



LOOKING BACK AND FORWARD

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A. INTRODUCTION

With my training and experience in Livestock Production of over 50 years and still learning, I evaluate pasture by how it may be utilised and by what it will produce. Though I recall one research worker some years ago who stated that the sheep was the enemy of good pasture!

Hence my remarks will not be confined to pasture, but also to those developments that are associated with either the production of pasture or derive therefrom.

We will first look at some of the major developments in the industry since the mid 1930's and then at the challenges and likely developments in the next 50 years.

B. LOOKING BACK - PAST DEVELOPMENTS

1. TECHNOLOGY

The outstanding development has been in technology of agriculture. In 1935 the departmental publication "A Handbook for Farmers" was reputed to contain all the basic information that a farmer needed to operate his enterprise. Furthermore many departmental officers considered that they were well informed on the whole field covered by the handbook.

Today we see almost a whole floor in head office filled with people devoted to just one of the chapters, and no one feels that he is well informed on all facets of that subject.

We went through a period in the late 30's and 50's of tremendous developments of technology in many fields to the extent that technology outstripped management ability particularly as to the "whole farm" concept of management. Only of recent years has the balance between whole farm management and technology been re-established.

2. MANAGEMENT

Management has seen a similar degree of development.

In the 1930's management was low-key and more pre-occupied with the daily tasks "on farm" and dealing with the various seasonal tasks as they came around. Finances were very restricted and there were few resources available for the development of improvements. Stock losses were high and reproduction rates low for reasons to be discussed.

Farming was accepted as a way of life in which return on capital was low, but the individual enjoyed certain freedom as to how he lived his life.

In general if you produced more, you were better off. There was great caution against over-stocking, due to fear of drought - either partial or general. There was little or no supplementary feeding for production.

Today, in most cases, management has adopted some if not all of the following:

Clearly defined objectives

Planning for routine operations and development

Good business operation, budgeting, cashflow monitoring and progress assessment

On farm field trials

Off farm business operation, including marketing, quality control and brand recognition

Computerised record keeping

Farm operation is a sophisticated business operation, complicated in most cases by the workplace also being the family home.

There is general recognition that to maintain the competitiveness in the industry, there has to be considerable re-investment in the enterprise. Hence the saying farmers live poor and die rich. They have little spare money during their working life, but when they die their assets have increased.

3. CLEARING

Immediately after World War 1, there was, at least in the tablelands, widespread ringbarking of green timber, many areas by the 1930's still carried dead timber, some standing and much dead timber lying on the ground and some establishment of native grasses by natural regeneration as far as was permitted by the heavy rabbit population and limited grazing, usually by sheep.

Since then we have seen the full cycle of packing and burning the dead timber, and the recognition of the need of timber for shelter. Then the experimental work after W.W.2 in natural regeneration of timber, species trials in various areas and the development of an economical method of seedling tree planting by a few pioneers.

This has been followed by a much more widespread interest in reforestation and of recent years there have been big advances in direct seeding, establishment techniques, weed control etc.

4. RABBITS

Are highly selective graziers and had eaten out the finest and best native grasses and were the prime cause of erosion.

A major development has been the control of rabbits, first by netting subdivision, hunting by dogs and digging out, then also by fumigation, use of larvicide and then myxomatosis.

Many past droughts and erosion have been rabbit caused rather than seasonal.

5. PASTURE

(a) Establishment of improved pastures. Firstly sub-clover introduced to native pasture with the aid of superphosphate and seed inoculation and later of improved grass species

(example). This greatly improved the nutritional value of the native grasses and also extended their growing season.

(b) As a complement to control of soil erosion. At first pastures were improved on the lower more fertile flats and foothills and were subject to severe erosion from the higher catchments.

(c) The value of the closed sward of pasture in controlling erosion and improving water retention was recognised together with the need to reduce run-off starting from the top of the hills downwards as well as the need to retain rainfall as high up as possible.

(d) Soil conservation works were developed as banks and furrows high on the catchment to reduce the speed of run-off, dams to reduce surge were built, contour farming was introduced as part of an overall conservation of soil, water, pastures, shelter and wildlife (example).

(e) As fertility was built-up, improved grasses have been introduced and have in turn closed the sward, reduced run-off, retained moisture and produced much more nutritious pasture with a longer growing period. They have also helped control weeds.

(f) Problems of soil acidity and salinity have built up during this period and now present the greatest challenge for the future.

6. WATER SUPPLY

Another great development in the period has been in improvement of water storage. In the thirties the horse dam sinking teams were limited in their ability to construct dams, even relatively soft rock prevented dam construction, or led to the abandonment of part constructed dams.

With the advent of bulldozers and rock rippers after W.W.2, there were few sites in which good dams could not be built. There has also been great advances in boring equipment and the geology of likely bore sites. It is fair to say that any farmer who has owned his farm for some years has little excuse for ever being short of stockwater.

In many cases it has also been possible to provide useful "on farm" irrigation water storage.

7. ANIMAL HEALTH

There have been great developments in this area:

(a) Vaccines have been developed for diseases such as black disease, which in the thirties caused annual losses in excess of 15% on some properties. As pasture quality improved, enterotoxaemia took its toll, particularly of lambs. Today we have vaccines against all the diseases of economic importance.

(b) Internal parasites have been controlled by the development of new and more efficient drenches and/or injections. There is a note of caution for the future due to the build-up of strains of parasites resistant to the available drenches.

- (c) External parasites are now much better controlled with the development of non-arsenical insecticides.
- (d) Blowflies. Though still of considerable economic concern have been better controlled, firstly by the Mules operation at lambmarking and by better jetting equipment and chemicals and by better general health of stock.
- (e) Nutrition. Better nutrition has improved the productivity of livestock and contributes greatly to their resistance to parasites. This has come from better pastures and better pasture management and husbandry practices.
- (f) Resistance. During this period we have seen a dramatic build-up of resistance by animals, plants and pests to chemicals.

8. EDUCATION

(a) Management in the 30's was trained by the jackeroo system with almost complete reliance on practical training and learning by ones own experience. Training was all within the farm gate. Today we have a good balance between on-farm learning of farm skills and off-farm formal farm business management training. There is recognition that whilst anyone can learn by their own experience, a wiseman can learn a lot from the experience of others.

Formal training is now available in both management and technology from a range of institutions appropriate to the level at which the student finished secondary education.

(b) Staff training. In the thirties staff learnt farm skills on the job, and often were very limited in the breadth of their experience. There is a growing recognition of the value of a sound basic education and some trade training at least for staff. There is still a long way to go in this regard; however there is good evidence on many properties of the sound economic value of well trained staff.

9. FARM LABOUR

In the thirties farms were labour intensive. Little technology or mechanisation was available.

Some idea of development in this regard is shown from the fact that in the thirties, if one man cared for 1,500 sheep and their water supply and probably cut the weeds in their paddock, he was thought to be doing his job. By the end of W.W.2 the soldier settlement scheme was based on a man caring for 2,500 sheep, thanks to improved technology. Today this figure is nearer 4,500 with many properties where one man cares for up to 10,000 D.S.E.

Technology has gone from a man on horseback or sulky and horse drawn equipment to one on a well equipped motorcycle or four wheel drive vehicle. In most cases efficiency is further improved by two-way UHF radio between staff and management together with the use of reliable equipment for almost all jobs from fencing to water pumping.

10. PRACTICAL GENETICS

There has been great developments in the use of genetical knowledge in both plant and livestock fields.

Plants. The development of new strains and hybrids of clovers, medics and grasses has made possible great improvements in the availability of suitable species for specific environments and purposes. These may be easier establishment, better survival, longer growing period or just better quality nutrition.

Livestock. In the subject period there has been great development of the understanding of genetic principles and of selection for production and reproduction; also of stock to meet specific market demands, for example beef for a specific market at a specified age.

Breeding practices have also improved, with better management of breeding stock. Artificial insemination and embryo transplants have added another tool to the equipment of the breeder with a specific purpose and another hazard for the ill-informed breeder.

C. LOOKING FORWARD - THE CHALLENGE

1. LAND USAGE

Pressures for alternate land usages are sure to increase. The need to feed and clothe a growing population will see much grazing land converted to cropping and there will be continued loss of grazing land for residential, industrial and service purposes. In many cases their value of land for recreational or water catchment may exceed its value for farming.

2. LIVESTOCK NUTRITION

The critical challenge is to provide a better and more uniform plane of nutrition from our pastures. There will be increasing demand for livestock products from reduced grazing areas. There are economic and management limitations on feed-lotting and grazing of crops. Hence the challenge is to provide a better and more uniform plane of nutrition from our pastures.

Australia is uniquely placed as to the climatic conditions for the pasture raising of livestock, and to remain competitive in world markets we must exploit this. Unfortunately our soils are geologically very old and fragile.

Livestock production can be greatly improved by better pastures. Not only is it necessary for direct increased production per animal, but also for:

- (a) Improvement in livestock health and reduced need for costly and environmentally hazardous chemicals.
- (b) Better effective reproduction rates.

(c) Ability to assess and develop genetic progress to produce more efficient livestock. Improvement in productivity cannot be manifest unless the animals enjoy a plane of nutrition sufficient to enable them to achieve their full potential production.

3. MAIN FIELDS FOR DEVELOPMENT

The main fields for development therefore are:

1. Pastures
2. Management (incl. Marketing)
3. Education
4. Livestock
5. Other.

3.1 PASTURES

3.1.1 THE SOIL

Whilst there may be some additional areas brought into grazing, it will generally be more economical to improve the existing pasture areas.

The acid soil syndrome is without doubt the greatest challenge to our high to medium rainfall pastures. It is very doubtful whether depletion of lime content is the sole or even main cause of the rapid increase in this condition. Certainly the application of heavy dressings of lime to pasture as presently carried out in some areas does not offer any effective, let alone, economic solution for the bulk of the non-arable grazing country.

We are only at the start of our necessary understanding of the infra-structure of our soils, and in particular the interactive role of soil bacteria, microrhiza, earth worms, etc.

The challenge appears to be to find how to build up the organic content of our soils and their physical and organic texture.

This should then result in both pastures of improved and more uniform nutritive value and a longer growing season.

It may mean in practice (if one is permitted a glance into the crystal ball) that chemical fertilisers such as superphosphate may be largely replaced by organic fertilisers produced from the processing of urban wastes which now pollute our oceans.

Plant Breeding

To benefit from the improved soil studies and their results, there will be a need for developments in plant breeding, hybridisation and genetic engineering to produce plants of improved nutrition, volume of production, better survival and disease resistance.

Genetic engineering should let us transfer nitrogen fixing abilities to grasses, (maybe the best long term solution to our acid soil problems) and the drought resistant qualities of our natives (e.g. spinnifex) to improved species and many other such attributes as yet unthought of.

3.1.2 CONSERVATION

Complimentary to the above, we must practice better overall conservation programs to co-ordinate the conservation of soil, water, pasture and shelter. There is an urgent need to restore the ecological balance of the environment. (Refer the Louis Bromfield concept.)

The present Soil Conservation Service "Farm Plan" concept is sound but is still limited to direct aspects on conservation rather than the overall ecology. It is also severely restricted by lack of resources and probably as a result of that is poorly promoted.

Farmers need some simple guiding principles on which to work, such as:

- (a) The value of a closed sward of pasture as one that will continue to improve its organic content and water retaining ability.
- (b) Erosion must be controlled from the tops of the hills downwards, and not the reverse.
- (c) Retain water as close to the top of the hills and for as long as possible. This may be by all or any of denser pasture, absorption banks, surge dams and grassed waterways etc.
- (d) Erosion is never static, it is progressing or healing. If the latter time will heal, if the former, the longer it is left the more expensive will be the cure.
- (e) Salt control, in the short term by retaining saline seepage in dams and by planting suitable tree species in the affected area. In the long term tree planting in the higher areas from whence the seepage generates.
- (f) Develop further the techniques of tree establishment - there has been great advances in the past decade, but there is need for more. We will never "Green Australia" just by planting tree seedlings, this will probably not keep up with natural wastage. Methods of direct seeding and regeneration must be further developed.
- (g) Provide a suitable environment for the native fauna that are valuable for pest control (e.g. ibis).

3.2 MANAGEMENT

There must be further development of property management skills in many fields. (See also Education below.)

Management should have three basic abilities:

- (a) To know when it does not know enough and hence needs advice.
- (b) Where best to go to get this advice.
- (c) The ability to assess such advice for the particular enterprise and to accept, amend or reject it for the overall management plan.

The "whole farm" concept must be maintained within which enterprise assessment operates.

Objectives, short and long term must be defined and an overall plan detailed to achieve these objectives.

Quality control of all farm production must be enhanced, and monitored.

Marketing, including presentation or packaging, transport, promotion and selling must become the concern of the producer. We must develop brand recognition of our products, quality control and through year availability.

Business operation of the farm, in most cases can be greatly improved at little if any cost. Good budgeting, cashflow management and review of objectives and plans supported by better office procedures and use of computers and other electronic equipment need development.

3.3 EDUCATION

Better management comes from better education of both management and staff and of the infra-structure which services farmers.

(a) Management needs training not only in farm skills, but in business operation and with a sufficient knowledge of basic technology to give effect to technological advice. This requires an educational plan involving both practical "on farm" and formal management (institutional) training.

(b) Staff training has room for great development. In the future efficiently managed enterprises will have staff who not only have a well balanced range of farm skills but also have some formal trade training in aspects of farm operation, at TAFE level at least. (Example.)

(c) Service industries, such as finance, fertiliser, agricultural and veterinary chemicals, marketing etc, will require staff with wider understanding and training in farm management so that their advice may be more relevant to management programs.

3.4 LIVESTOCK

3.4.1 Livestock Breeding. Major developments will be in selection for both better production and survival and with higher effective reproduction rates.

Selection will be more effective given planes of nutrition that enable animals to display their full potential. Animals will be bred and managed for specific markets and specific environments.

3.4.2 Genetic Engineering. Will play a big part in producing more efficient strains and for the removal of inherent defects.

There will be need for great foresight and care to ensure that the overall soundness of our stock is not prejudiced in the race for short term productive gains. For example there

will be no point in improving the production of meat or wool dramatically if there is at the same time some loss in disease resistance or reproductive efficiency.

Breed Societies must now plan their policies and define the procedures, record keeping and certifications needed.

3.4.3 Livestock Health. I firmly believe that livestock health and production is primarily dependant upon the availability of a constant high plane of nutrition. Animals on adequate nutrition have a much greater ability to develop resistance to parasites and infections than those under nutritional stress or deficiency.

Whilst there will always be a need for certain vaccines, drenches and pesticides there must in the future be much more reliance on management and nutrition than there has been of recent years, when chemicals offered a short term alternative to good management practice.

We will see development of stocking policies which break parasite life cycles rather than drenching programs, including alternate stocking with different species. There may also be development of biological controls to break parasite life-cycles. There must be less dependence on chemicals on both ecological and economic grounds.

3.4.4 Economic production. There will be greater appreciation of economic production. There is a level of production or stocking rate that is optimal. Above this level greater inputs of resources are required than the value of the additional production warrants. Given an assured increased demand (market price) for this production then such increased inputs may be economical. In all development and management systems, it will become increasingly important to strive for optimum rather than maximum production.

3.5 Other.

4. CONCLUSION

We have seen something of the great developments of the past 55 years and have identified the fields in which the main challenges for the future lie, based on our experience to date.

No doubt there will be other unforeseen challenges, be they the Greenhouse effect or nuclear fallout, cosmic disaster or our pollution of our environment.

Meanwhile we have a pasture based economy unmatched elsewhere in the world, if we only have the wit and determination to meet these challenges.