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Bulk handling of superphosphate

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A MAJOR factor in our agricultural production is the outlay for fertilisers, including the cost of their application to the land. Any means which can be employed to reduce these costs are therefore of extreme importance to the State's agriculture. The bulk-handling of fertilisers could be one way of reducing these costs to the farmer.

The transport of superphosphate in bulk is not new, as an investigation into its possibilities was carried out in 1951 by the Department of Agriculture in association with Co-operative Bulk Handling Ltd. This was initiated because of a steep rise in bag costs which rose from 39s. 2d. to 69s. 6d. per dozen or nearly £3 10s. per ton of fertiliser.

Two successful demonstrations were held at Cunderdin. Grain-handling machinery specially adapted for the purpose was used and the results indicated that, with modifications, little difficulty would be ex-

Fig. 1.—Prototype bulk fertiliser unloader used in 1958 demonstrations. This machine used an endless rubber belt and "Clark" shovel.
experienced with the actual mechanical handling of the superphosphate. A major disability at the time was the lack of handling and storage facilities on the farm. The results were published in the Departmental Journal for December 1951.*

Possibly as a result of a drop in jute prices, the matter received little attention between 1951-1958, and no further planned investigations were carried out. However, during this period one or two farmers did obtain some of their superphosphate supplies in bulk. From their experiences it seemed clear that while considerable savings could result from bulk transport, the carriage of bulk super by rail was not a practical proposition on account of the unavailability of suitable unloading equipment.

In 1958 further consideration was given to bulk-handling, in particular to that portion required for top-dressing which could be applied to the paddocks in the summer-autumn period before cropping was due to commence.

Various authorities representing the Government as well as superphosphate manufacturers and users were associated with demonstrations at a number of country centres late in 1958. The prototype equipment used was loaned by Messrs. Cuming Smith & Mount Lyell Farmers Fertilisers Ltd. who had collaborated in its design.

The machine, which was easily transported behind a car or utility, consisted of a portable belt elevator to which was attached a "Clark" shovel for unloading the rail truck. The machine worked quite satisfactorily, the fertiliser being transferred expeditiously from truck to wagon. One of the motor trucks used was equipped with a bin to which there were special attachments for spreading the fertiliser and emptying the truck. This outfit had already been operating satisfactorily in the Boyup Brook area.

It is of interest that two of the belt type loaders were in operation during the year. The ease of operation of this machine is quite clearly shown in the illustration (Fig. 1) which shows the unloading of the superphosphate from the rail truck into a bulk motor wagon.

In 1959 a new type of bulk loader, based on the prototype machine used in 1958, was demonstrated at six centres, Kojonup, Dumbleyung, Beverley, Corrigin, Cunderdin and Wongan Hills, during the first part of December.

All the demonstrations were very satisfactory and showed quite clearly that superphosphate could be easily and expeditiously transferred from rail to motor truck. The loader or "unloader," using a

chain of buckets, was some improvement on the previous type which used an endless belt. Loading was simpler and less space was required which could be important in some situations. This outfit is also easily pulled behind a car or utility.

The operation of the machine is clearly shown in the accompanying illustrations (Figs. 2 and 3) taken at the Beverley and Wongan Hills demonstrations. They indicate the ease with which the fertiliser was handled by the elevator and the attached “Clark” shovel. At the demonstrations 4 tons were transferred in under 20 minutes.

The motor truck used in conjunction with the unloading was the one used in the Boyup Brook area and previously referred to. The illustrations (Figs. 3, 4 and 5) show the attachments to the truck to provide not only for the actual broadcasting of the superphosphate, but the even removal from the bin. The close-up shows the scraper bars attached to chains which drag the material to the rear of the truck where it is directed to the spinner by two spiral feeds. These two attachments are driven off the truck wheel, whereas the spinner itself is driven by a small engine.
mounted on the rear of the truck shown in the photographs of the actual topdressing operation.

These demonstrations showed that one of the main problems of bulk-handling, viz., the transfer from rail to motor truck, had been solved and that it was possible for a farmer to have the topdressing of his pastures carried out expeditiously and economically. The costs quoted at the demonstrations for such contract work would be on the basis of 10s. per ton for the first 10 miles and 1s. per ton mile over 10 miles for cartage, plus 2s. per acre up to ½ bag to the acre and 2s. 3d. over that quantity, for the actual topdressing. These rates are on a par with normal contract prices for bagged deliveries.

Possibly as a result of increased interest in and usage of bulk superphosphate, these charges have dropped somewhat. Latest quotations are 7s. 6d. to 8s. 6d. per ton for the first mile (includes unloading charge); 1s. per ton mile for the next seven miles and 9d. per ton mile, subsequently. Spreading charges are quoted at 1s. 6d. to 1s. 10d. per acre for rates of 90 to 120 lb. per acre of fertiliser.

The price quoted at the demonstration for the loader was £600. The outfit could be used for the handling of other materials in bulk such as wheat and other grain, lime, sand, gravel, etc.

The price per ton for superphosphate (ex works—less 5s. per ton for cash) at the time of the 1959 demonstrations was:

- £12 13s. per ton in new bags.
- £11 13s. per ton in farmers' bags.
- £11 4s. 6d. per ton in bulk.

These showed a difference of £1 8s. 6d. in favour of bulk against new bag lots and 8s. 6d. using farmers' own bags. With new bags the value of the bags for refill and other purposes must be considered.

The major advantages in the bulk-handling of superphosphate are:

1. It is possible to have fertiliser delivered and spread for approximately the same cost as for bagged super delivered. There is a saving roughly equal to the cost of topdressing.
2. Bulk super is better for long term storage. Bag losses are reduced. Bulk heaps or inexpensive rough timber bins with galvanised iron covers store better than bag heaps, and cost less per ton. Cropping requirements could be obtained early, thus avoiding possible delays at seeding time.
3. Bulk superphosphate is more suitable for aerial topdressing. Usually relatively large quantities are required at one dump.

Fig. 5.—Rear view of top-dressing truck showing engine driven spinner type spreader.
At the present time the greatest application for bulk-handling appears to be in relation to the topdressing of pasture lands. This work is normally carried out during the early part of the year, before cropping commences. With the availability of suitable handling equipment, and efficient operators doing the work by contract, this important phase of the farm operations could be carried out more efficiently and economically than at present.

It is of interest that this season there has been a marked increase in the demand for the supply of superphosphate in bulk. Up to the beginning of June 1960, over 15,600 tons had been supplied from the several fertiliser works compared with 6,000 tons for the 1959 season. As farmers become more aware of its advantages, it is believed that the practice will become more popular.

PEDIGREE SEED SUPPLIES

The Minister for Agriculture (Mr. C. D. Nalder), has advised that supplies of pedigree seed of wheat, oats, barley and Wimmera ryegrass will be available for distribution from the forthcoming harvest at the Department’s Research Stations. Varieties available this season will be:

WHEAT
(Midseason) — Baroota Wonder (hay variety); Bencubbin; Eureka (rust-resistant); Kondut.
(Early)—Gabo; Wongoondy (rust-resistant); Insignia 49 (rust-resistant).
(Very Early)—Bungulla.

OATS
(Late)—Algerian.
(Midseason)—Avon; Dale.
(Early)—Ballidu; Kent.

BARLEY
Beecher; Prior.

Prices per bag of three bushels inclusive of rail freight to farmer's siding will be:
Wheat, 60s.; Oats, 40s.; Barley, 55s.; Barley (picked seed) 58s.

WIMMERA RYEGRASS
"Merredin" Early Strain.

Prompt attention to orders will be ensured if the following directions are observed by intending applicants:
(1) Make early application direct to the Department of Agriculture, St. George's Terrace, Perth.
(2) Give clearly full name, postal address, and siding to which the seed is to be railed.
(3) As soon as possible after receipt of account, remittance should be forwarded. Statements are sent out in order of receipt of the application. No definite reservations can be made until the seed is paid for.

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Arrangements have been made for the compilation of a comprehensive index to be incorporated in the December issue—a feature which will greatly enhance the value of the Journal as a work of reference.
Above illustrations have been reproduced from actual photographs of two sheets of mild steel, photographed after 50 hours in a high humidity cabinet. Before insertion in the cabinet, one was dipped in additive-treated Caltex Green Super Power Kerosine, the other into a non-additive type kerosine.

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