

GRASSLAND FARMING IN NEW ZEALAND

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ITS POTENTIALITIES AND LIMITATIONS

Summary of paper read before the New Zealand Grassland Assn., Fourth Annual Conference held at Christchurch, August, 1935.

By G. H. HOLFORD, (B.Sc. Agric.)
Advisory Officer, Imperial Chemical
Industries of A. & N.Z. Limited.

The marked developments in Grassland Investigations, particularly since the War - and with special reference to the British Empire - were briefly reviewed.

The great importance of grass as a "crop" was emphasised.

The subject matter of the paper was discussed under two main headings :

1. From the "extensive" standpoint, when a survey was made of the principal grassland areas of New Zealand, illustrated by suitable maps.

Figures were stated showing that of the 33 million acres under grass in New Zealand, approximately half had been sown by man, and, of this half, 6 million acres were devoted to dairying. On some 70,000 holdings of pastoral and mixed farms, grass was the predominating "crop". A plea was made for an extension of the mapping of the grasslands area of New Zealand so that the problem of grassland potentialities could be better focussed at future Conferences. Indications were given that in future the policy to adopt should be "more efficient farming on the more efficient acreages" of grassland.

2. The principal part of the paper dealt with the "intensive" aspect of grass production in New Zealand. Charts were exhibited showing grass production over New Zealand, indicating that 70% of the production was secured in approximately four months of the year.

The desirability of spreading pasturage yield over as long a period of the year as possible was stressed. Factors in which this could be considered on, individual farms was illustrated by means of a model bridge. Reference was made to the fact that each individual farmer's problem was to bridge, in the most economical way possible, the gaps in stock feeding during the periods of usual pasture scarcity, e.g. late autumn, winter, and early spring.

A bridge, comprising twelve planks of the main factors to be considered in securing maximum production of grass over the year on any individual farm, was exhibited, the principal points in each plank being as follows :

DIAGRAM A.

PLANK 1. NATURAL SOIL.

This is the fundamental basis, and as it varies naturally, so will the natural or induced cover vary. The

main factors involved are :

- (a) Type - whether sand, clay, or loam;
- (b) Class - whether light, medium, or heavy;
- (c) Amount of humus;
- (d) Amount of moisture it can hold;
- (e) Nature of the sub-soil;
- (f) Climate and rainfall;
- (g) Topography, and,
- (h) Natural cover - whether bush, fern, tussock, or swamp.

PLANK 2. SOIL AMELIORATION,

Natural soil may be ameliorated or improved in such ways as :

- (a) Clearing;
- (b) Draining;
- (c) Cultivation;
- (d) Liming;
- (e) Addition of organic matter;
- (f) Provision of Shelter;
- (g) Irrigation.

Brief reference was made to the effect of irrigation in securing pasturage in the drier months of the year in irrigated areas.

PLANK 3. PASTURE ESTABLISHMENT.

Factors dealt with in this connection were :

- (a) Preparatory cultivation, including consolidation; - stress was laid on the importance of consolidation in the establishment of pastures on the lighter soil types of New Zealand.
- (b) Building up of fertility; - the importance of building up fertility prior to sowing grass on the lighter soils was also stressed.
- (c) The relative merits of sowing grass seed
 - 1. Broadcast, and
 - 2. By drilling,

were put forward.

PLANK 4. SEED MIXTURES.

It was contended that the trend in recent years had been from the complex to the simple in seed mixtures; this has been brought about by the stock-management factor, Brief reference was made to the factors-to be considered in compounding seed mixtures, namely., those dealing with length of ley, seasonal growth, pasture varieties, proportions of varieties in mixture, amounts to SOW, etc.

PLANK 5. POSSIBILITY OF MIXTURES OVER THE FARM.

The desirability of having simple mixtures of the grass/clover type over the farm, rather than having a complex mixture in each paddock, was emphasised. It was pointed out that such a practice would simplify stock management and would provide seasonal needs of stock in a

desirable direction. Some of the simple grass/clover associations suggested were :

- (a) Ryegrass/White clover;
- (b) Ryegrass/Montgomery Red Clover;
- (c) Cocksfoot/Montgomery Red Clover;
- (d) Cocksfoot/Subterranean Clover;
- (e) Paspalum/Subterranean Clover;
- (f) Paspalum/Ryegrass/White Clover.

The "sociability" of pasture varieties was also briefly discussed and the places for pure pastures of such herbage plants as Italian, Red clover, Prairie grass, and Cocksfoot. The question of making greater use of simple mixtures over the farm had been advocated by the writer since 1919.

PLANK 6. STRAINS.

The question of strains in grasses and clovers as an important factor in getting maximum returns from grassland was also indicated, along with such matters as certification and palatability of the various strains.

PLANK 7. TEMPORARY PASTURES.

That there is today a strong case for more temporary pastures in grassland farming was emphasised, such pastures providing valuable feed at important periods and tending to prevent over-grazing of the permanent swards. A method adopted by some farmers of re-seeding Italian ryegrass without cultivation was referred to, as well as the importance of temporary pastures, not only in providing grazing, but in the securing of ensilage and hay.

PLANK 8. SAVING SURPLUS GROWTH.

The need for more attention being paid to the saving of surplus growth in the form of ensilage and hay was stressed, along with the desirability of early cutting of these crops to get a high quality produce. A modified plan of alternate pastures and meadows, to suit certain dairying districts in New Zealand, was put forward, based on the fact established at the Aberystwyth Plant Breeding Station in Wales, that grass is earlier the following Spring after hay and aftermath, than after grazing. It was suggested that in the first year after the hay crop the paddock should be allowed to go for winter and early spring grass, and the following year ensilage and hay should be fed out on the paddock, which would then be saved as a hay crop.

PLANK 9. GRASSLAND MANAGEMENT.

It was pointed out that grassland management involved skilful defoliation of plants to secure the maximum feeding value with adequate periods of rest. The principal factors to be considered in grassland management, so as to get maximum yields from pasture over the year, were outlined. The principal points in stocking just after establishment, and the main factors to be considered in

rotational grazing, degrees of intensity of grazing, the importance of having a certain leaf growth on pastures at certain times of the year - particularly those that have to produce "out-of-season" grass - were strongly stressed. A brief outline was given of the experiments carried out by Mr Martin Jones at Jealott's Hill, in connection with "playing a tune" on the pastures, or how grazing alone can alter the characteristics of a pasture. Brief reference was made to such factors as mowing and harrowing in grassland management.

PLANK 10. TOPDRESSING WITH PHOSPHATES, POTASH, & LIME.

The main points in connection with topdressing with Phosphates, Potash and Lime, were outlined, with special reference to applications at various times of the year so as to extend growth over the periods of pasture scarcity.

PLANK 11. THE USE OF NITROGEN.

The judicious use of nitrogen as a factor in grass production was then discussed. Reference was made to nitrogen as an aid in maintaining the grass/clover balance, in grading up swards, in extending autumn growth, in producing winter and early spring grass and in producing greater yields of ensilage and hay. Nitrogen was considered as a "labour-saving device" inasmuch as it minimises the need for supplementary crops. It was also discussed as a "protein-grass-feed-bag" in the paddock, as "out-of-season" grass minimised the need for protein concentrates such as 'oil-cake.

PLANK 12. THE GRAZING ANIMAL AS A DETERMINING FACTOR IN PASTURE-BRIDGE BUILDING ON EACH FARM.

The fact that the animal was the determining factor, gauging the success of all the other planks, was emphasised. In considering grass potentialities and limitations it was stressed that consideration must be given to the class of stock - cattle, sheep - their condition (whether wet or dry) also times of calving or lambing. The concluding observation on this aspect of bridge-building in regard to pastures was that each grassland farmer has to build a pasture-bridge to carry stock over the year and he must consider all the factors mentioned, not only singly, but in relation to each other, and then build his bridge with the materials available on his farm,

DIAGRAM B.

Another model indicated that where - through lesser grassland intelligence or adverse climatic conditions - it was not possible to grow grass over a sufficient period of the year, resort must be made to supplementary crops as a pillar to support the pasture bridge carrying stock over the year.

GRASSLAND INTELLIGENCE. Stress was laid on the importance of grassland intelligence, which determined the relationship of all the other factors discussed. It was considered that this grassland intelligence could be built up by grassland studies in schools, which had already been approved of by the Education Dept., by grassland studies by members of Young Farmers' Clubs, and by the dissemination of sound information combined with practical experiences of the farmers themselves.

GRASSLAND BRIDGE

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"To investigate the problems of grassland is to be an engineer . . . Grassland management is just bridge-building—good engineering and nothing more."

States Professor Stapledon,
Director,

Welsh Plant Breeding Station,
Aberystwyth, Wales.

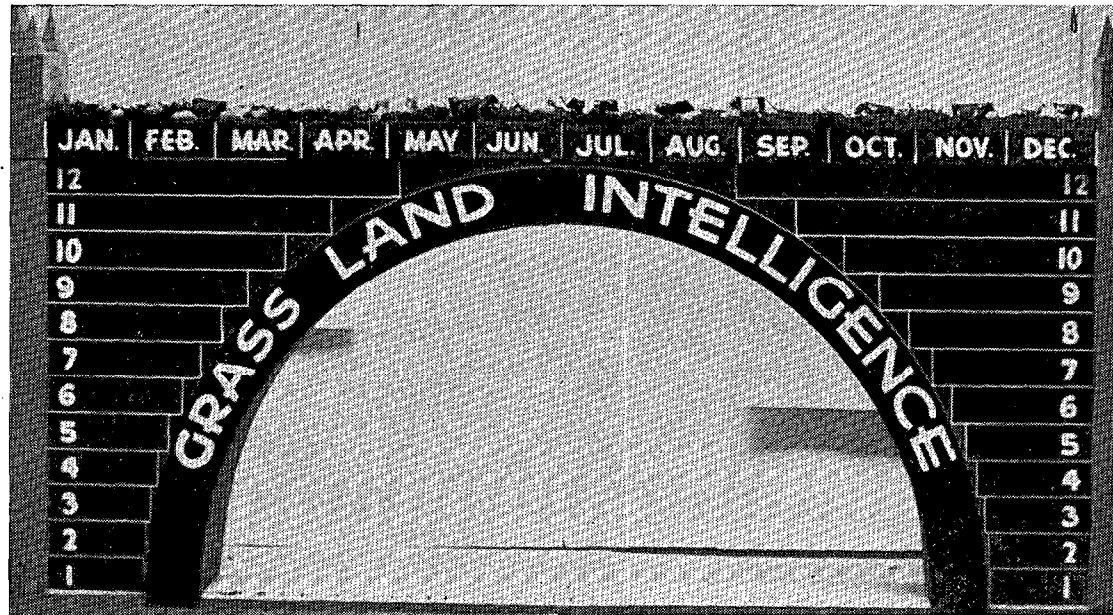


Diagram A.—This represents in bridge form the factors that should be considered in endeavouring to make grass on the farm carry the maximum stock over the whole year.

The main planks in this are—

- | | |
|--|--------------------------|
| 1. SOIL Natural | 7. TEMPORARY PASTURES . |
| 2. SOIL Ameliorated | 8. SAVING SURPLUS |
| 3. PASTURE ESTABLISHMENT | 9. GRASSLAND MANAGEMENT |
| 4. SEED MIXTURES | 10. TOPDRESSING-MINERALS |
| 5. MIXTURES OVER THE FARM | 11. NITROGEN |
| 6. STRAINS | |
| 12. THE ANIMAL as the object for which all other factors contribute in the way of feed supplies. | |

The central arch—GRASSLAND INTELLIGENCE—co-ordinates all the above factors and determines the inter-relation of each to the end of maximum returns from pastures: This arch is best represented by a laminated structure built up by (a) grassland studies in schools, (b) boys' and young farmers' clubs, (c) adult education.

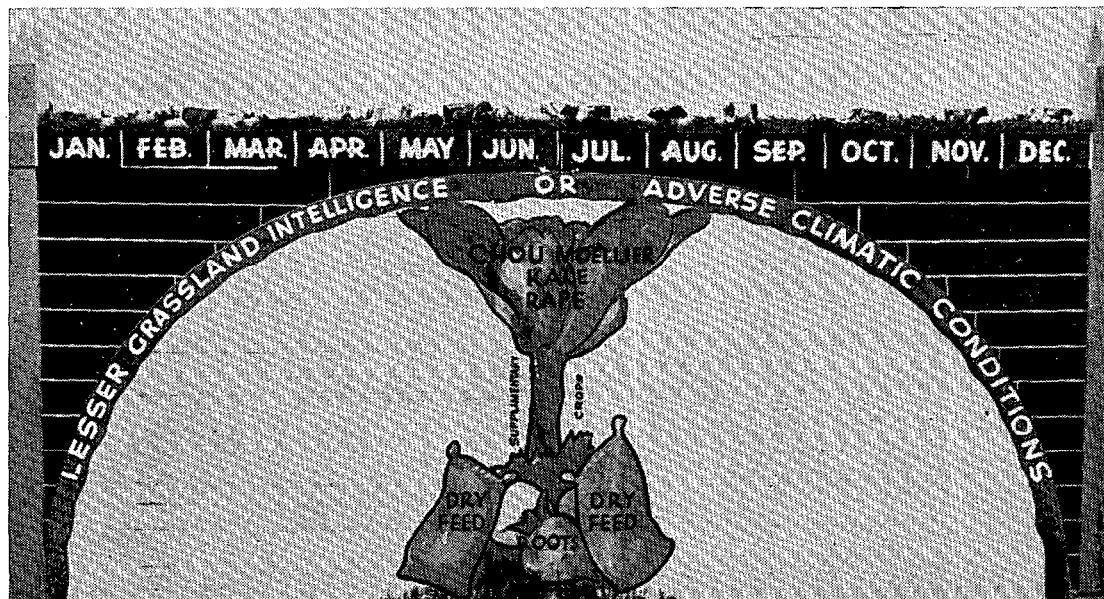


Diagram B.—This represents conditions where factors are not favourable for grass to carry stock satisfactorily over the year. The narrower and wider arch—due mainly to lesser grassland intelligence and/or adverse climatic conditions—is insufficient to maintain carrying capacity without resort to a central supporting pillar of supplementary crops—e.g., forage crops, dry feed, or roots.