100 YEARS OF WHEAT GROWING IN SOUTH AUSTRALIA

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By the year 1858 wheat growing had become well established in South Australia. The settlement around Adelaide had been founded to test the land settlement ideas of Edward Gibbon Wakefield. The region in the vicinity was the only large area of good wheat growing soil near the seaboard, from which a low value crop like wheat could be handled economically. Settlement had spread rapidly because of the favourable climatic conditions and the ease of clearing the Adelaide plains.

The first real problem was to obtain the labour to handle the crop. Wheat was cheap but labour was relatively dear and scarce. The limit to expansion was the capacity to harvest the acreage planted. A Wheat Marketing Committee had offered a prize in 1843 for the best model or plans for a mechanical means of harvesting grain. Although the model that won this competition never became a commercial proposition, the competition stimulated interest and at the end of that year, John Ridley had successfully tried the first stripper.

This removed the first limiting factor to production and by 1858 wheat sowings had expanded to 188,703 acres. This area produced that year just over 2 million bushels at an average yield of 11 bushels 11 lbs. per acre.

In passing, it is interesting to note that in 1858, 14,526 acres had been sown to barley and yielded a crop of 239,318 bushels (16½ bushels per acre) and 3,934 acres were sown to oats for a yield of 76,336 bushels (20½ bushels per acre).

Just prior to this period, although harvesting had become easier, the problem of selling wheat had limited expansion. Until 1846, there was a tax of 7½d. per bushel on wheat imported into England, at a time when wheat was worth little more than 3/0d. per bushel. When the English Corn Laws were repealed this tariff loading was removed and the way was open for increased wheat production and sales at remunerative prices.

One of the disease problems of wheat, bunt, had been controlled in South Australia by John Reynell by using copper sulphate pickling as early as 1843. So that, even at this early stage in the history

of wheat growing in Australia, two outstanding South Australian contributions had been made - Ridley's stripper and Reynell's bluestone treatment for bunt.

The century under review opened in this atmosphere - one which presaged a rapid expansion of cereal growing on the fertile soils of South Australia's hinterland.

The Gold Rushes of the 1850's reduced the rate of expansion considerably, by drawing off labour as well as curtailing interest in land development. Even so, by about 1867 most of the readily cleared better soil areas had been taken up and it was in that year that 3 million acres of mallee scrub were opened for selection.

Clearing the mallee was an entirely new problem. It was a challenge to the ingenuity of the enthusiastic settlers. Two inventions soon gave the key to clearing and development of mallee-covered areas for wheat production. About 1874 a settler named Mullens developed the idea of rolling the mallee, firing the residues the following year, and seeding the wheat on the burnt residues. This Mullenising process, as it became known, still left the stumps of the mallee as major hindrances to further cultivation.

This undoubtedly led to the invention of the Stump-jump Plow by R. B. Smith in 1876. These inventions made it possible for large areas of country to be cultivated for cereal growing.

Wheat continued to be the dominant crop and could well be described as the great pioneer of South Australian agriculture.

It is not generally realised that South Australia led Australia for a long period in wheat production. In 1860 Australia had only 645,000 acres under wheat, of which South Australia contributed no less than 274,000 acres. In 1890, just over 3,000,000 acres were seeded in Australia and 1,700,000 acres - over half - were grown in South Australia.

Reference to the graphs will indicate that during this first period of wheat expansion there was an insidious but unmistakable decline in the average yield per acre.

Three outstanding developments occurred in the 1880's. Hugh Victor McKay demonstrated the first harvester, incorporating the principle of the Ridley stripper and the winnower in the one machine.

Professor Custance, the first Principal of Roseworthy Agricultural College, successfully demonstrated a marked response to the use of superphosphate on cereals grown at the College and he and his successor, Professor Lowrie, were convinced that dressings of one to three cwts. of superphosphate per acre could lead to substantial increases in yield. Professor Lowrie also very successfully advocated fallowing as a means of preparation for the wheat crop.

These factors were not to influence wheat growing in South Australia until the 1890's. Although Custance had advocated the use of superphosphate as early as 1881 and Lowrie had carried out a strenuous campaign for its adoption throughout the country, it was not until 1892 that superphosphate was first commercially used and drilled in with the seed as a standard operation by Messrs. Custance, Parsons and Correll Brothers of Minlaton, Yorke Peninsula.

The fallowing methods advocated by Lowrie were more readily adopted because they offered a great convenience - they spread the work of soil preparation more evenly over the year and assured reasonable seed bed conditions when the rains were received in the autumn and before conditions were too wet for the horse power of the times to cope with ploughing and cultivating as well as seeding.

Although McKay had demonstrated his first harvester in 1885, he too had found considerable difficulty in having his invention adopted and it was not until 1894, when he began building harvesters himself in a lean-to shed, that this revolutionary change in harvesting was to really begin.

In 1894 one of the first big improvements in varieties was made by a South Australian, H. G. Gluyas of Port Germein. He selected the variety Early Gluyas, from a field of Ward's Prolific. This variety proved to be one of the most successful ever grown in South Australia and continued to be a leading variety until the late 1930's.

This selection by Gluyas was a prelude to the more purposeful efforts which were currently being made by William Farrer in New South Wales. The effects of Farrer's work became a dominating factor in Australian wheat growing with the release of his variety, Federation, in 1901.

This marks the end of the first phase in South Australian wheat growing.

The change from the 1890's onwards was dramatic, particularly with respect to the recovery in yield per acre. Three factors were operating. The most significant was the universal application of superphosphate. This, coupled with varieties more suited to the environment and fallowing methods, pushed average yields upwards and ushered in a period which we can now, in our wisdom, look back upon and call the period of soil exploitation.

It was not that our agriculturalists failed to recognise the importance of soil fertility but rather, that certain misconceptions led to excessive cultivation and a lack of appreciation of the damage being done to the soil and of the need to replenish soil nutrients.

In 1911 a Dry Farming Conference was held in South Australia to explore the desirability of applying American dry farming methods to Australian conditions. These methods were based on two principles - both of which were subsequently proved to be wrong - one, that a dry mulch surface was necessary to prevent loss of moisture and, two, that deep tillage was essential for the intake and retention of maximum quantities of moisture.

At this conference Professor Lowrie, who was then Director of Agriculture in South Australia, drew attention to the fact that fallowing did more than increase the supply of moisture because fallowed land gave better results than unfallowed land, even in a year when the rainfall was more than sufficient. He made the significant statement that "we should study therefore the question of nitrogen and its fixation in relation to fallowing."

This interstate conference on dry farming really ushered in a period of scientific searching for the answers to the problems of fallowing. It also drew attention to the need for greater knowledge with respect to the effect of tillage on soil structure and productivity generally.

By this time, wheat growing was increasing in importance so that during World War I and the post-war period the expansion was very greatly accelerated by world demand.

Post-World War I land settlement was optimistically based on expansion of wheat growing. As a result of experiences obtained during World War I with tanks, tractor power became a force which by 1924 had begun to replace horses.

The 1930/31 season represented the zenith of wheat growing in South Australia and up until then prices had been satisfactory and farmers and Governments were optimistic. All eyes were on the extension of the wheat belt further and further out into the drier areas where soil conditions were good.

From the 1890's to a peak in 1930, wheat growing had expanded continuously and acreages had increased from about 1½ million acres in 1890 to the maximum of over 4 million acres in 1930. It was then that the combined effects of depression and drought set wheat growing back. The need for retreat from the marginal areas was evident and led to a gradual recession based on the need to reduce cultivation generally.

In 1933 the Commonwealth Government brought down the Wheatgrowers Relief Act as an emergency measure and in 1934 set up a Royal Commission on the wheat, flour and bread industries. The outcome was a general conference of all interested in wheat growing in 1935 and the first adoption of the principle of home consumption prices through the flour tax. This subsequently led to the Wheat Industry Assistance Act in which the emergency flour tax was continued as a prominent feature of the first stabilisation plan to operate in Australia.

Since then, of course, stabilisation has been a feature of the Australian wheat industry and was a very necessary safeguard to wheat growing prior to World War II. During and since the war, prices for wheat recovered and the wheat grower ceased to become a liability to the general taxpayer. The scheme which operated in later years, since 1948 in particular, was never called upon to support prices received by wheat growers. For some years indeed, the reverse was true and Australian wheat growers subsidised consumers.

This year sees the end of another five year period of stabilisation and a new scheme is under consideration. During the last stages of the present scheme, overseas prices have closely approached nearer than they have been to cost of production figures and the Wheat Industry Stabilisation Scheme again looms as a safeguard which the wheat growers should regard with favour.

Attention is drawn to the important decision taken in 1932 which set a new policy of breeding wheats of better baking quality at Roseworthy College and the Waite Agricultural Research Institute. From then on crossbred wheats which did not measure up to a certain minimum standard of quality were discarded. This was done to protect the good name of f.a.q. wheat which was then being criticised by overseas buyers because of its generally low quality. Free Gallipoli at the time was the variety dominating the wheat being exported. The new policy also aimed at meeting future demands for high quality wheat.

The result of this policy led to the striking advance in the quality of South Australian wheat varieties. It found its culmination in 1953 when the State Wheat Championship Crop Competition and the Best Quality Crop Competition were both won by Mr. D. W. Stone of Saddleworth with the variety Dirk. Thus it was demonstrated that yield and quality had been really successfully combined in one variety. Dirk and other high yielding quality varieties had been bred by E. J. Breakwell of Roseworthy College.

Since World War II far-reaching and significant changes have occurred in South Australian wheat growing. Not only has the pattern of cereal growing changed to the extent that barley rivals wheat as the leading crop but purely arable farming has given way to a balance between livestock and cropping. These changes are the result of:

1. Insistent and persistent advocacy by the Department of Agriculture of the need for soil conservation, reduction in tillage, and the widening of crop rotations by using leguminous pastures and putting livestock on the farm.
2. The economic circumstances of exceptionally high relative prices after the war for wool and other animal produce, compared with wheat. These circumstances created the urge to change the land-use pattern on practically all cereal farms.

   The relatively high prices for barley compared with wheat, as well as the advantages barley has over wheat as an associate-crop with sheep farming, has in like manner led to greater emphasis on barley.

From the national as well as the purely agricultural viewpoint the changes have given extreme satisfaction. They have proved the long standing advice of the Department to be right, because today we are growing more wheat on half the acres that were required in the heyday of the period of soil exploitation - the early 1930's. From the 1930's onwards we have passed through a period of steady change which served to check exploitation and prepare the way for greater soil conservation. Since the war these changes have been accelerated as a result of favourable price incentives and we have entered the era of balanced agriculture. The results have been so satisfying to the farmers themselves that this change to balanced agriculture has been complete and is unlikely to change, so that stability has come to our agricultural areas for the first time since the days of early expansion.

This story is not complete without taking into consideration three exceptionally important forward steps recently taken with regard to the wheat industry in this State.

1. A most important and forward step was made this year by the Australian Wheat Board in South Australia, by separating at receival points wheat of hard and medium hard varieties from the soft wheat varieties of low baking quality.

   In 1888 South Australia took the lead and established what was then called a standard sample method for marketing wheat. This became known as the fair average quality system (the f.a.q. for short), and until this year persisted as the only way in which wheat was marketed.

2. Another important change has been the establishment of bulk handling in South Australia which is making rapid progress at the moment.

   It is especially significant that S. A. Co-operative Bulk Handling Ltd. is building such up-to-date vertical silos which should meet the foreseeable needs for separation of wheat into appropriate marketing classes.

3. The establishment of a Wheat Research Council and State Wheat Industry Research Committees, following the imposition of a special levy of ½d. per bushel has this year revitalised

research into wheat industry problems. The industry is to be congratulated on making this possible and there is no doubt that the impact of these new sources of finance on the research and advisory services will contribute tremendously to the future efficiency and wellbeing of the Australian wheat industry.