agriculture certain features which lead to a different concept of farming and some new classes of rural occupation and the decline of others. One of the big changes in the economics of farming was the introduction of more sophisticated machinery for various operations in the farming calendar.

The reaping hook and scythe had given way to a large extent to the horse reaper, devised in South Australia by John Ridley in 1843, which needed less labour and could take less time to reap the crop.

One of the pieces of machinery which changed over time was the plough. To a large extent the plough, used by the settlers for almost the whole of the 19th century was the single mouldboard drawn by bullock or

horse, or in extremes by a person. The bush 'manufacturer' took the timber that was suitable and made his plough. The Honeysuckle trees which grew near the river were used to make the foot of the plough, a piece of red gum with the right twist for the mouldboard and the iron share from the blacksmith. The iron share needed to be sharpened frequently as it blunted in the ploughing, or if it broke it had to go back to the blacksmith for repair. Changes came with the broader acres and the need for speed. The number of ploughshares on the machine increased and the disc plough was invented which did not turn the furrow over like the mouldboard but opened up the furrow. The extent of the number of shares on the plough could be up to 11 or 12 feet in width.

The stump-jump plough was a machine which was for a special purpose and is said to have come about quite by chance. It was made to be used in the scrubby mallee country, where the share was on a spring which lifted up if it hit a stump in the ground.

Modifications to machinery took place step by step as acreage expanded and wheat growing became more widespread. Machines were being developed for almost complete harvesting of the crop as well as for other seasonal operations. Although American, Canadian and British manufacturers had good access to the Australian market, they had the difficulty of having to develop machinery, in their own country, for the peculiar conditions of the Australian wheat areas.

The Australian firm of H.V. McKay found a niche in the Australian market for his machinery. It began with his invention of a harvester in a Victorian farm workshop, made from old pieces of machinery and kerosene tins. It combined the harvesting and winnowing operations. It had the advantage over the Ridley stripper that it could be used for harvesting early in the morning and later in the evening. The stripper would not work properly unless the crop was completely dry. The McKay harvester was patented and manufactured in 1884.

In 1911, a young man from Henty, Headlie Shipard Taylor, decided to teach himself engineering and looked for a solution to the problem of tangled and lodged crops. Both tangling and lodging of the ripe wheat were likely to occur after rain and storms. He succeeded in



designing and building an header which lifted the tangled crop and cut the heads off rather than beating them off as McKay's machine did. He demonstrated his machine for McKay when he came to the district and he soon joined

H.V.McKay and went on to develop the Auto Header. The result of Taylor's work was that farmers could harvest crops which had been given up for lost.

McKay's was not the only firm making harvesting machinery and the overseas manufacturers were also competing in the market. All this machinery made it possible in the Riverina to farm greater acreages because the work could be done more quickly and fewer men were needed.

In 1914, under the exigencies of producing wheat for Britain, the department introduced Caterpillar tractors onto two experimental farms, Trangie and a new area opened up, Woodlands Wheat Area west of Parkes. They were in addition to using the steam engines for traction and had the advantage of being to work on wet sodden soil. At Trangie they were in use for 24 hours a day so that 1 600acres as prepared quickly. They were transferred to a departmental enterprise near Tullamore. The Daily Telegraph reporter wrote in October 1915:

*The caterpillar tractors--a new thing in agriculture here-- were sent up from Sydney- and indeed appear to have come from America--without providing for duplicate parts....Now there is an efficiently-equipped repair shop on the farm-- built of empty benzine cases certainly but none the less efficient--where Mr Hart, who is a thoroughly capable and practical engineer and a man of adaptive genius, with the assistance on a turning lathe and other appliances is able to make his own duplicates and effect any repairs necessary to either engines or machines. With regard to breakages of plough discs or parts the explanation is this. At the outset-- each caterpillar tractor draws two 11 furrow ploughs--the second plough was coupled rigidly to the tail of the first with the result that when a 'blind or submerged stump was struck by the front plough it was held so that the spring 'jump' device could not do its work properly, and the effect was either a broken bearing or spring, or else the tail was wrenched off. Mr Hart has now coupled the ploughs with a*

*sort of compensating balance which has got over all this difficulty...*

*The superintendent is thoroughly satisfied with the caterpillar tractors as ploughing power... 'It is of course new to Australia... Each draws two 11 furrow disc ploughs covering about 13 feet and averages 2 acres per hour or 13 acres per day of eight hours.*

*For harvesting there were eight Massey Harris binders, built on the spot.*

A new way of doing things had come about with the mechanisation of farming. There were changes to in the skills which the farming community needed. Instead of a man being an expert in swinging a scythe or using a reaping hook, he now had to know how to handle a team of horses and the local blacksmith found himself with problems of machinery more complicated than that of mending a broken ploughshare. Some men needed to learn the intricacies of the steam engines to be used in chaff cutting and the more complicated use of ploughs and harrows. After 1913 the new skills of tractor maintenance had to be acquired, although it was not until the 1950s that the horses finally gave way to the tractor.

The machines gave the ambitious man the chance to make some progress even if he had no land of his own. It was estimated that the cost of a set of farming plant in the 1890s would cost a man £400. With all or even part of this he could take up share farming. It enabled poor men to start and the big landholder to farm their land at a profit without a great outlay in plant.

Before the days of the tractor, machinery had to rely on the draught horse for traction and so the breeding of these animals was a profitable sideline and there was, for a period, among the stud -stock breeders, those who fancied not only Clydesdales, but the Suffolk Punch and the Percherons. It was only with complete mechanisation that these animals ceased to be the spectacular ring attractions at the district shows.

WILLIAM FARRER

Although an increase in acreage was taking place in the wheat lands of the 1880s, the quality of the wheat, the rust which attacked it and the lack of a variety which would do well in lower rainfall areas, attracted the attention of William Farrer. In 1873 he had written about the lack of concern with sheep farmers problems, *'here a morbid, overstrained and generally misdirected policy of economy seems to be paralysing all true progress.'* By 1882 he had become interested in a theoretical way with the problem of rust on wheat. It had always been present in the crops in the Colony but nobody knew how to attack the problem. Farrer wrote letters to the papers with his ideas.

When he retired from surveying he finally set about a practical approach to the problem which he said could be solved by selecting the right plants which were free of the fungus and plant those seeds. By 1899 he was not only selecting but crossbreeding and consulting with other researchers all over the world.

Bobs was the earliest of his successes to be grown in commercial quantities. The initial field trials in 1894 showed that it was capable of a high degree of rust resistance. However, it had been developed over the drought period and later sowing's after its release in 1902 proved that it was not as rust-resistant as Farrer or anyone else would have wished. It did however, produce flour which had a greatly improved baking quality and at the time apparently rescued the milling industry in at least two districts, Gunnedah and Corowa, according to George Sutton, before more suitable varieties were introduced.

Farrer's crosses were complicated and were said to be like the breeding of comeback sheep, Farrer thus giving the wheat variety its name, Comeback. Further, Farrer considered Comeback his greatest triumph as it was rust-resistant and to produce flour of such high baking quality that it was in extreme contrast to the existing quality of the average Australian wheat at that time. It did have the drawback of being only a moderate yielder in most Australian wheat districts. It was reasonably disease-resistant and in its baking quality and milling value equal to the best in the world. It proved Farrer's contention that the strength of Australian wheat could be improved and in the course of the improvement which were made by his breeding work, Australia became self-sufficient in hard wheat--no longer needing Canadian wheat for blending to make satisfactory flour. Comeback was fixed in 1894 but not released until 1902.

The wheat which made his name a household one was Federation. This was wheat was in a sense bred to specifications: to facilitate mechanical stripping. It was bred and selected for short straw. The straw stood up well and did not lodge, a condition which made harvesting difficult. The ears of the slant were comparatively short, compact and did not shed its grain as did a wheat like Steinweidel. However, it was not nearly as an attractive sight in the paddock as the older showy varieties. Arthur Streeton had painted 'Golden Summer' with the summer light on the golden wheat paddock. It was romantic painting, fuelling the love affair Australians were having with the romance of the bush in the early part of the 20th century.

George Sutton said that the share farmers on Iandra, growing Federation for the first time did not see a field of golden grain but a field of bronze coloured wheat and they were quite disheartened as they thought the yield would be minuscule. Sutton, when further commenting on the controversial colour of the new wheat, said that when the Government Printer wanted photographs of a wheat field for a booklet aimed at future farmer migrants, he found the colour was wrong for the image they wanted to present to British farmers. They would think that Australian land and wheat culture was not worthwhile and not worth the effort to come round to the end of the world instead of going to Canada.

By 1910 it had become the most widely planted variety in New South Wales and pushed the margins of wheat growing further into the lower rainfall areas. Before he died in 1906 he had produced over forty new varieties, all trialed either at Wagga Experiment Farm or at Cowra Experiment Farm.

The new varieties were augmented by the use of fertilisers, such as superphosphate, the result of experiments by Professor Custance at Roseworthy Agricultural College in South Australia. Fallowing was encouraged and even into the 1920s advertisements papered in the Agricultural Gazette reminding farmers to fallow their paddocks.

Other plant breeders followed in Farrer's footsteps and although in the 1920s and 30s fewer new varieties were produced in NSW, from 1954 the work became more intense with the establishment of the Wheat Research Institute established at Wagga Wagga.

## SHARE FARMING

Share farming became a profitable enterprise for the landowners after the fall in the price of wool. Share farming on Iandra, begun in 1896, was an immense enterprise on approximately 50,000 acres (25,000 hectares Approx.) with enough wheat grown and harvested by the sharefarmers to justify its own rail siding and village for his workers. Other landholders in the Riverina adopted the practice. It had benefits for both sides of the equation: the landless man could build enough capital in good years and the landholder could have his land cultivated without the capital expense of plant. Anthony Brunskill, for instance, was able to recoup his losses on Bon Accord by share farming on Big Springs.

The share farmer signed a contract with the landowner as Ernest Simpendorfer did with Thomas Keighran the owner of Doodle Cooma in the Henty district. They agreed that Simpendorfer be paid 'seven shillings and sixpence (workman's day wage) per acre to harvest with a stripper and clean with a winnower about 90 acres of wheat and oat crop...and properly fill and sew up all the bags' He was to sew them up in places where they could be loaded up. He was to be paid at the end of the work. A similar agreement was made by share farmers in the 1930s on Munyalpa Station also near Henty.

Gobbagumblin had 42 farmers operating on the either the share esteem or as tenant farmers. Big Springs could claim to harvest 20 000 bags of wheat in 1913 as well as a good quantity of hay under the system.

## DISEASE, DROUGHTS, FLOODS AND FIRES

### RUST IN WHEAT

Of all the diseases in the crops which affected the wheat growers most from the beginning was stem rust, already existing in Australia when the contingent from the First Fleet stepped ashore in Port Jackson. In all probability its host was what became known as Common Wheat Grass, *Agropyron Scabrum*. Professor W.L. Waterhouse, who became an authority on rust in wheat, quoted an extract from The Memoirs of Joseph Holt describing what would have been a common experience for the wheat grower.

On the 21st October, 1803, a more beautiful appearance of a successful harvest never flattered the expectations of a farmer; it was within three weeks of being ripe, the ears full and plump, the straw clear and well-coloured and in every respect it was gratifying to look at. In three days it was completely destroyed by rust and the produce of 265 acres was not worth £20. This extraordinary blight which I believe peculiar to this country is produced by fogs which come on suddenly and obscure the sky for some days, and if it happens when the wheat is nearly ripe, it inevitably destroys it. It covers the whole straw and ears with reddish powder, like rust of iron, which falls off as you walk through the standing corn.

In a book entitled '*The Adventurous Memoirs of a Gold Diggeress. 1841-1909*' by Mary Ann Tyler nee Brookesbank, and published by Kate Gibbs in 1985, Mary Ann described the effect of the rust on farmers at Airds, near Campbelltown, in her late childhood;

*...wheat was one shilling a bushel. What beautiful wheat there was before the rust took over. We gave up our farm at Denfield. Rust took over the wheat completely.*

A little later she took up the story:

*Every week father went with two loads of hay and two of his men would cart it with trucks. It looked really nice, the way it was stacked and had such a nice smell. New cut hay always has a fascination for me. But when the rust took over, the four men who had been helping father reap the 40 acres*

*looked like red foxes-it was so rusty, and so the downfall of the farmer.*

She went on to comment on the loss of the farm:

*I realised my parents were not well off since the rust took over the wheat. Farms were no good. Rents could not be paid.*

Until later in the century the wheat varieties then being grown were always liable to rust. In the 1860s, in the gradually expanded wheat areas, there was a severe outbreak of rust. Samuel Shumack in his autobiography gives a description of its appearance on the Limestone Plains in the mid-1860s:

*...Donald Cameron was on Gininderra, where William Davis had a paddock of wheat which was the admiration of the district. It was over six feet high and was as level as a table from one end to the other. It was a late crop and Davis had obtained the seed from America. He asked Cameron what he thought the yield would be and Cameron's reply was '50 to 60 bushels to the acre at least if it is all like this end.' 'Come Donald, we will go through and see', Davis said. It was a hot day and both men wore white coats and although they were not short men the crop was inches over their heads. I have never seen its equal and I had to climb on to the fence to see over it. When Cameron and Davis emerged from the other end of the crop their clothing was red--this was their first experience with rust. A few days after the press reported rust in many parts of the State. This crop yielded sixteen bushels to the acre of pinched and milk-white grain.*

The English wheat varieties suited the moister climates because of their longer growing period but they were always plagued by rust epidemics. Indeed by the 1870s wheat growing in the colonies looked insecure, without fail they would be attacked by rust. It was becoming more profitable to plant other crops and then to import the grain. Farmers began to realise that other crops such as maize could be grown in those parts on the coastal strip subject to repeated rust attack. The drier parts of the colony, on the other hand were subject to hot summers which would wither the later maturing varieties, especially in New South Wales and South Australia.

New South Wales was backward in its approach to farming. Forward-looking farmers elsewhere were strongly advocating farming practices with intensive cultivation, regular rotation, heavy manuring and a dependence on high crop returns from small farms. Not only in advances in farming practice but New South Wales lagged behind Victoria, not moving inland over the Blue Mountains farming until 30 years after Victoria opened up her interior. The mountain range was at the time the limiting factor in this matter until the advent of the railways.

Rust was the problem which galvanised governments into taking some action. The years 1888-1899 marked an epidemic of rust in the all-eastern wheat-producing colonies of Australia, including South Australia. In 1890, both the colonial governments and influential sections of the community were supporting efforts to find a solution and in that same year the first Intercolonial Rust in Wheat Conference was held in Melbourne; Agricultural Societies in New South Wales were conducting trials among farmers to accumulate detailed information about the state of crops and the conditions affecting the development of rust in wheat. The newspapers continued to be the communication link for the public as to what was happening; reports and letters were printed containing ideas and observations.

January 1891 *The Australasian* reported that the Riverina had been visited by locusts, rains and floods. In the same issue it was reported that experiments were being carried out at Port Fairy in rust in wheat, and the connection between the use of shrivelled seed and healthy seed. These experiments were being carried out by the chemist attached to the Victorian Department of Agriculture. The observation was that the current season was only slightly less rusty than had gone before.

In 1891, *The Australasian* and *The Albury Border Morning Mail* and *The Wagga Wagga Advertiser* all carried the account of the trials conducted by the Albury Pastoral, Agricultural and Horticultural Society. *The Australian* quoted Mr Morton, of Kilnacroft at Jindera as saying that deep tillage and drainage were necessary to check rust but that he was in favour of early sowing. He considered that May was soon enough as early-sown wheat had other enemies to contend with besides rust, for example 'take-all' which was quite as destructive as rust. None of the earlier sown crops round Jindera escaped rust. On the other hand *The Wagga Wagga Advertiser* reported more fully the conclusions of other farmer such as Mr Zweck and Mr Odewahn.



## DROUGHT

Drought was a natural disaster which could break both agriculturalist and pastoralists alike. There were droughts which achieved historical proportions: James Gormly later in his life recalled the severe drought of 1850-51 when no rain fell during the winter of 1850, the season in the Riverina when rain was always expected. There were no crops and meat was unobtainable. This disastrous two years were followed in 1852 by a flood so severe that it washed away the town of Gundagai, which at that time as on the river flats, leaving one building, the flour mill. Further down the Murrumbidgee the floodwater spread over the riparian flats. As in Gundagai houses were washed away and people drowned. The water as now took months to join the Murray and on to the sea.

The drought years of the 1890s and in the first decade of the 20th century were droughts which had effects on the trade and commerce of the state as the banks collapsed and overdrawn farmers went to the wall. The older sharefarmers and the tenant farmers giving evidence to the hearings into the Closer Settlement of Gobbagomblin recounted how their losses in the drought affected them. Later on the 1930s the effects of drought forced the government to institute a system of Farmers Relief especially for those who were wheat farming in the most marginal areas as for instance around Hillston.

Drought is more common than the good seasons and it would seem that only those who practised good land husbandry could ride out the bad years, leaving those who failed to become the farm labourers.

## FLOODS

Floods were, in the past, the second natural disaster which could devastate the wheat farmer but the building of dams on the Murray and Burrinjuck on the Murrumbidgee have served to mitigate the severity of the damage. While floods took their toll, the disputes over water in time of shortage have lead to lawsuits and the locking up of wells. Mary Gilmore in *Old Days Old Ways* remembered the stories of conflicts over water when Samuel McCaughey decided to dam the creeks which other men relied on for water. There was not only armed resistance but a lawsuit, *Blackwood v McCaughey*, which McCaughey lost. It was after this that the dam was built at Barrenjack and kept under government control.

## FIRES

Fires, whether started deliberately or naturally are and were a terrifying disaster especially before the land was properly cleared and the selectors set up their dwellings, tents, bark or wood structures with no distance between the trees, the scrub and the dwelling. Remote families on small areas of land were in most danger from bushfire, the wives and the children being most vulnerable. As the land was cleared and wheat was sown the speed of the fire through the crop swept everything before it, fences, machinery and buildings. Where the eucalypts grew fire could leap over distances. Everybody in the district turned out to fight the fires no matter what their standing in the community. Family stories abound with the tales of when the fires happened and speculation about how they started.

There were other obstacles which made agriculture a difficult occupation for the farmer. Besides rabbits and rust in the wheat, there were other diseases which attacked the wheat and solutions were a long time coming. These were take-all which affected the roots of the plant and bunt, called alternatively stinking smut. Introduced weeds in the paddock lowered the value of the product and a flight of locusts could leave nothing of the crop after they had passed by.

## WOMEN ON THE FARM

In 1890, in writing about the aims of the new Department of Agriculture, the Under-Secretary, H.C.F. Anderson said that it would provide education for both the sons and daughters of farmers. Writing again in his reminiscences in 1913 he said that education for women in agriculture had not been achieved, Jane Foss in 1902 gave an address, perhaps to the Council of the Agricultural Society which was reported in the Agricultural Gazette. She spoke about the necessity for women on farms to be educated in commercial matters as they were the ones on whom it fell to make the money which went towards the viability of the farm. She was one of a group of women including Lady Windeyer and Mrs Sanger, both of whom had property interest in the Riverina. From this address it is possible to know what enterprises women made their commercial concern; bee-keeping, butter-making, cheese-making, the produce of their hens as well as the produce of their gardens. In the years before the land was cleared and the crop could be taken off these enterprises were the mainstay of their living, especially where the man was only an average or less than average farmer. These were also the stand-bys in the horse-powered machinery days, if a woman was widowed and had no sons or other male help. Some women concentrated on their dairy cows and worked the rest of the farm with a sharefarmer.

In *Below These Hills* Edward Moll gave an account of his mother's week as a farmer's wife in the early days of their wheat farm in the first decade of the 20th century after they had moved from the Wimmera in 1910. Over and above her housekeeping she made butter and, 'a good farmwoman had butter to take to town on Fridays. In Jennifer Isaacs book, *Pioneer Women of the Bush and the Outback* she used photographs and personal accounts in letters and diaries to portray the work and activities which women took on, together with their children. Cows were milked, tractors were driven to plough the paddock, the wheat was winnowed, water was carried from wells. Not all husbands were helpmates. Mary Gilmore in *Old Days, Old Ways*, wrote of the efforts to make homes and friends in the farming communities. They supported church and school and no doubt the people who initiated and expressed the dissatisfaction with the Colonial Government for not providing schools and post offices.

The hardships of the women pioneers of the 19th century was replicated by the wives of soldier settlers after World War II. In the oral history of the Wantabadgery women recorded in 1998, one said,

*We had to establish everything, there were just thousands of rabbits. The land had to be improved, we had to clear a lot of it. A lot of the timber had been ringbarked and killed but not cut down and disposed of, we had to get rid of that and burn the stumps out of the ground.*

Another recounted:

*The only improvement of our farm was really the little hut which was rather good because we had something to move into. It was pretty hot in the middle of summer and I had a little fuel stove and then we had to buy a wood copper and put it in the garage. We used to have to cart the water and fill it up and stoke it to do the washing. You would boil up your clothes. I had a glass scrubbing board to start with, a luxury... We were really short of water, we had only a 1000 gallon rainwater tank for everything.*

## EDUCATION FOR FARMERS

The establishment of the Wagga Experiment Farm as an educational facility was not the result of any ideological interest in agricultural education on the part of the government of the day: Ministerial responsibility for agriculture was forced on it as the result of political pressure applied by rural interests beyond the pastoralists.

Both Victoria and South Australia had had agricultural colleges from 1884. The New South Wales government was being made aware of the fact that it was lagging behind these two states in wheat production. The State was, indeed, importing wheat from the other two states. Agriculture in New South Wales was in the doldrums, maintained by outmoded practices, crops and land use. Although new machinery, marketing and fertilisers had been introduced; adequate means of communicating knowledge had not been put to work to introduce farmers to the new crops and methods. In fact, the lack of will to redress the situation was evident in the lament of New South Wales Agricultural Society Council in 1872, that there was little prospect of doing anything for agriculture in the shape of technical education.

Selectors' Associations and Farmers' Unions began to exercise pressure for scientific agriculture to be promoted. The settlers with few financial resources had eagerly taken up land under the Land Acts beginning in 1861, and were able to support themselves and their families working on the stations with very little application to farming. By the end of 1886 it was estimated that the work of fencing, building and other improvements for the pastoralists, like tank sinking was complete. The settlers now found that their main source of income would have to be farming about which they knew little. The cultivation of wheat which had begun in the first days of settlement in the Sydney Basin, was always plagued with rust. Wheat planting was moved to the highlands and at last found its most suitable climate and soil on the western slopes. But even in the most favourable places the crops were subject to the various diseases of wheat and in addition farmers could not maintain continuous cropping and production.

Newspapers, too, pushed for education in agriculture spurred by the ignorance of farmers about their being able to maintain profitable farming practices, but as Alan Barcan in his book, *Education in Australia*, said:

*In South Australia and Victoria a successful rural middle-class of farmers existed but in New South Wales the pastoral supremacy was stronger. This helps to explain the lack of enthusiasm for agricultural colleges in the Mother State.*

There had been an earlier move in New South Wales towards agricultural education when the Board of Technical Education started classes in 1885. Alexander Kethul, a timber merchant, wanted a more geographically widespread approach and so he put up a motion in Parliament for the establishment of an agricultural college. The government was lethargic, but it did decide to make some investigations of the needs and possibilities. The Minister invited Robert Pudney from Longeranong Agricultural College in Victoria to advise on the best method of establishing agricultural colleges and schools.

The following year, 1886, W. S. Campbell, who was attached to the Department of Mines, began a survey to report on suitable sites for experimental and demonstration farms in various parts of the colony. He submitted his report in 1888, but then relating only to the Clarence and Richmond River districts. He was later to examine the Inverell, Monaro, and Orange districts. Sydney Smith, who became Minister for Mines and Agriculture in 1889, received the report and in 1890 in the very first Agricultural Gazette wrote about the aims of the new directions:

*In connection with each experimental and regional farm there will be a Farm School. Here the students will study on alternate days such subjects of general education as reading, arithmetic, mensuration, principles of agriculture, elements of chemistry, geometry, natural history and farm bookkeeping. On other days they will be engaged on practical work on the Farm, learning all the operations of mixed farming, fruit growing and dairying with the minor industries of bee-keeping, floriculture, and any other peculiar to the district.*

*The cost of such education will be as reasonable as possible and naturally the system of bursaries will be extended to that class of schools--the most deserving students whose circumstances demand the concession of being educated at the cost of the State. The aims of the department are to help those now on the soil to educate their sons and daughters who will succeed them.*

The new Department of Mines and Agriculture began in 1890 and under its first Director, H. C. Anderson, it was determined that there should be a central agricultural college together with Model Farms. Hawkesbury Agricultural College was established in 1891 and as many as 20 sites for model farms were inspected around the State which, it was thought, would suit that particular district. Hawkesbury was to be the central educational institution, connected with a small number of experiment farms.

In the first annual report on agriculture of 1890 the aims were set out more expansively and with perhaps more ambitious objectives. It was to be a system of education from Primary Schools up to the University and devoted solely to the study of the practice and the science of agriculture. At this point it was coming into conflict with the Department of Education which maintained that agriculture would be better partnered with it, rather than the Department of Mines. Later, in 1913, the then Minister for Education set up a commission to investigate Agricultural Education. It was proposed that the first experiment farm in the state was to be the Murrumbidgee Experimental Farm. This was the name by which it was known by John Coleman, but it was soon changed to the Wagga Experimental Farm.

There were in the which would help to ensure a continuing interest in the success of the venture Riverina interests. In 1890, a new combination of interested farmers had come into being which would develop into a politically active body. This was the Farmers' Union which had its first meeting in the Wagga Wagga Town Hall. In time it would become the Farmers and Settlers Association with its president and secretary coming from Mundrawaddera near Henty and it would take a lively interest in the Wagga Experiment Farm.

Wagga Wagga was considered at that time to be the gateway to the Riverina. It was from here that the shearing gangs moved out to the big sheds. Politically, it was the centre of radicalism. Under the then electoral system the Murrumbidgee electorate could return ten members to Parliament. In the election of that year only one squatter was returned; the rest were made up of a merchant, a solicitor, a flour miller, four selectors representatives and two Labour Electoral League men. The new concept of the Model Farm with new crops and expert personnel should have found a ready acceptance, but it seems that it was the more progressive farmers who took the opportunities which it offered for information. This was

evidenced by the reports in the newspaper of the day in the towns around about.



## WAGGA EXPERIMENTAL FARM

The site of the Farm, on Crown land in the Parish of North Wagga, including part of the North Wagga Common, had been decided on at the end of 1891, but legalities took until late in 1892 to complete. It was dedicated at last in October of that year. The reporter in The Burrangong Chronicle in 1896 would write that the land in its natural state was no better, if as good as the majority of the neighbouring districts, and in the days of selection, had been passed over.

The address of the Farm was Bomen for many years. When the site was selected, the Hampden Bridge had not been built and the town of Wagga Wagga was reached by a low-level toll bridge about 100 metres from what is now the new Wiradjuri Bridge. An alternative to this if you had no money, was to use the ford across the river further downstream opposite the Black Swan Hotel.

The Farm covered 2 000 acres and the most prominent features of the landscape were the Two Sisters Hills. The boundary on the southern side continued in a line from what is today the eastern access to the winery, across the hill to the Pine Gully Road. The eastern boundary was the travelling stock reserve on the then non-existent Coolamon Road. A. C. Benson, the fruit expert, was to complain later that the persistent weed problem in the orchard came from it having been a sheep and cattle camp.

It was a virgin site. There were no buildings, no fences, no water. John Coleman had been appointed first Superintendent in January 1892, solely to initiate the project, which was to be the model for the establishment of other Farms. He began work by having the eastern side of the hill cleared. This was done with difficulty as it was all green timber and none had been ringbarked. The original trees on the Two Sisters were hill red gum (*Eucalyptus dealbata*), white box (*Eucalyptus albens*), and black pine (*Callistris endlicheri*). At the western end of the Farm, along Houlaghans Creek there was a different stand of timber: white pine (*Callistris columellari*), yellow box (*Eucalyptus mellidora*) and black box (*eucalyptus largiflorens*).

When the first clearing was done, 75 acres on the eastern side of the hills was to be for the orchard and 10 acres for Dr Nathan Cobb's experimental use. The first dam on the Farm was constructed on

the little creek which flows between what is now the TAFE campus and the land which is Booranga Estate. Later, on what Coleman described as the farm proper, land was to be cleared for trial crops of grain. Where the tennis courts are now laid out, a tank was excavated to catch any run off.

Various kinds of experimental work in wheat, oats, barley, and vegetables were begun by John Coleman and Nathan Cobb in 1893. The vegetable growing and trials were of great importance at the time, as, outside a few stations and farms, vegetables were not grown and scurvy was a persistent problem. Vegetables such as melons, peas, potatoes and turnips were trialed for their suitability in the soil and climate so that they had the possibility of being a quick answer to the needs of the farming community. Fruit trees were a longer-term project for any farmer as well as for the Farm.

It appears from the Dhulura diary, now in the Charles Sturt University Regional Archives, that John Coleman, his wife and daughter were living comfortably at 'Estella' about two or three kilometres to the south of the Farm. There is mention in the diary of John Coleman taking Nathan Cobb to visit the Booths, owners of the property, and of Coleman's wife and daughter driving over quite regularly to visit. He was to advise them on their choice of fruit trees and layout for their orchard, taking them to Boswell's nursery in Wagga Wagga to make the purchase.

George Valder and A.C. Benson arrived in June 1894 to set up the orchard. Valder had been appointed experimentalist and manager of the orchard working with orchard and vegetable varieties. He was regarded as an expert in seeds, while Benson was the fruit expert. Coleman was still superintendent and the term, 'manager' as the overall governor of the Farm only came into use after Coleman went to Bathurst and Valder assumed the role. Coleman left the Farm in October of that year and moved to Bathurst where he was to initiate the Bathurst Experiment Farm operating out a property called 'Logan Brae'.

Although enough clearing had been done to begin the operations for which the Farm was established, it was George Valder who was the builder and in whose time the first students were able to come into residence.

George Valder was born in England in 1861. There he had received a theoretical and practical training in agriculture and had been employed on farms in Hampshire, Kent and Surrey. He came to Australia,

arriving in Sydney in January, 1884. He expanded his experience by working on farms and for nurserymen. At the same time, he began studying Australian agriculture at the Sydney Technical College. He joined the Department of Agriculture and Mines in March, 1890. At the end of the year examinations, he became Dux of the Technical College and he was awarded the first Associateship of the College for meritorious pass- A.S.T.C. In his course he had done theoretical and practical agriculture; theoretical and practical chemistry; botany, geology, wool-sorting etc .He was became one of the young, early recruits to the new Department after it was set up in 1890, being mentioned in the Botanist's report in 1891, as being in charge of the Seeds Book and later the Seeds Room.

Even though George Valder had been in Australia for six years it must have been a culture shock to come to Wagga Wagga. Valder said later that he wondered at first what the Department was doing when it sent him and A. C. Benson there. The plant available to them for work was a team of 11 yoked oxen, two draught horses and a farm dray besides a plough and a harrow. When it rained they slept under trees and when they wanted water they sent down to old Mr Matthews who had an adjoining forty acre block on the travelling stock route. They moved to a cowshed, but the cows got under it too. When he asked the Department to build him a fence, they allowed him £14, provided he sold firewood to cover the amount. As the orchard was being laid out the first building was begun. It was a large shed which was to be used as a seed room but it was also used by Valder to live and work in when he actually took over from John Coleman. The other building was a stable which Valder and Benson had to put up for themselves.

There was as yet no accommodation for students. In Benson's report on the orchard he outlined the role the students would take in the new enterprise.

*The students will have to be workers and they will get a thorough insight into the working of the orchard and vineyard, including cultivation, pruning, propagating, spraying, thinning, gathering, grading, and packing fruit, as well as fruit for drying, raisin making, prune making.*

Pressure was now being exercised to provide accommodation for students. The Wagga Wagga Advertiser in 1894 began the push. This resulted in James Gorily, a local Member of Parliament, being able to announce that the Government architect *'had been requested to have plans and specifications drawn up so that building may be erected to accommodate resident officers and workmen as well as resident students.'*

In the two years between 1894, when Valder became manager and 1896 there was a flurry of building activity. Among the first new buildings was accommodation for the manager on the slope above the orchard and the weatherboard building for Dr Cobb's use as laboratory and accommodation? In March 1896, The Wagga Wagga Express published a report on the Wagga Experimental Farm and described what progress had been made. The permanent house for Valder had still to be completed as were other buildings for the farm, 'using colonial pine with iron roofing and nothing but local wood'. Stables for 24 horses were in the course of construction. The stables formed part of a quadrangle, which included a chaff room, implement shed, quarters for sixteen apprentices', with 'all necessary accommodation'. The dormitories for the 'apprentices' faced west, providing accommodation as well for the officer in charge. A cook's room is on one end and all completed with six-foot wide verandahs. A temporary barn would be converted later on into lecture and recreation rooms. These quarters may have been the long building used for the luncheon for the Minister for Agriculture when he visited in April.

In April of 1896 the Minister had come to see the progress of the new buildings and students quarters. In fact, these partly completed buildings were used to show farmers the kinds of building construction and materials which could be used on farms, " in every way serviceable and at the same time economical". The Wagga Wagga Advertiser was not overly impressed by what was there nor by the slowness of the undertaking. It commented:

*It is to be admitted that the Farm will not realise its full potential until it is in a position to become a teaching institution. It is not to be expected that the young men sent to the Farm to study...should be treated with undue indulgence...but there is no reason why their lives should be made more uncomfortable than their own homes.*

The paper further said, *'the unpretentious character of the new buildings at the Farm... is plain to the point of ugliness'*.

In his report of 1896-7 Valder outlined what had been done. The house for the manager and Dr Cobb's weatherboard laboratory and accommodation were complete but students quarters were only finished enough to take the first nine students who were enrolled on the 1st October 1896 and the College (as it was known from the beginning) was officially opened on the 2nd October. The intention was to have the accommodation complete so as to take the full complement of 16 students. At the opening there were only six students enrolled. However, perhaps to their surprise, by the end of the year requests for admission were beyond that expectation and another eight students were accepted. The following year 27 students were in residence with many more applications being refused.

George Valder left Wagga Experiment Farm to become the Principal of Hawkesbury Agricultural College; to represent the State in South Africa; become Chief Inspector of the Department of Agriculture and later the Director of the Department.

## HERITAGE SITES

On the campus of the Charles Sturt University are buildings which date back to the establishment of the Wagga Experiment Farm. On the eastern side of the Two Sisters, one of the original orchard sheds is still to be seen, on the site of the Winery. It is built of pine cleared from the original site.

Opposite, above the Booranga Estate vineyard are the remains of two buildings erected in 1896-7, the granary and the laboratory. A journalist described the original buildings after visiting the Farm. The Wagga Advertiser journalist, in October 1897, reported on a visit to the Farm to see what progress had been made. He reported in detail the interview and inspection tour he had with Dr Cobb. Cobb's first laboratory had been a tent, then a 'fairly large weatherboard building with the tent still beside it'. The journalist in the course of his article contrasted this building with the new laboratory, 'situated right in the middle of the experimental plots, instead of, as in the case of the present one, at a distance of over half a mile.' At the time of the journalist's visit, the new brick building had been built on the eastern side of the hill. It was the first proper laboratory built by the Department and designed for specific investigative and teaching purposes. The journalist's wrote,

*The building is of two storeys and is in the form of a cube, this being the shape which least exposes it either to the cold of winter or the heat of summer. It is substantially constructed of brick and round each storey is a wide verandah or balcony. It was to be labour saving for the scientific staff and as 'perfect as human ingenuity could make.*

The description of the building was fuller in the newspaper than in Cobb's own description:

*Each of the two floors contains 4 large and well-ventilated rooms, the access of which is from the outside of the building but, believing that it may be necessary to provide for direct communication from room to room, the walls have been constructed in such a way as to allow of this being affected at small expense. Each room has been specially laid out for its intended purpose. Thus the room occupied by Dr Cobb has in it steel railway rails set in solid cement in order that the microscopes and other apparatus may be placed upon them in such a way as to provide against vibration. The photographic developing room has also been built*

*with all possible convenience for the carrying out of the art and other rooms are equally adapted to their utilitarian objects. Under the building is a cellar with solidly cemented floor, into which runs a 80ft shaft or tunnel to convey fresh air which is to be distributed all over the building. The top of the building is flat with a high brick rail and cemented floor. As an awning will stretch over the roof, upon its solid and crackles floor may be conducted the many operations of sorting and sifting grain...Each of the upper landings has a sliding panel in the rail so that goods may be easily hoisted from the ground. Each of the two floors contains 4 large and well-ventilated rooms, the access of which is from the outside of the building but, believing that it may be necessary to provide for direct communication from room to room, the walls have been constructed in such a way as to allow of this being affected at small expense. Each room has been specially laid out for its intended purpose. Thus the room occupied by Dr Cobb has in it steel railway rails set in solid cement in order that the microscopes and other apparatus may be placed upon them in such as way as to provide against vibration. The photographic developing room has also been built with all possible convenience for the carrying out of the art and other rooms are equally adapted to their utilitarian objects. Under the building is a cellar with solidly cemented floor, into which runs a 80ft shaft or tunnel to convey fresh air which is to be distributed all over the building. The top of the building is flat with a high brick rail and cemented floor. As an awning will stretch over the roof, upon its solid and crackless floor may be conducted the many operations of sorting and sifting grain...Each of the upper landings has a sliding panel in the rail so that goods may be easily hoisted from the ground.*

The granary, or elevator, as Cobb called it, or 'Cobb's Folly' as others called it, was close by. It excited the journalist to be ecstatic over the extensive views right to Mount Kosciusko. After this, he gave a close description of the structure.

*The situation is below and to the right of the new laboratory and the building is upon the most modern lines. The granary is of three floors and for purposes of inspection, as for use, one can best commence at the top. The site of the building has been cut away from the hillside, and on the hill at a level with the top storey will run a roadway. Across the intervening space will be placed a bridge and over this bridge will be driven the carts containing the grain. The grain then be released from the carts will fall upon the floor. Along the floor at regular intervals are trapdoors leading to bins of the shape of an inverted triangle. The bins open with a small slide into the chamber beneath. On this floor (which*

*also communicates with the roadway in case the upper floor is full) there is a large high table upon rollers, which can be rolled beneath each bin as is required. The operator will have upon the table a sifting machine to separate and cleanse the grain. Beneath this on the floor will be a similar machine and the grain when cleaned can be bagged or allowed to drop through other bins (at which, if necessary the cleansing process can be repeated) to the bottom. At the sides of the floor are openings through which the dirt and rubbish may be swept...The building is of the most solid character, and here, as at the laboratory, all possible care has been taken to provide for the saving of labour and to add to the convenience of the work. The principle upon which the building is erected is the elevator process...Except for the primary work of carting the grain all the cleaning will be conducted on the principle of making the grain by its own weight become its own carrier and distributor.*

On the same side of the road and overlooking the winery, is the first house built for George Valder when he became the manager of the Farm. It is now the Writers Centre. The structure has been altered. Originally there were French windows opening onto the front verandah and the back of the house has lost its open 'patio'.

On the main agriculture campus are two accommodation blocks. The West Wing was completed in 1908, the East Wing was completed in 1911. The Convention Centre occupies the position of a two-storey accommodation block which made the third side of the site and built in 1902.

The building of the School of Agriculture encompasses the old dairy building erected in about 1913, and made of ashlar. The outer structure has not been altered but the entire has been modified for office space.

Besides the buildings there are two Eucalypt citriodora trees behind the Graham Building which were planted in the time of the second Manager, Maurice McKeown before World War I.

Outside the University, the barn at 'Estella' is still there and is occupied by 'The Magpie's Nest' restaurant. The house is part of City Council's properties.



## FLOUR MILLS

The first flourmill in Sydney is recorded as being erected by Nicholas Lucas, a convict transported to Botany Bay and then to Norfolk Island, where he built a mill. Governor King recalled him to Sydney and commissioned him to build a mill on Church Hill, powered by wind. The millstones were brought from Norfolk Island. Lucas then went on to build other mills in the Colony.

An old mill at Aberdeen, near Newcastle, has been found with the building dating from 1825. It was built by convicts of rough random coursed stone and was to be a horse driven mill. In 1840 a single cylinder steam engine was installed and a brick chimney and a bakery were added. A horizontal shaft with two bevel gear wheels attached for the driving the vertical shaft round which the millstones were fitted. Grooves were chipped onto the flat face of the stone in a special pattern, using a tool made for the purpose. It appears that the remains of the sifting apparatus was lying along the wall where it had been detached from the rest of the machinery. The remains give a clue about what the colonial mills workings were.

At about the same time, the emancipist entrepreneur Simeon Lord set up a flourmill at Botany Bay and until the middle of the 19th century mills depended on millstones. The mill was equipped with a pair of millstones; the fixed nether (lower) stone and the rotating upper millstone. The wheat was fed into the branched radial grooves which would deliver the wheat into the periphery for the grinding process. The best stones were French buhr stones, cut to match so that the edges of the grooves acted a scissors on the grain. The resulting meal was separated into flour, middlings and bran. The bran was discarded from the flour process and the other was out sieved through wool or silk. The millstones were driven by a water race, wind or steam, or as in the mill at Aberdeen by horse.

There were three main steps in the stone milling process: the cleaning and preparation of the grain, grinding and bolting (sieving the flour through cloth to remove the coarser particles of bran). Grinding raised the temperature of the meal which could alter the colour of the flour and make the wheatgerm oil become rancid. To achieve good flour colour the distances between the upper and the nether millstones needed to be adjusted. The millstones used by the middle of the 19th century were carefully matched and balanced to perfection. For those millers continuing to use millstones, a purifier had been developed which

mechanically winnowed and sifted simultaneously. This was the last refinement of stone milling process of centuries.

One of the problems of the stone milling process was that they could only grind soft wheat and in Australia the reluctance of the millers to alter their technology slowed up the acceptance of hard wheat for flour.

In Europe, a new technology for milling was developed. In Switzerland in 1830 a man named Muller built a mill to accommodate rollers and called on Jacob Salzberger to make the modifications. Salzberger installed a mill at Pest in Hungary.

From that time progress was made and by 1860 Hungarians had evolved a system of milling using steel or chilled iron to produce fine flour. In Italy Freidrich Wegman introduced porcelain rollers. By 1878 it was recognised that rollers were more economical and more consistent than the old stone mills.

It has been said that up to the 1880s milling in Australia remained at a farmhouse or village level. The amount of wheat which was grown by small farmers was often only for local consumption. The household might have a steel handmill or a local, like Robert Nixon at Gregadoo, could build his own small mill on his property powered by a water race and have an operation no different from the village miller in medieval times. Nixon later built a commercially functioning mill on a block between what is now Westpac and the lagoon and accessed from what was then the Tarcutta Road.

There are apparently the remains of a similar small mill on Tarcutta Creek at Oberne. There must be the remains of others near Tumut. There is still standing the shell of a commercial mill at Gundagai.

In Albury the Town and Country Journal reported in 1872 was taken for a walk round the town and saw:

*...a huge busy puffing flourmill built of granite, three stories high, filled with wheat in every available part, bullock drays, horse teams and carts, were before the entrances. Messrs Hayes Bros whose flour mills at Goulburn, Yass and other towns in New South Wales are well- known. In Albury they, for a considerable time, have had the mill at work night and*

*day... Below Hayes Mill is a smaller mill at work, carried out Mr Burrows.*

*Burrows Mill grew from its small beginnings and the mill has continued under other names to the present time.*

In the days when it was seen as good business to start a mill, and at one time there were three in Wagga Wagga, the farmers began to feel that they were being short-changed in the operation, and inspired by the Co-operative dairy movement decided to apply the same approach to milling and in Wagga Wagga in 1889 began a co-operative. It was not a success because needing capital the farmers were forced to allow non-producers to buy shares and so it lost in due course its benefit to farmers.

Roller mills had been introduced into Australia at the Union Mill at Gawler in South Australia in 1879, with twenty-seven pairs of stone and twelve sets of porcelain rollers. In Sydney roller milling systems were displayed at the Sydney International Exhibition and the first Ganz rollers in NSW were installed in a mill at Goulburn. (now a bespoke brewery).

In the 1880s commercial mills were established in growing towns in the Riverina alongside the railways; at Cootamundra, Junee, Wagga Wagga, Coolamon, Narrandera, Temora and Albury, powered by steam. At this time the flourmills stood out as the tallest buildings in town. Studying the locations of mill towns on the map, it would seem that the most numerous were north of the Murrumbidgee and become a key to the extent of wheat production after the 1880s. In the Southern Riverina there was still a considerable concentration of livestock, particularly sheep, in what remained a relatively well-watered district. North of the Murrumbidgee and away from the river flats, and into the less well watered country, but better grain growing soil, wheat was a better proposition.

It was the introduction of the roller mills which William Farrer, the wheat breeder, and F.B.Guthrie, the Department of Agriculture chemist, could combine the cereal chemistry and the crossbreeding of wheat varieties that revived the wheat industry in Australia.

## RESOURCES

### Pictorial Material

1. The Riverina Archives photographs:  
Wagga Experiment Farm  
Wheat Research Institute
2. Photographs in the hands of Riverina Historical Societies
3. National Library Pictorial Collection:  
Strangmen Collection; a postcard of a wheat field at Tumut

### Kerry Photographs:

A rapidly growing industry-sheaves of wheat going to the thresher  
Stripper harvesting wheat at Canning Downs near Warwick 1894  
[a good illustration of the process]

Wheat stacks at a country railway station

Strippers in a field at Coolamon 1912. Headed: value of  
agricultural production in New South Wales in 1912.

Agriculture, Wheat harvesting 1913: donated by Kevin White.

Note on the photo, 'This mound is wheat and chaff. It has to be put  
through the winnow. The heads are stripped from the crop and  
the standing straw burnt after. I am the one of the bag sewers here.  
See how we stacked. 1911-1913.

Harvesting at Iandra, reproduced from Australia unlimited. Photo  
by Brady 169

A Sharefarmers home- the wheat country. Album 48 p63

A farm Homestead; the Tyrell Collection

Ploughing match. A Kerry photograph 132 from the Kean Burke  
collection

Ploughing North Yanco [with a three-wheeled plough]. Album 63  
reclaiming the mallee: Illustrated Australian News; 1st January  
1892; p12.

Gippsland 1886; John Fowler compound engine with plough.

The Barton's Plant, tank-sinking near Bourke.

Ploughing Match 1875: Illustrated Sydney News.

Disc Ploughing with a traction engine; Tamworth District NSW.  
Album 779. Rural New South Wales Australia, done for  
immigration information: 'Magnificent opening for farmers.

Drilling and harrowing; Illustrated London News 7/11/1846

Wheat silo at Oaklands 1959 with bagged wheat as well.

S.T. Gill: 'The Months': watercolour

## Mills

### Albury Mills

Albury Flour Mill formerly Burrows alongside the railway line.

Photograph, W .A. Bayley.

The Old Mill at Morley's Creek, sole survivor from the great flood of 1852 [Gundagai].

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<sup>1</sup> Up to the change to metric measurement, statistical terms for area were given as acres. Metric measurement is 2.47 acres =1 hectare