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State Agricultural Extension Services

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TO understand and appreciate the organisation and work of State agricultural extension services it is necessary to look back over the years and find out how they were started and consider their subsequent development.

COERCION AND EDUCATION:

Public reaction to important problems is usually met by creating authority to do certain things by Act of Parliament. Extension work, however, was not established by the authority of an Act; rather it originated as the complement or alternative to the powers of coercion or financial assistance provided for in various Acts promulgated for the promotion or regulation of farming. The rabbit nuisance, noxious weeds, land settlement and financial assistance to settlers, land deterioration and development, inspection and grading of produce and the like have all been subject to control by legislation and all have led to complementary educational work not provided for by Authority. Inspectors have become instructors and the Lands and Survey Department, State Advances Corporation, Department of Maori Affairs, Soil Erosion and Rivers Control Council, and the Department of Agriculture are all engaged in furthering better farming. It will not be possible in this paper to trace the development and organisation of all State agricultural advisory services. It may serve our purpose best if I confine my remarks to that section of which I have some knowledge and present to you certain principles and problems in extension work which I think deserve your careful consideration. I will confine my remarks, therefore, to the Department of Agriculture and particularly to the work and problems of the Extension Division, of which I am Director.

DEPARTMENT OF AGRICULTURE:

The Department of Agriculture was established just over 60 years ago and arose from the amalgamation of the Agricultural Section of the Lands Department and the Stock Department. The Agricultural Section was developed as an advisory service to assist the Lands Department in its settlement work whilst the Stock Department arose from the need to stamp out scab and control rabbits. Gradually the Department evolved Divisions to control and advise on various aspects of farming and the processing and grading of produce. We now have the Animal Industry and Animal Research Divisions, Dairy Division, Extension Division, and Horticulture Division. Control has been exercised by Act, but no Statutory Authority has directed advisory or research work, although education and research have become the major activities of the Department.

INSPECTORS AND INSTRUCTORS:

I have mentioned the evolution of control and education in the Department because I feel that it is necessary to a proper understanding of the functions and work of the Department and the general knowledge and standing of its officers. The purpose of research, extension, and control is to increase the efficiency and volume of primary production and there must often be a measure of control, whether statutory or backed by the standing of a Department of State or other influential organisation, to complete the train of actions necessary to secure the adoption of better farming methods. For instance, we may secure the control of agricultural seeds by Act of Parliament (as is done in some countries) or by the influence and

services provided by an influential organisation (as is done here by the Department of Agriculture). However subdued this control may be, authority is often a necessary background in many aspects of developing better farming. Control as well as research is a companion of extension work. In the past inspectors have become instructors, for when they inspect they are called upon to advise. Little or no difficulty arises as long as inspectional work is closely allied to instructional work so that advice given by inspectors may be watched and regulated, but difficulties would arise if instruction and inspection were entirely separated. An instructor should not be an inspector, but should be closely associated with the work of inspectors.

EXTENSION DIVISION:

The Extension Division of the Department of Agriculture continues the work of the Fields Division which was initiated from the policy of closer land settlement in the 1890's and early 1900's. Development of the Division in the first 15 years of the present century was based on the establishment of large experimental farms — Ruakura, Mومamahaki, Weraroa, and Te Kauwhata—and a field staff of instructors recruited from the Department's inspectorial staff. The main field work was the initiation of co-operative crop and pasture production experiments and noxious weed control. An attempt was made to build up a professional staff just before the 1914-18 war, but the war disorganised the Division's work and in 1920 the control of the stations was centred in Head Office and there were only nine fields instructors at work.

E. C. CLIFTON:

E. C. Clifton was the inspiration and guide of the initial Fields Division. His service in the Department had covered the whole field of farming and he had an intimate knowledge of the country and its farmers. His aim as Director of the Fields Division was to improve pasture and crop production and the general standards of livestock. He was somewhat slow (and he was not alone in this) to appreciate the revolution that topdressing was to impose on farming and based a large part of the work on the experimental farms on the premise that diversification of farming was desirable. He considered that closer settlement would necessitate mixed farming, first to lower the farmer's cost of living and give employment to his children and second to raise and lessen fluctuations in income. Hence he made a feature of the integration of grain production (particularly for farm use), poultry keeping, fruit-growing, vegetable production, and bee-keeping, with dairying as desirable for settlers on small holdings. Here I think we learn a lesson in research and extension work. Farm management must be studied on the basis of commercial farming. Demonstration and research farms may supply useful initial data, but final assessments must be made from surveys of commercial farms. The extension service must undertake farm management research.

A. H. COCKAYNE:

In 1920 the Fields Division was reorganised on the basis of the professional instructor in agriculture and was freed from all regulatory work. Recruits were required to have the basic qualifications of a degree or diploma in Agriculture, preferably a degree, but the Division has never been able to recruit a full staff of University trained instructors. The reorganised Division commenced in 1920 with a staff of 14 including 11 instructors (two professional and nine general division). During the 1920's the Division received inspiration and direction from A. H. Cockayne. He brought to the extension service a scientific approach to farming problems, a wide knowledge of grassland farming, and the specialist staff of the Department's Biological Laboratory. He encouraged instructors to search for knowledge on local soil fertility problems, crop and pasture

production methods, and farm management. The Division was not associated with the management of any of the large experimental farms (which with the exception of Ruakura and part of Te Kauwhata were subsequently sold), but retained a number of small areas (such as Puwera and Marton) where field trials were conducted. Co-operative field experimental work with pastures and crops was extended and techniques improved and farm management studies commenced. Gradually the knowledge and scope of work of the Division extended and its worth received recognition. Since then it has lost some of its research activities to the Department of Scientific and Industrial Research, but has widened the scope of its extension work and service facilities.

WORK OF AN INSTRUCTOR IN AGRICULTURE:

The present work and problems of the Division may possibly be best explained by detailing the duties of an instructor in agriculture or fields instructor. The Division has a staff of 100 instructors and each instructorate covers about 1500 holdings. In districts such as Canterbury where seed certification is important, additional instructors and general assistants are provided and some senior instructors have assistants assigned to them for training. Further, a number of instructors have specialist duties in drainage, irrigation, machinery, seed production, farm training, and Y.F.C. work. In general, however, a senior instructor has to service 1500 holdings and is expected to divide his time into three parts:—one third for visits to individual farms, one third for experimental and other investigational work, and one third for general advisory work covering lectures, field days, demonstrations, "Journal" and newspaper articles, show exhibits, and Young Farmers' Club Work. In districts where seed certification is important, this becomes another major activity and even with assistance from technicians and general assistants it accounts for about a fourth of the instructor's time. Instructors in agriculture are concerned with four subjects, viz., soil management, crop and pasture production, and farm management. Their particular job is to gain local knowledge and keep abreast with general developments in the science and practice of farming. For local knowledge long district residence is essential and in keeping abreast in their professional work instructors are helped by the specialist staff of the Division and by conferences and special training schools. Recruits are placed for two years with a senior instructor and during this time they learn the Division's approach to extension work, to carry out field trials and to lecture and talk to farmers.

SOIL MANAGEMENT:

Soil management covers the whole range of soil fertility problems—fertilisers, lime, drainage, irrigation, and cultivation. It is an instructor's first duty to study local soil fertility problems and where necessary carry out field trials. The work is carried out in relation to soil types as named and classified by the Soil Bureau and the instructor is assisted in his work through specialist and service facilities of the Crop Experimentalist's Section of the Division, the soil testing service of the Rukuhia Soil Research Station, and drainage, irrigation, and machinery instructors. The Division over the past thirty years has built up a valuable fund of knowledge on soil fertility problems that has amply paid the cost involved. This is especially so in the information which has been collected on methods of developing marginal lands. Investigation and extension work on soil fertility problems must continue, for new problems continually arise and the work will need to go on indefinitely. Soil fertility problems are basic to extension work; they are local and can be solved only with very close liaison between research workers, laboratory services, and extension officers.

CROP AND PASTURE PRODUCTION:

Crop and pasture production (including seed certification) comprises the next major subject in extension work. Here again local investigational work is required and instructors are assisted by specialist officers from the Seed Industry, Crop Experimental, Agrostology, Engineering, and Economics Sections of the Division. Experimental and seed production work is linked with the activities of the Grasslands and Crop Research Divisions of the Department of Scientific and Industrial Research. It is the duty of the Extension Division to carry out field tests of new varieties and strains of pasture plants and annual crops produced by research stations, to multiply nucleus stocks of seed and distribute them, as well as to supervise commercial seed production through the Division's certification scheme. In addition the Division has assumed the responsibility of supervising all stages of turnip, swede, and maize seed production coming within certified or approved classes of seed. General work in pasture and crop production varies a great deal in the different districts. In the North Island pasture work, particularly pasture establishment and management on marginal lands, receives considerable attention, whilst in the South Island crop and seed production and seed certification are as important as pasture work.

FARM MANAGEMENT:

In farm management progress and methods of extension are not as clear cut as in soil management or crop and pasture production. The integration of soil, pasture, crop, and livestock management to secure maximum economic returns depends essentially on the managerial capabilities and determination of the individual farmer. The Division's work has advanced along the lines of selecting for study high producing and well-managed farm enterprises, analysing the management factors, and broadcasting the results by articles, lectures, and field days. The extension of successful farm management practices certainly offers the greatest scope for increased primary production. Very great increases could be secured if all generally well-managed farms could be raised to the level of the highest producing farms and all indifferently managed farms raised to the level of the well-managed ones (within the limits of local soil and climatic conditions). A great deal has been done in this direction during the past thirty years, but progress has not been as rapid as many of us wish. It is this known potential for increased production that often worries research workers and casts reflections on the efficiency of extension workers. Now I do not think there is any general lack of knowledge amongst farmers of what leading farmers in their districts are doing. The reasons for not following their lead are very diverse. Changes in farm ownership, inertia, ill-health, and lack of finance, labour, and materials may one or all contribute to lowering the level of management efficiency. General extension work and economic factors will gradually raise the level of farm management, but not as rapidly as farmers and the country desire. There is a widespread demand for more intensive methods of extension work in farm management and for instructors to define and supervise the management methods for individual or groups of farms. The Division has commenced this work, but lack of staff has not allowed it to be carried out on more than a pilot scale. Group extension work in farm management is costly and if developed the question arises as to who will pay for it. Will it be provided by the State, or by the appropriate sections of the farming industry, or by the individual farmers making use of the service? In the Franklin district a group of forty farmers have recently formed an incorporated society and have appointed their own farm management officer. He will work in close liaison with the Extension Division and receive assistance from State scientific services. Local organisation for intensive extension work in farm management has much to commend it, but haphazard develop-

ment of such groups not integrated with State and other extension services and divorced from scientific services should be avoided.

TRAINING OF INSTRUCTORS:

Any intensification of farm management extension, and this applies to extension work in other subjects too, will require an increased supply of competent instructors. The standard of recruits for extension work has worried us over the past decade, as also has the annual loss of experienced instructors who have left us for better paid work. There has been a great scarcity of properly qualified men and a reluctance of those qualified to take up or remain in extension work. We have had to fortify our staff with specialist instructors to help remedy this deficiency. We have drainage and machinery instructors, farm management research officers, agrostologists and agronomists, and farm forestry officers. An extension service certainly requires specialists, but I feel it would be both possible and desirable to have more thoroughly trained extension officers who need a minimum of help in keeping up-to-date in the science and practice of farming.

OTHER DIVISIONS OF THE DEPARTMENT OF AGRICULTURE.

Whilst the Extension Division, backed with its own scientific services and the soil and plant research sections of the Department of Scientific and Industrial Research, services farmers with information on soil management and crop and pasture production, the Animal Industry Division (linked with the Animal Research Division) provides somewhat similar services in animal husbandry. The Dairy Division's main activities cover the handling of milk and cream on the farm and the manufacture and grading of dairy produce. The extension work of the Horticulture Division is very similar to that of the Extension Division and its scientific services are provided by the Department of Scientific and Industrial Research and to a limited extent by the Extension Division. All Divisions rely on the Publications Section for dissemination of the written word and the New Zealand Journal of Agriculture, which is received by practically all farmers in the Dominion, has become a very powerful influence in extension work. The annual expenditure of the Department of Agriculture is about £2½ million and receipts about £¾ million. For the 1951-52 financial year the Vote Agriculture was expended as follows:—

Work	Expenditure	Revenue
Research or experiment	443,845	68,900
Advisory Services	540,030	43,700
Services (grading, etc.)	672,845	471,900
Control diseases and pests	943,975	104,300
Administration	243,555	
Herd recording (discontinued)	18,750	14,700
	<u>£2,863,000</u>	<u>£703,500</u>

The expenditure on advisory services for 1951-52 was roughly as follows:—

Work	Expenditure.
Animal husbandry	87,610
Horticulture	53,725
Apiary	6,240
Milk production	44,900
Manufacture of dairy products	37,980
Soils, pastures, and crops	103,955
Economics, farm management & home economies	13,850
Y.F.C. and C.G.C.	8,150
Show exhibits	8,020
Journal of Agriculture and bulletins	175,600
	<u>£540,030</u>

Local interest in agricultural extension work is stimulated if the work embraces not only the farmer but the farmer's family as well. In this we have recently followed the experience of other countries and fostered the work of the Young Farmers and Country Girls Club organisations and set up a section in home economics (Rural Sociology Section). We endeavour in as much of our lecture and field day work as possible to provide interest for the family as a unit and encourage the whole local community to have a day out and stimulate interest in better farming and better living.

FINANCE AND LAND IMPROVEMENT.

Through representation on the Land Development and Marginal Lands Boards the Department of Agriculture maintains liaison with the land settlement and development work of the Lands and Survey Department. This liaison has become closer since the Marginal Lands Board has been established and field officers of the Departments of Lands and Agriculture have co-operated in finalising plans for farm improvement work subject to Marginal Land Board finance. Finance is a factor, and usually a major factor, in determining whether improved farm practices are adopted. Vast sums will be needed for North Island hill-country improvement through oversowing and topdressing. Recent work on topdressing and oversowing selected tussock grassland in the South Island opens even larger vistas for land improvement. Even in the adoption of more intensive management methods on dairy farms some expenditure is usually necessary, and on all types of farms where improved practices raise the farm from a one-man unit to a two-man unit the provision of an extra house is often the chief hindrance to development. Knowledge of research and extension work defining the scope and value of improved farm practices must therefore reach much further than the farmer. Rapid improvement of the Dominion's farm lands, particularly its marginal lands, really demands that financial assistance should not be restricted to the cautious limits prescribed for what is now considered normal farming, but rather it should be expanded to cater for the development of more advanced farming. To achieve this end we must see that our extension advice on land and farm improvement is sound in every respect and to do this over an ever-widening field, research work in farm management and economics will have to be intensified.

METHODS OF EXTENSION WORK.

We have, as I have said, no Act which covers our extension activities, but we may profitably seek the help of an Act to further our discussion on the aims and methods of extension work. The Act of U.S.A. Congress (May 8, 1914) defines extension work as follows:— "Sec. 2. That co-operative agricultural extension work shall consist of giving instruction and practical demonstrations in agriculture and home economics to persons not attending or resident in said colleges in the several communities and imparting to such persons information through field demonstrations, publications, and otherwise." We may, I think, profitably spend a few minutes discussing the methods of extension, and elaborate on demonstrations, publications, and other methods of imparting knowledge and stimulating interest. Here we may again be helped and guided by some observations made by the United States Department of Agriculture, i.e., "If the practice is one that will benefit a large number of people, the agent must organise his use of extension means and agencies so that certain attitudes are developed in the minds of those he is trying to reach . . . Well-planned extension teaching therefore is based upon developing the following attitudes in the minds of the mass, namely (1) Attention, (2) interest, (3) desire, (4) confidence, (5) action, and (6) satisfaction."

ATTENTION, INTEREST, DESIRE.

I have already mentioned that we expect an instructor to spend about a third of his time in general extension work, i.e., lectures, field

days, demonstrations, writing articles, giving radio talks, preparing and demonstrating show exhibits, and furthering Y.F.C. work. All this work is necessary to attract attention and create interest and desire to adopt improved practices. Repetition and constant repetition is necessary. We find it desirable to complete as Journal articles a revision of all our subjects once every five years, and whilst these revisions do allow of the inclusion of new knowledge, the main object is to bring before the mass of farmers the best standard practices. This work, although it does not lead to much immediate action, does pave the way for action.

CONFIDENCE, ACTION, SATISFACTION.

On the other hand confidence, action, and satisfaction are local and personal attitudes. Confidence in the instructor is essential and local experiment and demonstration are usually necessary steps to building up confidence. Hence in our general division of the remaining part of an instructor's time we consider he should spend one third in co-operative experimental and investigational work and one third in visiting farms to give advice. We do not believe that an instructor is merely the link between the research worker and the farmer—handing on knowledge and reporting problems. He certainly has this duty, but he should also be an investigator of local problems and he must be able to demonstrate locally the value of new knowledge, methods, or materials.

PROGRESS OF EXTENSION WORK.

Whilst progress in extension work and the development of farming may not have been as rapid as many of us wish, I think if we look back over the past thirty years we will be rather amazed at what has been accomplished.

	Seasons	
	1921/22	1951/52
Land under occupation	43,500,000	43,200,000
Area under sown grass	16,000,000	18,000,000
Cows in milk	1,000,000	1,900,000
Total cattle	3,300,000	5,200,000
Breeding ewes	12,500,000	22,800,000
Total sheep	22,200,000	25,300,000

Research and extension work have played an important part in farm development, although progress has not been uniform over the whole of the Dominion. It has been most marked in the higher rainfall districts where the advantages of intensive grassland farming have been exploited. Knowledge is now available for much more widespread progress in the future and this would be assisted by a more intensive extension service. For this we require many more thoroughly trained men—men who will attract attention to and create interest in and a desire for the adoption of improved farm practices and gain the farmer's confidence and promote his action on the desired lines.