

Apparent density: This refers to the density not of the individual seeds, but of the seeds together with the air-spaces about them just as they naturally lie in bulk. The principle involved can well be represented by a box of small shot and a box of larger shot made of the same material. Placed on the scales it will be seen that the small shot weighs heavier than the larger size. The reason for this is that in the case of the small shot the sum total of the air-spaces is less than in the case of the larger shot. This fact can be easily proved by filling the air-spaces in each case with water and pouring it off into a measure. It will therefore be seen that small seeds show a greater apparent density, and consequently a greater bushel weight than large seeds. Thus certain Hawke's Bay ryes show bushel weights greatly increased merely on account of the small size of their members, while certain Canterbury ryes are lowered in bushel weight largely on account of the greater size of their members. When, as in the case of some Hawke's Bay and other lines, the true density of each seed has been increased by the removal in the dressing of as much of the chaff as possible, and the apparent density is also high by reason of the small size of seed, very high bushel weights are sometimes obtained—as much as 40 lb. per bushel.

The influence of the apparent density upon the bushel weight of seeds is very frequently quite overlooked. To a large extent the popular view is that seeds of a heavier bushel weight are relatively better than those of a lighter bushel weight because the former indicates that the kernels of the seeds are well developed, and as it is the kernel that has to grow there is some assurance that seeds of a high bushel weight will be of good germination capacity. Moreover, large seeds are perhaps rightly believed to produce large and vigorous plants. Such a conclusion is often formed entirely with the idea that bushel weight is purely an indicator of true density; it pays no regard to apparent density, which may greatly negative the high results arising from true density.

A conclusion of this kind is in some cases accidentally true, but in others quite erroneous. Were it not that we have many seed-sellers of undoubted repute the bushel weight of seeds in quotations would generally be of doubtful value. When the germination capacity is not quoted it therefore behoves every buyer, where possible, to inspect or have inspected a sample of the seed offered, if for no other reason than to ascertain that the bushel weight quoted is not in reality obscuring undesirable qualities, such as small immature seeds, heavily dressed. If, however, the seeds are somewhat small but plump, as in the case of most Hawke's Bay rye-grasses, then despite heavy dressing they are probably excellent seeds.

Concrete for Small Sheep-dipping Plant.—On page 9 of the *Journal* for January last were given the quantities of concrete required for the dip and draining-floor of the one-man sheep-handling plant recommended by the Department. A correspondent writes pointing out that the information would be more useful to the average farmer stated in terms of the quantities of the different materials required for the job. These are approximately as follows for a 1-2-6 mixture: Cement, $5\frac{1}{2}$ barrels of 376 lb., or 17 bags of 124 lb.; sand, $1\frac{1}{2}$ cubic yards; gravel, $4\frac{1}{2}$ cubic yards.