



Department of
Primary Industries and
Regional Development

Journal of the Department of Agriculture, Western Australia, Series 3

Volume 6
Number 4 *July-August, 1957*

Article 7

7-1957

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Recommended Citation

Rowbotham, J. C. (1957) "Bulk handling in the orchard," *Journal of the Department of Agriculture, Western Australia, Series 3*: Vol. 6: No. 4, Article 7.

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BULK HANDLING IN THE ORCHARD

By J. C. ROWBOTHAM, Horticultural Instructor

BY using specially-designed tractor-drawn trailers to transport apples in bulk from the trees to the grading and sizing machines, Mr. Ralph Grist, of Donnybrook, has effected considerable saving in labour on his 16½-acre orchard during the harvesting period.

Some rough calculations showed that in the average season, he and his employees lifted and put down bushels of apples about 30,000 times by the time the fruit reached the graders.

As the usual method of fruit harvesting involved a heavy expenditure on picking-boxes, or alternatively the soiling of a number of export cases by dust or mud, in addition to the strenuous physical labour, Mr. Grist decided to experiment with bulk-handling.

He constructed a trailer capable of carrying 60 to 70 bushels of fruit and

equipped to suit his particular conditions, and as this operated successfully he made two more.

Each trailer has an inside measurement of 10ft. 6in. long by 6ft. wide with sideboards 9in. high, and endboards 18in. high to enable the fruit to be stacked higher in the centre without rolling off when descending or ascending fairly steep slopes. The sideboards were kept low to obviate high lifting of filled picking bags. If a cranked or car-type axle is fitted, the top of the sideboards is only about 2ft. 9in. above ground level.

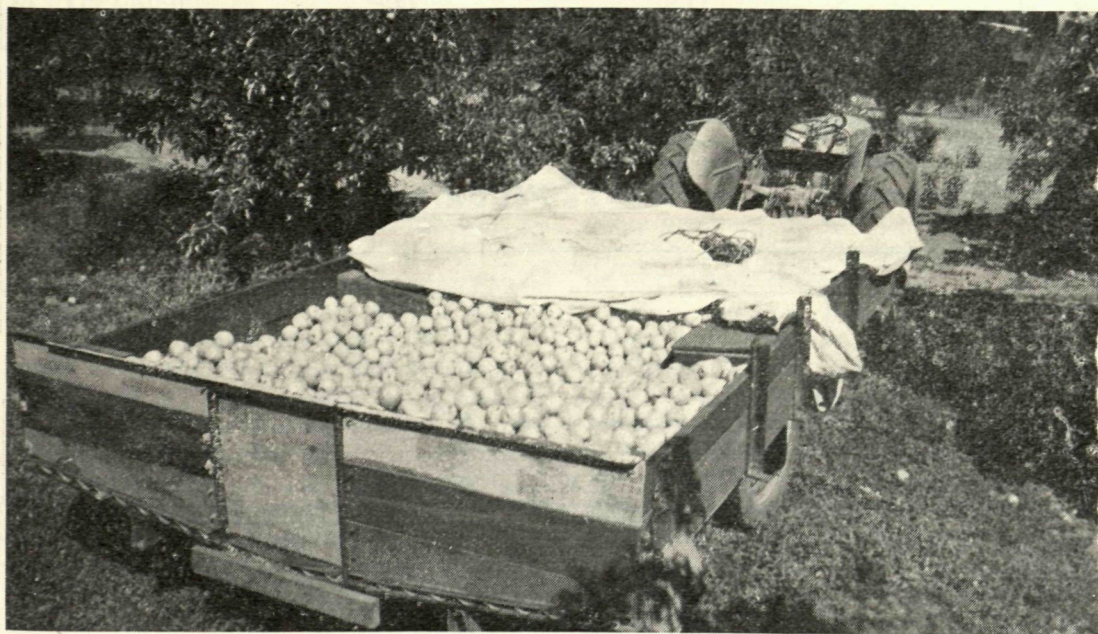


Fig. 1.—One of the bulk-handling trailers in the orchard. Note tent-fly used to protect the fruit from sun and dust

CONSTRUCTIONAL DETAILS

The floor of the trailer is made in the form of a broad V so that fruit rolls easily to the centre of the vehicle to facilitate emptying. The floor itself is made from 11ft. lengths of 6in. x 1in. dressed jarrah covered with linoleum. This material was found by experiment to give the best results as it enables the fruit to roll and slide freely, is easily swept free of twigs and dirt, and is weatherproof.

The two main 11ft. fore-and-aft bearers are of 5in. x 4in. jarrah. The four cross-bearers are 7ft. long and are made from 7in. x 3in. timber cut with a V that is $3\frac{1}{2}$ in. deep at the centre.

The centre pole or towing bar is an 11ft. length of 4in. x 4in. jarrah, projecting the required distance in front of the trailer and bolted to the cross-bearers.

A length of $1\frac{1}{4}$ in. piping with a plate welded on the bottom end serves as an adjustable prop or leg on the drawbar. The piping is inserted in a $1\frac{1}{2}$ in. socket which is drilled and tapped to take a cranked and threaded length of round iron which serves as a set-screw to hold the prop at the required length.

A pair of car or truck wheels, with tyres, tubes and a suitable axle are fitted, and the wheels are boxed in. If the wheels and

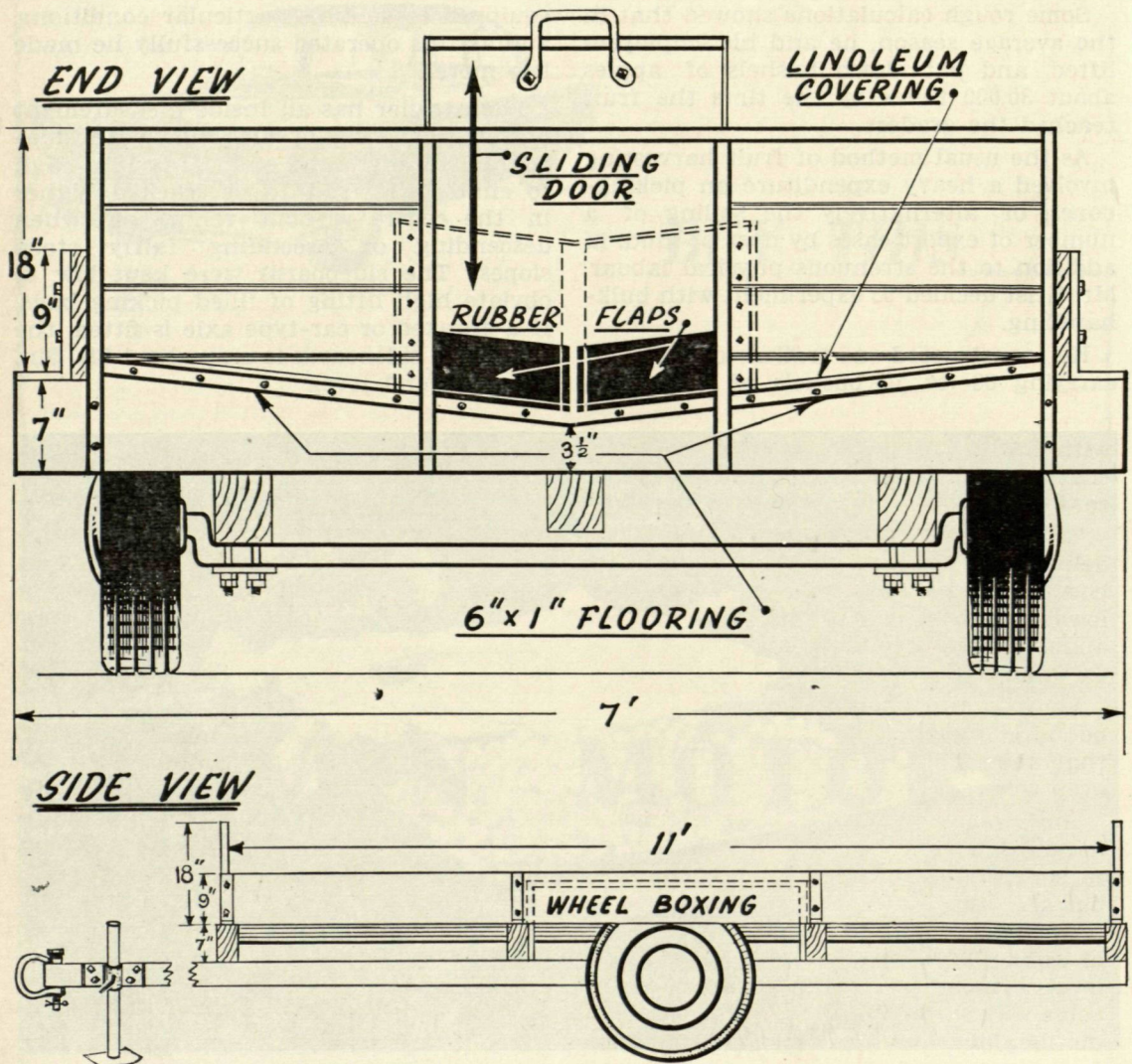


Fig. 2.—Diagrams showing the main constructional details

axles are made readily detachable, they could be used for other purposes if desired, and the trailer bodies could be stacked to take up less space during the winter months.

L-shaped stays of 2in. x $\frac{1}{2}$ in. iron are bolted on to the ends of the cross-bearers to support the sideboards.

The tailboard carries a sliding door of a suitable width to allow the apples to flow into the elevator. Two heavy rubber flaps are screwed inside the tailboard so that they meet across the inside face of the door when closed. When the door is raised the weight of the apples curves the flaps round the edges of the opening where they prevent the fruit from being bruised by contact with sharp corners.

The loaded trailer is backed up so that the sliding door is opposite the elevator. It is then tilted and held in position by the adjustable prop on the towing bar, and the door is raised to allow the apples to roll on to the elevator rollers.

The three trailers which Mr. Grist has constructed permit one to be emptying at the packing shed, with one filled in reserve under cover and a third being filled in the orchard. The average cost of each (less labour) was about £25.

Mr. Grist's shed is ideal for this type of bulk-handling as it is on sloping ground with the intake end at ground level and the output end at truck floor height for easy loading.

To adapt his fruit grader to the trailer delivery, he removed the hopper from the bottom of the elevator which was then lowered almost to floor level so that the apples moved through the sliding door on to the rollers when the trailer was tilted.

For ease of handling, the trailer should be fairly evenly balanced on the axle so that one man can lift and hold the pole even when the trailer is filled to capacity.

Any tractor driver with experience in handling trailers can manoeuvre the outfit squarely up to the end of the elevator, but a refinement which Mr. Grist intends to introduce before next season is a pair of concrete wheel channels above floor level. Apart from acting as wheel guides, these will enable him to increase the angle of tilt and so permit better movement of fruit towards the door.

NO SIGNIFICANT BRUISING

It may be thought that bulk-handling may lead to bruising of fruit but such is not the case, provided that care is taken in loading the first few bags of fruit. This merely involves careful placing of the lower end of the picking-bag near the centre-line of the trailer and easing the apples out.

If this is done, there is much less chance of bruising the apples than there is when pickers shoot them straight into a picking box or try to squeeze a bulging bag into the box to lessen the distance the fruit has to fall.

A tent fly is used to protect the fruit from sun or rain while in the trailer, and the trailer is parked in the shade of the trees whenever possible.

LABOUR SAVING

Using the trailers, Mr. Grist has been able to save one man's wages besides reducing his own working day. Formerly, he had to take out a load of boxes early in the morning and place them at suitable points in the orchard. The filled cases had to be carted into the shed at intervals during the day and when the pickers had finished he had to spend some time carting in the last filled cases and stacking them near the hopper of the sizing machine.

The trailers have abolished much of the lifting and carrying of fruit-filled cases and increased the speed of handling.

ADAPTATION

Obviously, not all fruitgrowers can use this method in its entirety. Many shed floors are built-up to truck level, but even here, the addition of sloping ramps might be worth considering.

Using smaller bulk containers with strong hooks or eyes at each corner, an overhead lifting gear and "traveller" could assist in taking the fruit to the elevator. Alternatively, the hydraulic gear fitted to many modern tractors could be used for lifting and carrying bulk containers. In the larger packing houses bulk containers could be handled by fork-lift trucks.

Bulk handling makes possible a reduction in handling costs which could bring great benefits to the industry.

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