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PRODUCTION OF BRASSICA SEEDS.J. W. HADFIELD, Plant Research Station, Palmerston North.

The title of my paper may be somewhat misleading in that I do not intend to discuss how to produce Brassica seeds, but rather why we should aim at their production in New Zealand in the interests of farming in general and grassland farming in particular,

Farming in New Zealand is characterised by the overwhelming importance of her grasslands. So important are they that the history of their development, and the marketing of their products, has been the history of the development of the Dominion.

In a direct attempt by the farmer to equalise his seasonal carrying capacity he has resorted to hay, silage, and supplementary crops, to the application of phosphates more gradually over the season and the use of nitrogen to induce the growth of out-of-season grass, and he has changed the nature of his stock by increasing very materially the proportion of breeding ewes and cows in milk.

Supplementary forage crops have played, and are playing, an important part in permitting the full utilization of these pastures, and they serve as a link, and sometimes an indispensable link, in the chain of production from one season to the next.

About 821,000 acres are devoted annually to supplementary fodder crops to which must be added a very large proportion of the autumn sown cereal crop, especially the oat crop in the North Island, which is fed off and subsequently cut for chaff,

The most important of these crops are to be found in the genus, Brassica, and they comprise 680,000 of the 821,000 acres, or 83% of the total. Valued roughly on cost of production the Brassica crops will be worth about three million. They are therefore of significant importance in New Zealand and the introduction of the subject in a grassland conference needs no apology,

The seed required for the sowing of this large acreage is virtually all imported either from Great Britain or from the Continent of Europe through Great Britain.,

In 1934, 568 tons of Brassica seeds valued at £37 000 were imported, were this seed produced in New Zealand a trade would be established considerably exceeding in value that of White clover, or Cocksfoot or Brown top, and equivalent to about one-third of the Ryegrass seed crop of New Zealand.

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From this aspect alone such a trade would be well worth fostering, yet I believe that it is from the trade viewpoint that we are likely to meet with the greatest obstacle to its establishment.

There is a profitable trade in the importation of Brassica seeds and one that is not beset with great difficulties since most of these, such as germination and varietal purity, will have received attention by the exporting houses. We cannot therefore expect merchants to be very enthusiastic in any scheme which will upset such a trade and place upon their shoulders the burden and responsibilities attending the growing of seeds on contract and the maintenance of high quality, varietal purity, and continuous and assured supplies. Moreover, as merchants have pointed out to me, these imports so conveniently counterbalance the purchase of New Zealand seeds by Great Britain. The position might be different were we able to produce these seeds in New Zealand more cheaply than they can be imported, but considering the circumstances under which much of the Continental seed is produced, this could hardly be expected.

We may therefore surmise that the production of Brassica seeds in New Zealand is not likely to be established by the Seed Trade in general, they having already well-established trade connections,

It seems to me that the only way to overcome this apathy is to create an atmosphere in which the farmers of the Dominion will demand New Zealand grown seed so that the vendors would then in their own interests have to fall into line with this demand. My argument, therefore, centres round the reasons why our farmers should, in their own interests, demand New Zealand grown seeds.

1. My first point will be to draw attention to the limitation of turnip growing owing to club-root, which is frequently most severely felt in those districts in which turnip growing is of paramount importance. We know that certain varieties are said to be club-resistant, but such resistance seems to be largely a strain characteristic, and in such a variety certain strains may be resistant and others not. Morphologically there is no means of distinction, so that the importer and the grower are at a disadvantage in not being certain of the status of resistance in any particular line. Certain lines of Hennings have exhibited far greater resistance than others., Bruce and Wallace are indistinguishable from Purple Top and Green Top Yellow Aberdeen respectively, and we know that lines of Bruce and Wallace have been imported possessing very little resistance. If we view that resistance is an essential feature of Bruce and Wallace, then, when they do not show this resistance, they may be regarded virtually as merely Purple Top Yellow Aberdeen and Green Top Yellow Aberdeen.

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The only practical means of ensuring that our growers receive genuine club resistant strains is to produce these in New Zealand under certification. Their use, in association with sound practice in rotation and manuring, would, to a large extent, control the menace of club-root.

2. My second reason is almost parallel with the first, Dry-rot has been a serious limiting factor in swede growing and is responsible for the swing away from swedes to yellow-fleshed turnips. It has been demonstrated that dry-rot infection may be carried with the seed, and that on occasions imported seed is very highly infected. It is obviously unwise therefore to distribute such highly infected seed, but the only practicable method of controlling such distribution is by means of certification and this, in turn, implies the production of such seed in New Zealand. Just as in the potato crop we refuse to certify those lines carrying more than a certain degree of virus, so in swede seed would we permit into certification only those lines carrying a minimum of dry-rot infection: and, just as in potato certification we have been able to raise the limit of infection of Aucklander Short Top to below 2% we may hope eventually to reach the objective in swede seed and distribute only seed free of infection,

Such an objective seems not impossible of attainment. Mr. John Hunt of Pembroke has been growing swede seed for many years, and I think I am correct in saying that no dry-rot infection has ever been found in seed from his farm. There are many difficulties in this objective, but I venture to say that all of them would be more easily overcome had we some control over the seed production end such as is possible under certification.

3. Passing now to the rapes and kales, we find here a chaotic state in varietal nomenclature. For, example, Buda kale that was being imported into New Zealand a few years ago was of two kinds., Neither was, like the Buda kale that was at one time so popular in the North Island, and one was Broad Leaf Essex rape sold under the name of Buda kale., There were also two kinds of rape-kale which caused confusion, and one was very unsuitable and caused serious loss to some sheep breeders.

Rape is imported under several varietal names, but these names are no indication of type. Thus 120 samples of rape under trial were branded with various names. Of three called Giant, two were Broad Leaf Essex, and one too mixed to identify, but not one was Giant, Fifty-nine samples of Broad Leaf Essex proved to be correctly named in 28 cases; 17 were Giant, 6 swede-like rape and 8 too mixed to identify. Forty-two lines were not specifically named and 11 of these were Giant, 18 Broad Leaf Essex, 1 swede-like rape, and 12 mixed. The same position obtained in Kangaroo and Colonial rapes.

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There are at least three types of rape distinct in habit, maturity, palatability, yield and fattening qualities; each probably has its own sphere of economic utilisation, but we can never hope to correct the position except by seed production under certification,

4. My last reason will have a direct appeal to those research workers who are engaged in the breeding of Brassicas. Their objective must in all cases be the commercialisation of their efforts but they have little prospect of attaining this unless there are growers prepared to raise the seed commercially, and merchants who are willing to contract for its production. Moreover, certification would be essential as a means of controlling distribution;

These four reasons afford sufficient evidence I think of the desirability of producing our own seed in New Zealand, but we have yet to discuss the practicability of doing so.

The first and most obvious question is whether it would pay. Economic production in competition with cheap Continental and Japanese seed may not seem possible, but it must be realised that the seed produced in New Zealand, in the initial stages, would be seed of some special merit, such as disease resistance or purity, and would therefore command a high price for that very reason. With increased production and therefore experience, methods would improve, and the cost of production lowered. The point is that we need not at this juncture consider seriously competition with low priced seed, and under those circumstances I am of the opinion that it could be made profitable. I am not suggesting that fortunes are awaiting those who venture, but with good yields and good prices the prospects are for a substantial profit.

The second question is that of quality. It must be acknowledged that there is a prejudice against the use of New Zealand seed, but I may point out that New Zealand grown swede and turnip seed has received repeated trials during the last four years and it has, with, I think, two or three exceptions, proved equal to and in many cases superior to imported seed. This superiority has largely been due to superior germination. We have circularised the users of New Zealand grown seed, and they have nothing but praise to offer. Growers and merchants may rest assured that they are well protected under the complete system of trials for varietal purity, disease resistance, and disease infection, to which the seed is subjected prior to its certification,

Finally there is the problem of continuity of supply. Brassica crops are subject to extreme variation in yields in response to seasonal conditions. This is a

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difficulty that will attend this, as it will the initial production of any other seed, and the difficulties and uncertainties disappear only as advancement is made.

My object in reading this paper is to appeal to you who are interested in grassland farming to interest yourselves also in the production of New Zealand certified Brassica seeds. It is in your interests, and in the interests of farming generally, and you can help by clearing away any misunderstanding that may be in the minds of farmers and merchants, and by drawing their attention to the benefits that are likely to accrue.