

RED CLOVER SEED DAMAGED BY FAULTY THRESHING

In the past New Zealand red clover seed has been held in high esteem in overseas markets on account of its consistent good quality. Unfortunately, the high standard is not being maintained. With increasing frequency, English buyers are complaining of the unsatisfactory purity and germinating capacity of red clover seed imported from this country. The reason for the deterioration in quality is the growing prevalence of damage resulting from faulty threshing.

THE causes of threshing injury and the precautions which should be taken to minimise it have been dealt with by Mr. S. H. Saxby in an article in the "Journal of Agriculture," November, 1941. There remains, however, widespread misunderstanding as to the nature of threshing injuries, and as to the way in which injured seeds are dealt with when the seed is tested.

Invisible Damage

The general appearance of a badly-damaged sample may be very good, for the injuries caused by heavy threshing

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are not conspicuous. Upon close inspection of a sample a few chipped seeds may be detected, but these represent only a part of the damage that is done. In many seeds internal fractures are produced which are not visible, but which result in the seedlings breaking into pieces during germination. Other seeds again are merely bruised. These may germinate normally while fresh, but they do not retain their vitality for as long a period as seeds which have not been roughly handled.

Testing

When testing samples of red clover seed, the pieces of broken seeds are removed as impurities, and classified with other rubbishy material as "inert matter." Chipped and cracked seeds are also classified as "inert matter" if they are injured in the region of the root or the base of the seed-leaves, and are obviously incapable of producing useful seedlings. On the other hand, seeds in which only the upper parts of the seed-leaves are chipped or cracked are not regarded as impurities, for they may produce seedlings which, although weakened, are not entirely useless. The manner in which the chipped seeds are classified in the purity analysis is illustrated in Fig. I.

The presence of an excessive proportion of chipped seeds renders a line of red clover seed unsuitable for the export trade and may exclude the line from certification. The standard of purity required for certification, in the case of red clover seed, is 96 per cent. Of the red clover samples tested during the first ten months of the current year, 46 were below this standard. In 37 of these samples, the principal impurity was chipped seeds.

Broken Seedlings

The greater part of the damage caused by heavy threshing becomes apparent only when the seed is tested

for germination. In the germinator many seeds which appeared to be sound produce useless broken seedlings. These broken seedlings come from seeds in which the dry, brittle embryo has been fractured. Often the fracture does not extend to the more leathery seedcoat, and in such instances the injury cannot be detected, even by a careful examination of the seed.

Broken seedlings are of no value, and are not included in the germination counts. Commonly, the seedling falls into two or three separate pieces. In some cases, only the tip of the root is broken off the seedling. The root then fails to grow normally. Side roots may develop from the stump after some days, and when this happens the seedling may survive if conditions are very favourable, but under field conditions such seedlings are worthless.

Conclusions

The damage caused by faulty threshing cannot be repaired by machine-dressing. The smaller pieces of broken seeds are removed by the machines, but most of the chipped seeds and all of the cracked and bruised seeds remain in the dressed line. Repeated dressing may increase rather than decrease the proportion of chipped seeds in a heavily-dressed line.

The solution of the problem is in the hands of those who supervise the threshing of the seed. The header harvesters are especially prone to damage the seed, but by constant attention to the machines, much of the trouble can be prevented. A close watch should be kept to see that seed is not being broken, and it should be borne in mind that even if only a small proportion of the seed is broken, much additional, though less conspicuous damage, is being done.

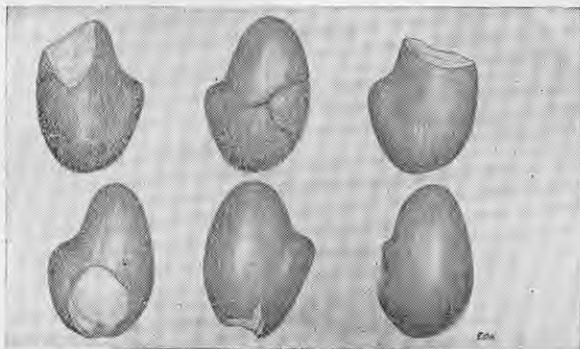


Fig. I.—Broken seeds from a heavily threshed sample. Upper row: Seeds not classified as impurities. The injuries affect only the seedcoat and the upper parts of the seed leaves. Lower row: Seeds classified as "inert matter." The injuries affect the root and the base of the seed leaves. These seeds cannot grow.

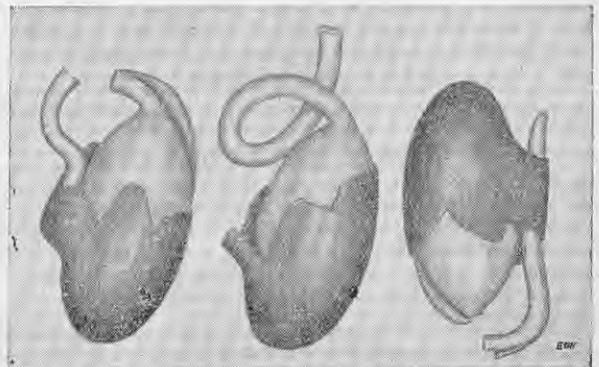


Fig. II.—Broken seedlings from seeds cracked by heavy threshing. Such seedlings are not included in the germination counts. Left and right: Seedlings broken near the base of the seed leaves. Centre: Seedling with the growing tip of the root destroyed.