

THE SOUTH AUSTRALIAN DEPARTMENT OF AGRICULTURE AND ITS WORK

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AS IN OTHER AUSTRALIAN STATES, the two main functions of the Department of Agriculture are advice and protection. It advises the Government and the rural community on all matters affecting rural production. It protects the industries concerned from the inroads of pests and diseases and guards farmers against exploitation.

The fact that Departments of Agriculture have to administer these protective services, and at the same time retain the respect and confidence of producers, calls for a rare combination of tact, training and appreciation of the social and psychological implications of the work. For any organization to take police action against a farmer one day and act as the same man's adviser and friend the next, calls for skill and a sound understanding of human relationships.

Science Services

The South Australian Department differs from other Departments in Australia in that the science services, necessary as the adjuncts to both the advisory and regulatory functions, are not carried out by the Department itself. Services in plant pathology and entomology, and to a lesser extent systematic botany, are vested in the Waite Agricultural Research Institute. The Institute of Medical and Veterinary Science performs laboratory diagnosis of animal diseases. In addition, the State Department of Chemistry attends to all routine chemical analyses as well as cereal chemistry. In every instance, there is a very satisfactory relationship between the Department of Agriculture and the organization concerned, both at the administrative and individual levels.

South Australia's Agricultural College at Roseworthy is an independent Department, under the Minister of Agriculture, and not administered by the Department of

Agriculture as is the case in most other States. On the other hand, a close liaison exists between the work of the Department and the plant and animal work of the College.

Soil Conservation

From the point of view of organization, also, the South Australian Department has certain features which differ from those applying in most other States. Soil Conservation is considered to be based on sound land use and therefore essentially a function of the Department of Agriculture. Soil Conservation work is the responsibility of the Department's Division of Plant Industry. A very strong relationship between this branch and the agronomists of the Agriculture Branch serves to underline the agricultural rather than the engineering aspects of soil conservation. Furthermore, the intimate association of Soil Conservation with the Department of Agriculture assists the development of this work in its true perspective and close relationship with general agriculture in South Australia.

Extension Services and Information

In recent years the Department has been organized into the four broad Divisions of Plant Industry, Animal Industry, Administration, and Extension Services and Information.

While some other Departments of Agriculture in Australia give individual status to a group concerned with Extension Services and Information, South Australia is the only State which offers this group full divisional status alongside the major technical Divisions of Plant and Animal Industry. This was deliberately done, to underline its importance and to safeguard effective collection, collation and dissemination of information and the development of soundly based extension programmes throughout the whole organization.

The Department of Agriculture in its advisory work is the collector, grader and sorter of ideas which must be suitably wrapped and distributed to those requiring them. It is not simply a matter of telling or teaching new facts. There is no more important aspect of the Department's work than the proper salesmanship of new knowledge and new ideas. The task is not complete until the new knowledge is accepted as part of the appropriate farm structure. An understanding of the human problems of

this work is vital to the effective operation of the advisory services. Only by close and regular attention to sound public relations through the press, the radio, and contact with groups can the Department fulfill its true advisory functions. Individual farm visits are the ideal, but expense forces the use of publicity techniques.

Applied Research

Undoubtedly the main functions of the Department of Agriculture concern the extension of agricultural knowledge, which, in itself, involves an appreciation of research. While the Department in South Australia leaves fundamental research to the C.S.I.R.O., the Waite Agricultural Research Institute and the University, it does concern itself with a wide field of applied research. This is regarded as the first and most important step in any advisory programme. The sorting out and sifting of new knowledge under local conditions is the job of the Research Centres and the research officers of the Department.

Every advisory officer should work in an atmosphere of inquiry to keep vitally interested and efficient. In fact, there is no doubt that an atmosphere of inquiry is basic to the vitality of the Department's advisory and protective services. For officers to become mere purveyors of the facts and ideas discovered by others or to act always as policemen would be soul destroying. On the other hand, the association of all advisory officers with some investigation helps to sustain vitality and interest.

Country Research Centres

The problems of administering research centres and experimental stations has been met by the establishment of a Research Centres Policy Committee. This Committee determines annually, at the highest departmental level, the policy of development and investigation for each of the country Research Centres. At least one meeting a year is devoted to the programme of each Centre. An important aspect of its work is the co-ordination of activities of technical officers—those stationed at the Research Centres and those working from Head Office.

The Research Centres Policy Committee consists of the Director of Agriculture (Chairman), the Chiefs of the Divisions of Plant Industry, Animal Industry, and Extension Services and Information, the Secretary of the Department, together with the Officer-in-Charge and the senior head office liaison officer responsible for the

particular Centre under consideration. For example, when the Wanbi Research Centre programme is under discussion, the Committee consists of the five permanent members (Chairman, Divisional Chiefs and Secretary of the Department) together with the Soil Conservator and the Officer-in-Charge at Wanbi. All have equal status as Committee members. The Scientific Liaison Officer is the secretary of the Committee. This administrative arrangement serves to relate the work of the Department as a whole with that of the Research Centres, and at the same time preserves the necessary autonomy of management by the Officer-in-Charge.

The functional organization of the Department is set out in figure 1.

Agricultural Bureau of South Australia

The one big asset the Department in this State has is a widespread and long established farmers' organization—the South Australian Agricultural Bureau. This organization was established as long ago as 1888, as a non-political, non-sectarian organization of farmers for the mutual exchange of agricultural information. It is controlled by an Advisory Board of Agriculture, through which

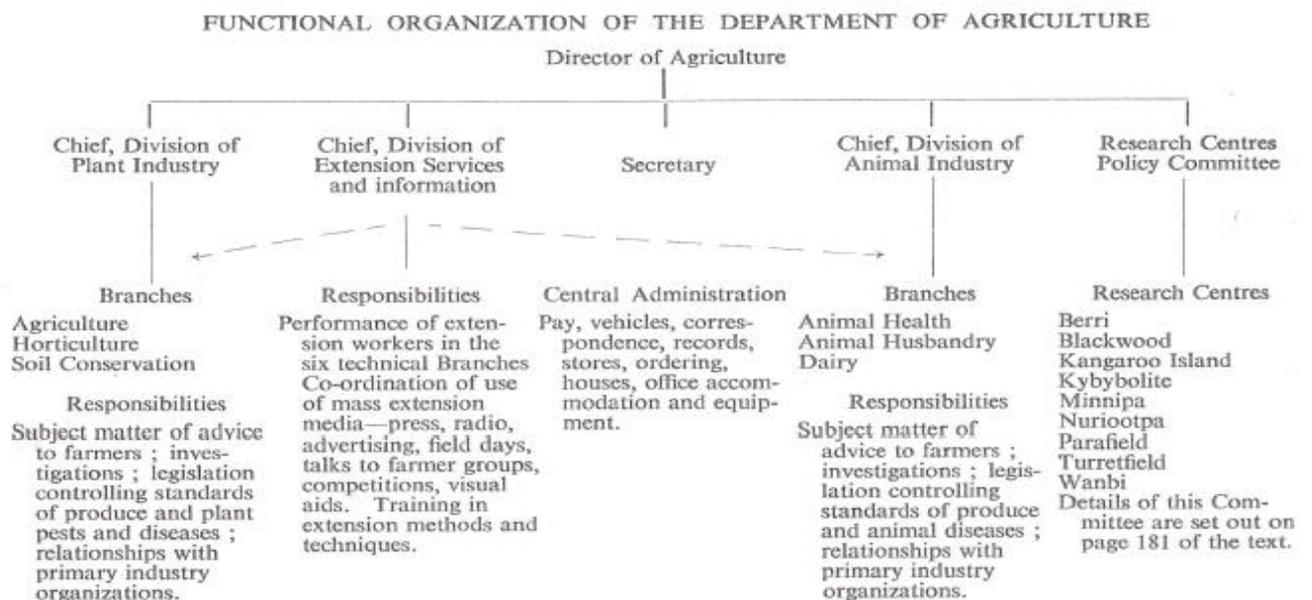


Fig. 1

there is direct liaison with the Department of Agriculture. The Department provides the central office staff and facilities of the Bureau. There are over 9,000 members, grouped into 238 branches, covering the whole of the agricultural areas of the State. Each Branch meets regularly at least 8 to 10 times per annum, and 20 regional conferences are organized by the Department of Agriculture in collaboration with the Advisory Board of Agriculture. An annual three-day Congress is held in Adelaide. The South Australian Agricultural Bureau offers one of the most effective formal group contacts for extension work in agriculture that exists anywhere in the world.

Women's Extension Work

The interests of country women are catered for by the Women's Agricultural Bureau, and by an extension service for country women which has liaison with the Country Women's Association, the press and radio.

Rural Youth Movement

The Rural Youth Movement in South Australia also represents an early formal group contact for the agricultural advisory work of the Department. This movement, organized and administered by the Department of Agriculture, is the equivalent of Junior Farmer Organizations in other States. It not only serves the same purpose but also provides the reservoir of members for both the Men's and Women's Agricultural Bureaux. In this way early contact and continuity of interest are obtained.

It is fortunate in this State that all the main formal organizations associated with adult agricultural education are the responsibility of the Department of Agriculture. The success or otherwise of the Department's dual function depends essentially on its relationships with the public. In South Australia the Department has done and is doing everything it can to foster sound public relations, not only with the farmers who are its direct concern, but also with the community as a whole, upon whose support the Department depends.

Advisory work with the agricultural community falls into two categories—short and long term. These are based on an appreciation of the immediate and long term needs of farms and farmers. In the following section, an attempt is made to illustrate some of the more important land use changes which it is believed have been

brought about as a result of systematic work by the Department of Agriculture. Reference is also made to short term efforts which frequently fit neatly into the continuing, long term programme.

Balancing the Agriculture of South Australia

Not all the factors affecting land use are environmental. Indeed, within the framework of a given type of agriculture, the social and economic factors are probably just as important. Admittedly, the environment provides the main determinants, but social and economic forces provide the desire, incentive, and satisfactions which contribute to the pattern and detail of any farming system. All three forces have operated very strongly in the agricultural development of South Australia so that, today, we see a pattern of land use which has been defined by environmental limitations but modified by social and economic forces.

In the early days of South Australian agriculture, wheat growing pioneered the way. In the beginning, wheat growing spread out from Adelaide, more or less indiscriminately. Many of the higher rainfall areas failed as wheat land because the soils were unsuitable. In some cases, topography was the limiting factor. Cropping spread more and more into the regions of better soil types, notably the red-brown earths of the Lower, Mid and Upper North, and finally into the Mallee areas. The expansion of the wheat area went too far. One facet of the environment, the soil, was exploited, without due regard to the adequacy of the rainfall. The result was the marginal wheat lands problem of the 1930's and the need for the adjustments which were subsequently made. Large areas of country in the Murray Mallee, in Central and Northern Eyre Peninsula, and in the Upper North were rehabilitated, largely by amalgamating three former wheat farms to make one larger mixed farm, on which livestock and less frequent cropping provided the basic formula. This was a large-scale, purposeful land reform, founded on agricultural principles.

Our pioneer agriculturists who cleared the land had little knowledge of their new farming environment. There was no tradition of permanent farming for Australian conditions. To compensate for the isolated life, the slow process of clearing and the general slogging necessary to bring virgin land into production, the pioneers were entitled to as much compensation as they could get. Exploitation was often the key

to sheer survival. A forgivable attitude, but one which could not continue without spelling the ruin of the country which they had so valiantly developed. A system of cropping was the outcome of these human attitudes and limited knowledge of the environment. Sheep were the concern of the pastoralist, who used natural bush and grass to feed his flocks. Farmers and graziers were people apart, with entirely different ways of life.

The outlook for Australian cereal farming was revolutionized at the turn of the century. The introduction of fallowing, in accordance with dry farming principles, the use of superphosphate to overcome the general phosphorus deficiency in our soils and the production of new wheat varieties by Farrer and his successors, opened new and wider horizons. But none of these developments affected the basic limitation of the wheatland soils. They speeded rather than decreased the rate of nitrogen exploitation and provided no basis for permanent arable farming. A fallow-wheat rotation was almost universal and the yields of this continuously cropped land, after the recovery of the 1890-1910 period, showed a steady decline. Cornish, in his statistical studies, showed that a steady decline in yields per acre took place from the early days of settlement until about 1900. This was followed by an upward trend which reflected the benefits afforded by the three new factors—superphosphate, fallowing and better varieties. The next 25 years, however, showed a levelling out and, in many cases, a decline in yields.

The introduction of superphosphate, fallowing and better varieties were indeed catalysts to the vicious system of soil exploitation by continuous cropping. They removed certain limiting factors but enabled the soil to be more rapidly exploited under a monocultural system. Apart from exhaustion of soil nutrients, excessive cultivation contributed to the ruination of the structure of the soil and exposed it to erosion. Experience made it clear that the continuous cropping system was leading to soil depletion, reduced productivity and erosion. A continuance of the system meant ruin. It was at this stage that a determined agricultural advisory effort was made to bring about reforms. The problem was to diversify the system of land use and increase productivity. It was recognized that the key to the change was the introduction of both legumes and livestock onto the farms. A few farms made the

change in the 1920's and these changes in pattern, as well as experimental work to prove the advantages of the changes, consolidated agricultural thinking and determined a new extension programme.

The introduction of a short "no cropping" period into the rotation had about this time been adopted by many. Volunteer clovers and grasses, together with weeds, made up a poor quality ley. Livestock, as a token to the system rather than as a means of increasing production, appeared on farms. Fat lamb raising was advocated because the lambs were raised during the winter period and disposed of before the shortage of feed in the summer and autumn. They fitted the environment neatly.

There was considerable resistance to change. Prejudice, as well as the inclinations and skills of the farmers, centered around wheat growing and wheat growing alone. There was very little economic incentive to make the change. In fact, during the depression cash was so short that the advisory services met a blank, unresponsive attitude when it was suggested that cropping and fallowing should be reduced and a greater proportion of the farm devoted to livestock production. Wider rotations called for renewed fencing, subdivision, water supply and other improvements needed for livestock. These were too much to contemplate at that time. There was also the human problem of developing new skills. Fortunately, the advisory services were strong in their convictions and insisted that the whole system must change if the country was to be stabilized, soil fertility restored, production maintained and erosion checked.

The farming community was slow to respond but attention had been forcibly drawn to the needs. While farmers were interested in the changes where they had been made and demonstrated, they had not yet felt the desire and conviction to take the necessary action and bring about the change.

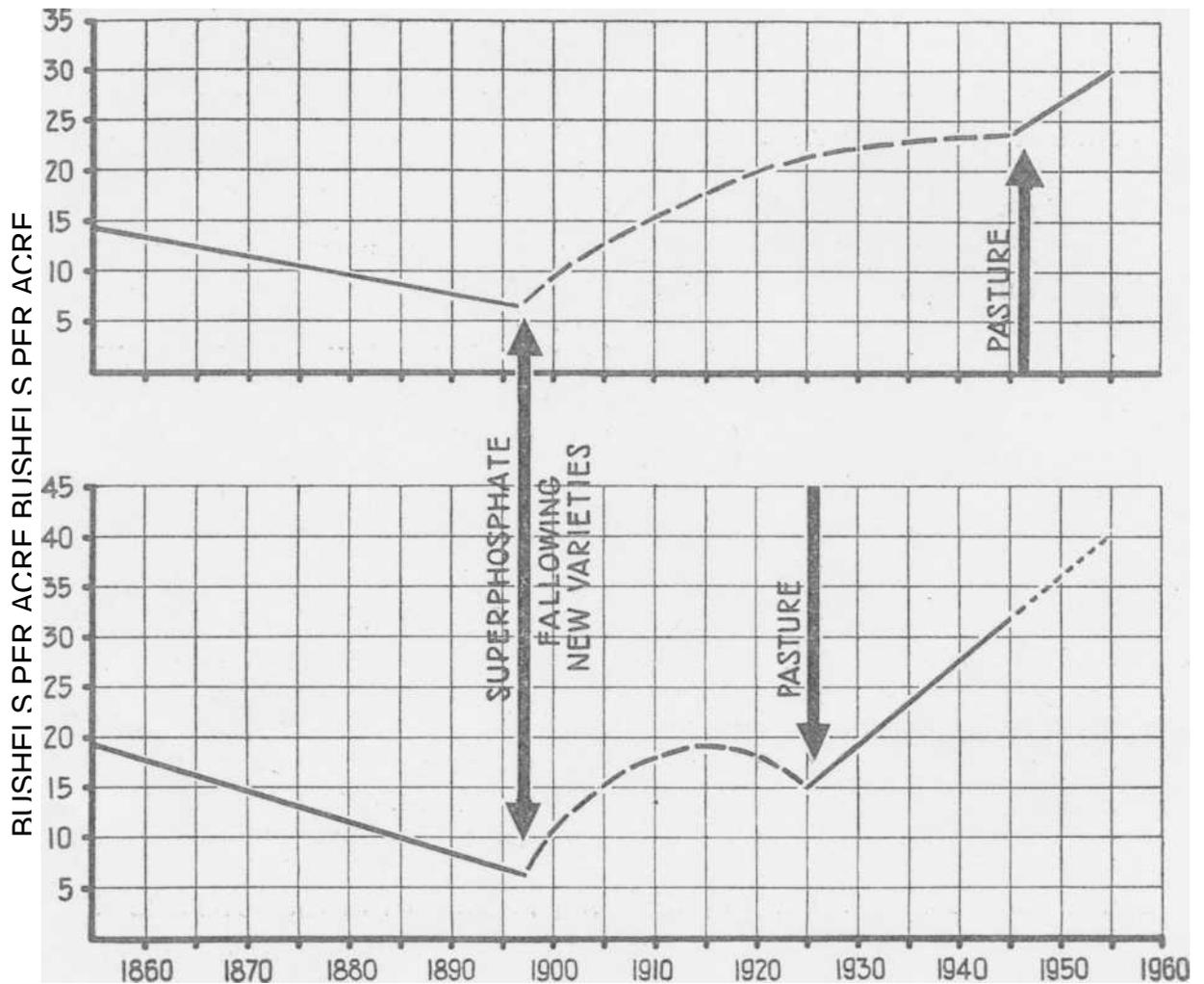


Fig. 2—Wheat yield trends on a mid-north cereal farm (lower) and County Victoria (top) (after Cornish).

Here is an example of the extension process, a deliberate attempt to change the whole pattern of agriculture to conform with what investigation and experience had indicated was the correct land use for the climate, soil and topography of the country. The process met social resistance. The changes were not in line with the historical and traditional practices which had preceded them. The changes did not suit either the inclinations or the skills of those concerned. More important still, the economic climate was unfavourable. Markets and prices of the alternative products to wheat, mainly livestock produce, were not favourable. Nevertheless, recognizing the needs, the Department of Agriculture proceeded with its campaign for change.

Developments during and especially after the war, eliminated the economic barriers

and soon the social resistance gave way. Suddenly the ideas which had been talked of, unreservedly advocated, demonstrated and promoted in every way possible by the advisory services, caught on and a complete change-over took place.

Interestingly enough, trends on individual farms indicated that the same quantity of wheat could be produced on about half the acreage where wider rotations and livestock farming had been practised long enough to restore soil fertility. This is well illustrated in figure 2.

(a) for a particular farm where the change took place in 1921 ; and

(,b) for the whole of a County where the change became general about 1945.

Since the war, practically every farm has adopted the new system of farming. It is a diversified system. Only about a quarter of the farm is now devoted to grain production and practically the whole of the remainder to livestock or to alternative production associated with livestock. Formerly such farms would have been half wheat and half fallow. The over-all effect of this change is vividly portrayed in the graph showing the wheat yields for South Australia. The downward trend in yield from the 1860's to the 1890's is clear. The recovery, levelling out and later decline from the 1900's to the 1930's which followed the introduction of superphosphate, new varieties and fallowing is illustrated by the next part of the graph. In the 1940's when the whole land use pattern changed, yields have been lifted substantially and the movement is unmistakably upward. This remarkable change in land use is not only an example of effective long-term extension work, but it emphasises the extreme importance of human factors in the extension process.

It is not generally recognized that the process of extending knowledge is so dependent upon favourable human reception. Any extension service that neglects to take into account human factors is unrealistic in its approach. It is not just a question of new principles and new knowledge as many may think, or the adoption of practices in conformity with environmental factors.

It involves a careful understanding of social and economic forces which determine

human preferences and decisions.

There are two categories of advisory work. The first is general and long-term. This has as its base the fundamental principles

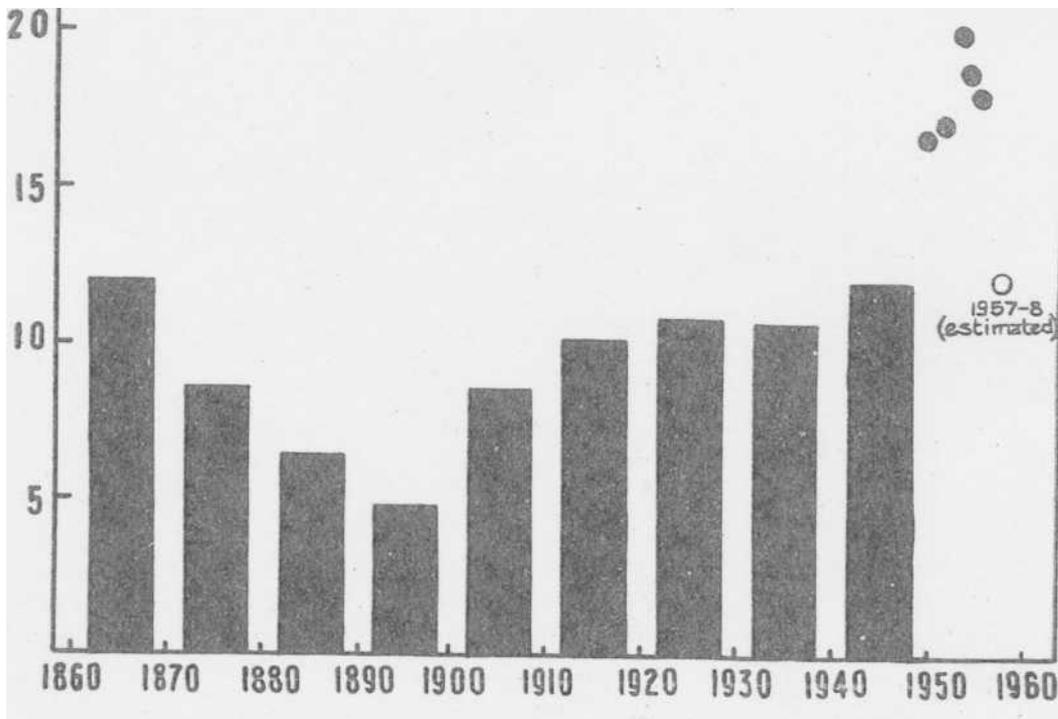


Fig. 3—South Australian wheat yields in bushels per acre.

of agriculture and it must contend with a developed situation based on the results of trial and error and superficial experience rather than on sound investigation and basic knowledge.

A second category is specific and short term. Specific changes are often very readily accepted by the farming community. They include such things as new controls for plant and animal diseases or the use of trace elements or a special fertilizer. An example of this category in the general story just related is the fairly rapid adoption of superphosphate. The main advisory effort was to demonstrate the extent to which yields were increased by its application. This specific type of advice stands or falls on

its immediate results and capacity to increase profits. Generally speaking, such methods are readily applied without serious modification to existing skills or inclinations. On the other hand, the desirable broad general changes in land use are not readily accepted. At bedrock is personal resistance to change or the inability to make changes for economic or social reasons.

In any agricultural advisory programme there are certain recognized steps which, generally speaking, have to be taken before success is attained. The first is to command the *attention* of those to whom the advice is directed. The next is to take advantage of this initial attention by developing *interest*, followed by the third stage, the creation of a *desire* on the part of the informant to make some change. Attention, interest and desire are not enough and, before any major change takes place, *conviction* is necessary before the next step in the process namely, that of *action* to make the change. Even then the process is not complete until those who have made the changes realise with *satisfaction* that the change has been wholly desirable, and an advance both agriculturally and economically. The changed pattern in South Australian agriculture illustrates this extension process.

Although in the 1930's the attention of farmers was drawn to the new doctrine of diversified farming, their interest aroused and many had the desire to make the change, the principles were in themselves not enough to convince. It was only after years of demonstration of farm changes that many farmers were sufficiently convinced to take action. In some cases it was impossible for them to do so because

- (a) of financial difficulties and the lack of financial incentive; and
- (b) they hesitated, knowing that new skills were needed.

After the war the dramatic rise in wool prices, particularly, drew attention to the tremendous rewards available to anyone raising sheep. Tractor farming replaced horses and the need to feed them. The relative changes in wool and wheat prices were undoubtedly of greatest significance. By 1950 wool had increased 9.2 times in price over that in 1945 whereas wheat increased only 1.7 times. Undoubtedly the economic changes in livestock prices brought about conviction and action. In the last 10 years those who have made the change have reaped the reward of higher productivity and greater soil stability. Apart from being far more efficient wheat

growers than ever before, total farm production has increased enormously. The change has given satisfaction and has been wholly accepted and recognized. It will stay and, for this reason, this extension programme is completed.

The Future

Agriculture is never static. In South Australia, ours is maturing. The present phase, an achievement in itself, is also one which sets a firm and permanent foundation on which our future agriculture will be built. Australia is developing rapidly and will undoubtedly carry a much bigger population than was contemplated 20 years ago. Present production levels of foodstuffs, particularly high protein foods, are not enough to meet future home needs, so that intensification must be a feature of the next phase in our land use. The economic incentive will come with population. There are no markets as good, or as sound, or as stable as home markets. During the depression, sidelines were advocated. The motives of farmers were exemplified in an economic slogan; "Don't have all your eggs in one basket". The times were difficult. As prices came down, fixed and committed costs remained high. Every penny counted, whether spent, saved or received. Sideline production was temporarily accepted under economic pressure but was never agriculturally sound. *The idea of peasant farming under Australian conditions, apart from being repugnant to Australian attitudes and ways of life, was not compatible with the environment or the wide open spaces of our land.* It is now realized that valuable labour and time can be dissipated uneconomically on sidelines, to the neglect of the major enterprises. To this end, only a business approach to new avenues of production will lead to their permanent establishment and integration in our farms. Many who reluctantly undertook sideline production would not return to them under present-day conditions, because of their earlier unsatisfying experiences.

Present prosperity is not conducive to the ready acceptance of intensification on a business basis, especially with livestock enterprises. Several factors are involved, all of which are either social or economic. The farming community is prosperous and a general reaction is that the incidence of income tax does not make it worthwhile going to great efforts to increase production. There is a strong personal prejudice against some undertakings like poultry keeping or pig raising, regarded as too humble, or even undignified. Part of this is due to the after effects of sideline

experiences in less prosperous times. There is also a strong resistance to the employment of labour. The tendency is to look for a machine to do the job—to adapt an existing one or wait for a new invention. Labour on the farm complicates management.

All the indications are that the social and economic circumstances are not yet right for adoption of an intensified phase in agriculture. In spite of this, beef cattle raising is already gaining acceptance. In this instance, there is no social prejudice against the occupation. Further, beef cattle can be run easily in conjunction with sheep and reduce wastage of feed. The future advisory aim should be to see that poultry, pigs and, to a lesser extent, dairying are removed from sideline status to enterprise levels.

The established pattern of land use is tending to increase farm size. This trend cannot go on indefinitely because of the increasing numbers seeking farms and the limited amount of suitable land available. Mechanization and efficient use of machines, plus the need for wider rotations are the forces tending to increase farm size. One logical consequence of this is the American type of large- scale specialization of farm production, using factory techniques.

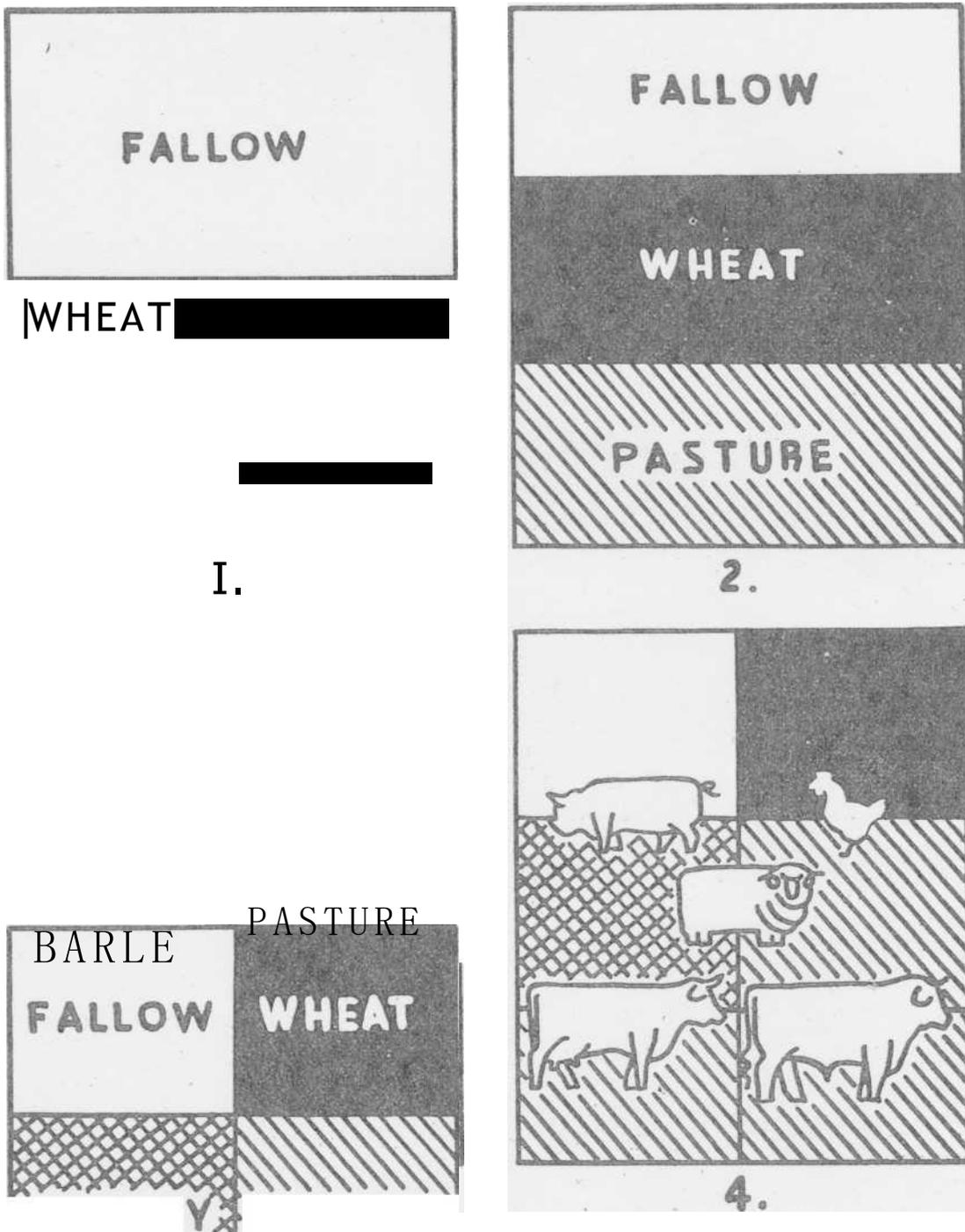


Fig. 4.—Changes in the land use of the typical South Australian cereal farm

This industrialization of agriculture is very often not in keeping with scientific land use, nor is it socially desirable. It is an inflexible, soul-less system which exploits productivity to meet rigid financial commitments. Overheads are high, margins are

fine and production is geared to these considerations rather than to the needs of the land and the life of the family.

Our land use in South Australia has been successfully and permanently modified by the use of sheep as an integral part of an arable farming system. This modified system gives strength and durability to our agriculture. Its future rests on the realization by all who practice it of the need for the three C's—Continuity of Carrying Capacity. Over-stocking and inadequate provision of reserve feed supplies are the twin dangers. It would be calamitous if by turning from over-cropping our farmers went to the other extreme of over-stocking. The alternative to specialization or over-stocking is greater diversification of production, not haphazardly but on sound business lines—not as sidelines which can waste effort, but as properly thought out units or enterprises which channel new and special effort into profitable production. The conversion of much more farm production into animal products on the same farm will become not only necessary but economic as home demands for protein foods of animal origin increase. Our present Australian population consumes three quarters of our meat, two-thirds of our eggs and two-thirds of our processed dairy produce. At present export markets take the balance but the expected doubling of the population in the next 30 years will call for substantial increases in the production of these types of foods.

Generally speaking, the steady increase in production since the War has been satisfactory. There will be considerable increase as the present developmental work in the State is consolidated. Although there has been considerable development of new lands since the last War, these areas are by no means in full production. But new development cannot go on indefinitely. It will not be long before all land suitable for agriculture has received initial development. Further great dividends await the application of known principles of scientific agriculture on many farms. The keynote is and will be increasingly, farm management.

There is and will be need for a purposeful intensification which calls for new practices, the overcoming of prejudices, the development of new skills and, above all, the adoption of sound business principles in the management of the farm. There

are some who are already pioneering the way and showing the great levels of diversified production that can be attained by adopting such principles. In the years that lie ahead, an extension programme for greater intensification of production per farm will receive more attention as the needs increase. Ultimately, the relaxation of social prejudice, the development of new skills and the removal of economic barriers will lead to more widespread adoption of its principles.