

PURE V. MIXED PASTURES FOR GRAZING.

It is not my intention to present a lengthy paper on the aspect of grassland farming which I have chosen, what I propose to do is merely to introduce the subject, then ask that it be fully discussed so that a definite policy may be arrived at for the guidance of farmers, agricultural instructors and seedsmen, who, from different standpoints are all deeply interested. I should like to trace as briefly as possible the history (British) of grassland farming.

A perusal of the available accounts of early British farming indicates that the practice was to crop the land till it no longer carried payable crops, then to leave it to restore fertility by resting. Nothing was sown on it and the 'natural' herbage was allowed to grow at sweet will. This natural herbage consisted largely of weeds, and this may account for the complete and thorough distribution and accumulation of weeds and weed seeds in British farm lands. These resting areas were not expected to carry stock,

The first reference to the futility of this system is found under the head of 'Four course rotations', when those practising such rotations noted that fallows which grew clovers gave better crops than those growing nothing or only weeds. This led to clover being cultivated as a fallow crop. The next step is easily imagined, especially as our continental neighbours had been investigating the matter -- that is, the utilization of fallow land. Artificial grasses were introduced and tried, and the practice quickly spread, until we find (and let us remember that it is probably less than one hundred years since the practice spread) that portion of the farm was sown in artificial pastures. I use the term 'artificial' advisedly, as I well remember when this term was generally used to designate pastures that had been sown with the fodder plants growing on them.

It is just fifty years since a systematic study of grasses in regard to habits, etc., was commenced by Stebler. At the same time work on the nutritive value, as estimated by the chemical composition, was started in Britain. In his introduction to a translation of Stebler's work published in 1889, Professor McAlpine states that few, if any, farmers know the names of the grasses which they grow or that there is any difference in grasses. He further stresses the importance of studying grasses from all angles in order to secure higher productivity in our pastures. At this period Perennial Ryegrass was the grass most generally sown; Italian Ryegrass was being used a little, and its use was spreading; Cocksfoot also had got a footing under many names, but of the other grasses little was known. Thanks to Professor McAlpine, M. T. Sutton, and others the knowledge of grasses and grass mixtures spread rapidly and a marked improvement in rotation pastures was the result.

I have heard Professor McAlpine many times state his arguments in favour of sowing mixtures of the well known grasses and clovers with those which are not so widely known. I propose to set out these arguments. By using a mixture, he said:-

- (1) Some of the plants are sure to suit the conditions
- (2) The grazing season is lengthened.-- by mixing early and late grasses, thus giving greater production.
- (3) The pasture has a higher nutritive value and greater palatability, {Good grasses increase the palatability of poorer grasses,} Mixtures give a better balanced food, therefore a food of higher nutritive value,

(4) A better sole is obtained, Top and bottom grasses occupy the surface better than any single grass.

(5) Better occupation of the soil is obtained by deep and shallow rooted grasses, which further pave the way for one another.

(6) The pastures last out better if the mixture is properly proportioned, as the more permanent grasses fill the gaps left by temporary types.

(7) Properly proportioned mixtures reduce the weeds on the farm by leaving no gaps on which weeds may grow,

These arguments hold good to-day, with the exception of the hit and miss recommendation in regard to some being sure to suit the conditions. With our better knowledge we can select suitable grasses? as has been done for many years.

It is not possible to trace how the unsatisfactory development in regard to pastures and pasture plants has been brought about. Farmers, like others, are fascinated by quick returns. The rapid growth of temporary types of grasses and clovers led to their indiscriminate use -- a happening which I have heard McAlpine predict and warn his hearers against. It is difficult, however, as we have all found, to control any practice which has become popular. This practise combined with other factors finalised our difficulties. The demand for grass and clover seed led to a new branch of farming -- saving of grass seed and clover seed. The seed grower as such is only with one thing, the production of seed, the greater the yield of seed the greater the cash returns. Naturally the growers selected or obtained high seed producing strains, not knowing that there was any difference from the pasture point of view. Seedsmen, also bought and sold what they got in ignorance of their true value. The practice of growing for seed did not in itself lead to disaster so long as pure stands were sown, but it was because mixtures were sown and harvested that deterioration has been so rapid in the last forty years. Prior to this mixtures were not used. Farmers soon appreciated the value of a mixed pasture for grazing purposes, but unfortunately followed the old practice of saving the first year's growth, or a portion of it, for seed, with the result which we now know. Not only did we get stemmy types as before, but hybridization took place and so quickly evolved and developed a mongrel and degenerate race.

I often feel myself that I may have assisted in bringing one well known seed growing area in Ireland into disrepute by advising thirty odd years ago the use of mixtures for grazing purposes, and failing to emphasise the fact that these mixtures could not be saved for seed, and that seed pastures must be specially treated. I may have been the unconscious **agent** in helping to bring about the downfall of this district as a seed growing area, but I do know further that the extra yields from the mixed sowings were the biggest factors. In many cases the growers deliberately mixed the seed **once** they discovered the possibilities in yield,

There was another blunder made by these British Pioneers which we in New Zealand would do well to avoid and that was the compiling and recommending of a standard mixture for use on every class of soil and under every condition. Naturally many unsatisfactory results followed and confidence in pasture mixtures was shaken, but so far as the British farmer is concerned the pasture problem has been more or less solved. One thing that does strike a visitor to that country is the excellence of the pastures on the better farmed areas. War conditions were largely responsible for the improvement. When stock were at famine prices and labour scarce the farmer concentrated on stock raising and pasture improvement, with the result that he

now knows which grasses and clovers grow best on his land, and the best proportions of each. to sow in a mixture,

Up to now I have dealt with the evolution of the mixed pasture in Britain. It is said that history repeats itself, and anyone might imagine I had dealt with the evolution of the New Zealand pasture, up to a point. -- that is, the improvement.

My experience of New Zealand pasture sowing dates back twenty four years. The practice up to that time was generally to sow down exhausted wheat land with perennial ryegrass, although in many cases the area was simply left to grow whatever came up. The rate of seeding and the quality of the seed were not always as good as they should be, but with the change over from wheat growing, and the advance of the fat lamb trade more interest was taken in pasture sowing. At my first acquaintance with New Zealand farming? temporary grasses and temporary types were the rage. Pastures to last three, four, and five years were sown either with Italian, or a fifty-fifty mixture of Italian and Perennial. The practice, I regret to say, arose largely through the misinterpretation of a report on the carrying capacity of Italian ryegrass in its first year issued by my predecessor. The effect on our pastures was disastrous. The poor carrying capacity in the second, third, and fourth year was disregarded; seed was saved from pure temporary types and mixed types, and this seed was sold and distributed as ryegrass. The farmers may have been primarily responsible, but I feel compelled to add that seedsmen and seed-dealers assisted in the debacle.

It is said that it is easy to start a rumour but hard to 'Scotch' it. We find it just as difficult to stem a practice which has any glamour about it, and we certainly found that the farmer was hard to convince that temporary grasses could not be used for pastures retained for more than one year. At the College in 1911 and 1912 areas were sown with various mixtures to demonstrate the point. In fact the 1912 sowing is still in existence. The complete or almost complete disappearance of temporary grasses in the second year and our published statement did help to convince many into recasting their practice.

Unfortunately the world war intervened and it had just the reverse effect on our pasture lands in New Zealand from what it had in Britain. New Zealand was dependant on her own resources for grass-seed and, in consequence the price of seed soared to famine level -- anything sold. Temporary grasses are high seed producers and gave the best yields, and were, of course, grown. The seed was saved, sold and distributed with the result now so well known. There were attempts at sowing mixtures, but even then seeding types were used. Cocksfoot went to a high price, -- labour was scarce, it was grown and harvested with a binder. On the plains where heavy seeding type gave the best returns, thus Cocksfoot came into disrepute.

In order to obtain better and more permanent types, farmers were advised to cut seed from old pastures, but little notice was taken of this advice. There are several reasons which may be offered for this non-observance. Fat lambs were selling at high rates; the old pastures carried more than the new swards, especially in summer; the yield of seed from old pastures is relatively low and is more difficult to harvest, and no extra price was offered for this old pasture seed. That is, the seed growers and seed merchants were not alive to the value of the seed.

At the College in 1920 it was decided to investigate grasses and a start was made in selecting types of Cocksfoot. Progress was slow, but we have succeeded in isolating a valuable strain of Cocksfoot, and we hope we have secured also a permanent strain of Perennial Ryegrass. Unfortunately this has taken almost twelve years, and, as the grower discovered his dilemma ten years ago and raised an S.O.S. Something had to be done then. He was told to use permanent instead of temporary types. The announcement by our authorities that a permanent type of ryegrass was being harvested in one district in New Zealand. was taken to imply that only this district produced permanent ryegrass. Demonstrations of its permanency in trial plots and the fact that these trial plots were sown with one grass only led to the belief popular to-day that pure sowings are best. If this fallacy is not scotched we shall land in the same position as our British cousins were in forty years ago. The pure pasture craze will develop, and result in a reduced production, as permanency does *not* necessarily secure higher yield, especially if only one type of plant is growing.

I feel I am not overestimating the seriousness of the position; I look to a definite pronouncement from the Grassland Conference. Farmers are looking for guidance. Seedsmen and stock and station agents who are sponsors to the farmer. are also seeking enlightenment. I would like to make the following points clear to them,

- (1) Permanent grasses do not necessarily make good permanent pastures unless (a) They are of proven high producing strains.
 - (b) Have a high feeding value.
 - (c) Are disease and drought resistant
- (2) Different strains may suit different areas, and confine themselves to definite areas. Any one strain or group of strains cannot possibly suit all types of land.
- (3) Poor pastures (1) will not increase production -- their growth will be seasonal.
 - (11) Will lack palatability and feeding value
 - (111) Are more likely to be affected by climatic conditions.
- (4) Mixed pastures have all the advantages claimed for them forty years ago by Professor McAlpine.
- (5) Do not Judge pastures or pasture plants on their appearance. The worst pastures and plants often meet the eye best because no animal will eat them.
- (6) Pasture establishment for grazing and seed production should be clearly defined and treatment suitable to obtaining best results from either prescribed.

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Mr. J. W. Calder will follow with a discussion on grasses and mixtures suitable to the district with which he deals.

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