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The preparation of fruit for marketing

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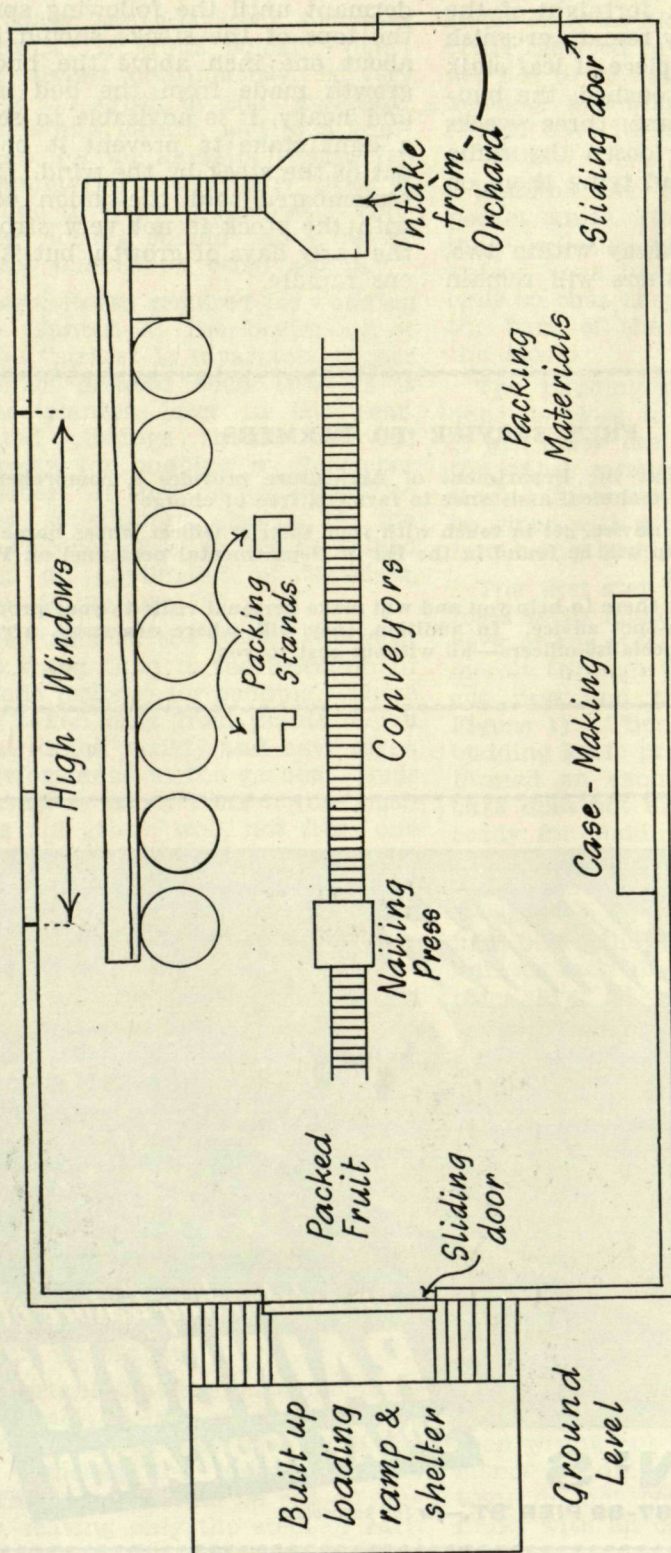
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General Packing Shed Lay-out



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Fig. 1

(Not to Scale)

THE PREPARATION OF FRUIT FOR MARKETING

Part 1—PACKING SHEDS, THEIR DESIGN AND EQUIPMENT

by

J. S. BLOOMFIELD,

Packing Instructor

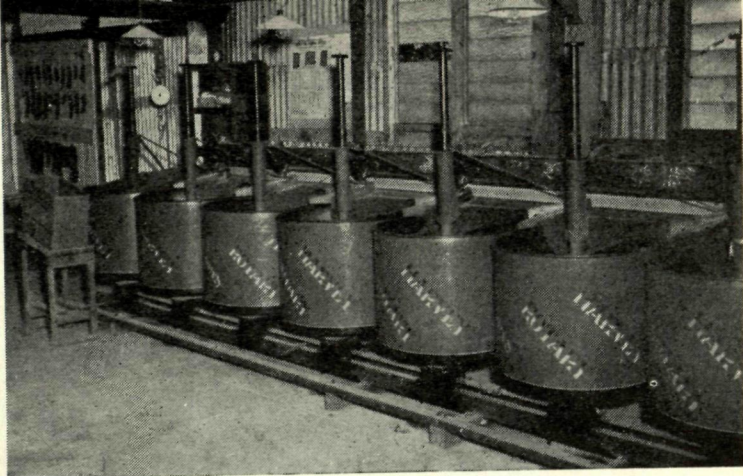


Fig. 2.—A seven rotary bin grader fitted against the wall is an ideal set up for the grower with 10,000 to 15,000 cases of fruit to handle

FRUIT production may be divided into three phases, namely, growing, presentation and marketing—each of which is an essential part of the final pattern. The efficiency within each section and the co-ordination between each phase of the industry will determine the ultimate return to the grower. In this regard presentation is a most important feature. For instance, high quality fruit delivered to a good market will lose in value should presentation be in any way unsatisfactory.

There are several factors which have influenced fruit-handling methods in Western Australia. Of these, the distribution of the fruit-growing areas in relation to local markets, and the dependence of the industry on the export trade are the most important. The shortage of adequate cool storage space in the fruit districts also has a bearing on handling methods.

FRUIT AREAS

In the Hills districts within 50 miles of Perth most varieties of fruit can be grown successfully in the limited areas of good soil situated in the valleys and along the watercourses crossing the coastal plain. These areas are ideally suited to the small mixed orchardist growing fruit mainly for local consumption, although in some instances growers are supplying considerable quantities of fruit for export. Citrus, grapes and stone fruits are the main crops, with apples and pears occurring only in the colder localities. In southern areas, however, the climate is better suited to the production of apples and pears and here the export of these fruits is the main consideration of growers. Around this pattern of fruit-growing, the method of handling the fruit—whether by the grower himself or by a centralised packing shed—has been developed.

EXPORT MARKETS

The production of fruit for export to overseas markets has played a large part in the development of fruit growing in this State and at the same time influenced handling methods. Approximately two-thirds of the apples produced are shipped overseas each year either to the United Kingdom, Europe or Singapore and in a favourable season, this export has amounted to more than a million bushels. The Singapore market, apart from receiving substantial shipments of apples, is also a useful outlet for limited supplies of grapes, citrus, pears and stone fruit by virtue of the short journey involved and the frequent shipping facilities available.

IMPORTANCE OF COOL STORAGE

The export of a perishable product such as fruit is closely associated with cool storage facilities. The European market for apples requires shipments to be completed early in June and, as these exports are handled either through the ports of Fremantle or Albany where cool storage facilities are available, there has been little incentive to build large cool stores in the main apple-growing areas. Orchardists nearer to Perth have, up to the present, relied on city cool stores for their needs. Un-



Fig. 3.—In large commercial packing sheds, a series of sizers usually run parallel to each other with gravity rollers taking fruit to the nailing down press from each machine

der these conditions the storage of unpacked fruit is impossible. This means that, with few exceptions, all fruit must be packed shortly after picking and this places an extra burden on packing sheds. With the increase of local population and improved electricity supplies, grower-owned cool stores which will allow fruit to be packed out of store after the conclusion of the picking season, as required for the local market, are likely to become more popular but the volume of fruit handled by this means is not likely to be very large.

SIZE OF PACKING SHED

The size of the packing shed the equipment to be used, and the layout will depend upon the quantity of fruit which has to be handled. Although adequate facilities are necessary for the easy and economical handling of fruit, care must be taken not to over-capitalise the pro-

perty by installing costly equipment which is far larger than is fully warranted. The apple industry is well served with large packing sheds run by the main exporting companies. These sheds accept fruit from growers at the shed door and prepare it for export. The largest of these concerns packs over 100,000 bushels during a season, with a daily average of 2,000 bushels for the main period and has reached a maximum output of 3,500 bushels in a day.

Two sheds of this size are situated at Bridgetown and one at Mt. Barker. At Donnybrook, Manjimup, Kendenup and Mt. Barker, sheds of 60,000 bushel capacity are operating, while sheds of approximately 20,000 bushels capacity serve Balingup, Mullalyup, Boyup Brook, Argyle, Capel and Albany. In addition, small grower community sheds are operating in the apple districts as well as private



Fig. 4.—Two single-sided machines fitted back to back may be operated as one unit with a common sorting table and a single drive

growers' sheds many of which are well equipped and can handle at least 10,000 bushels in a season.

The size of apple-packing sheds has been determined by the requirements of the industry which are rather different from those of other apple-growing States.

The major part of the apple production comes from six varieties, of which Granny Smith is by far the most important. Over the last ten years, considerable numbers of trees of the early mid-season varieties have either gone out of production or, where suitable, have been worked over to Granny Smiths, while this variety has been dominant in all new plantings. The Granny Smith owes its popularity to the fact that it is ideally suited to West Australian conditions. Not only does it commence to bear commercial crops at an early age but the quality of the fruit is

extremely good. The production of Granny Smiths is now approaching the total of all other varieties.

The necessity of handling the large quantity of Granny Smiths involved, in the limited period available places a severe strain on packing shed facilities. The fruit must not only be wrapped and packed ready for immediate export, but

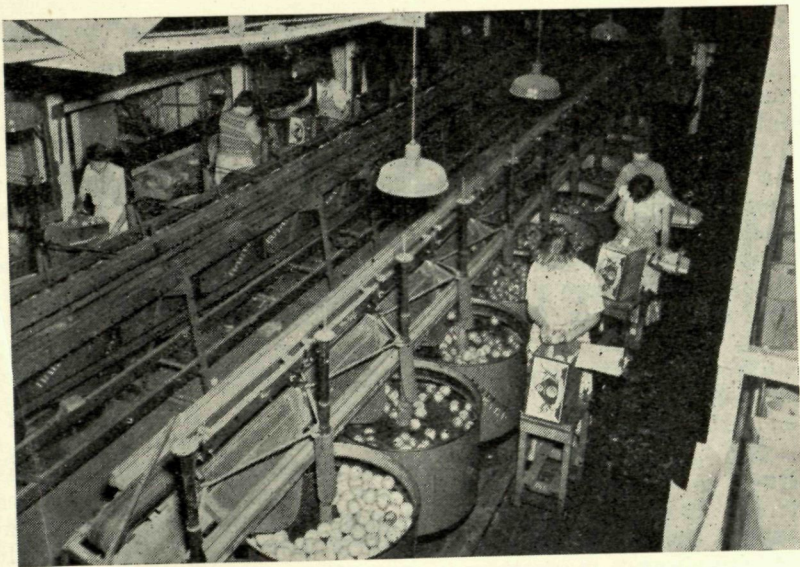


Fig. 5.—Single-sided machines placed back to back with individual sorting tables and drives are an advantage in that each machine operates independently

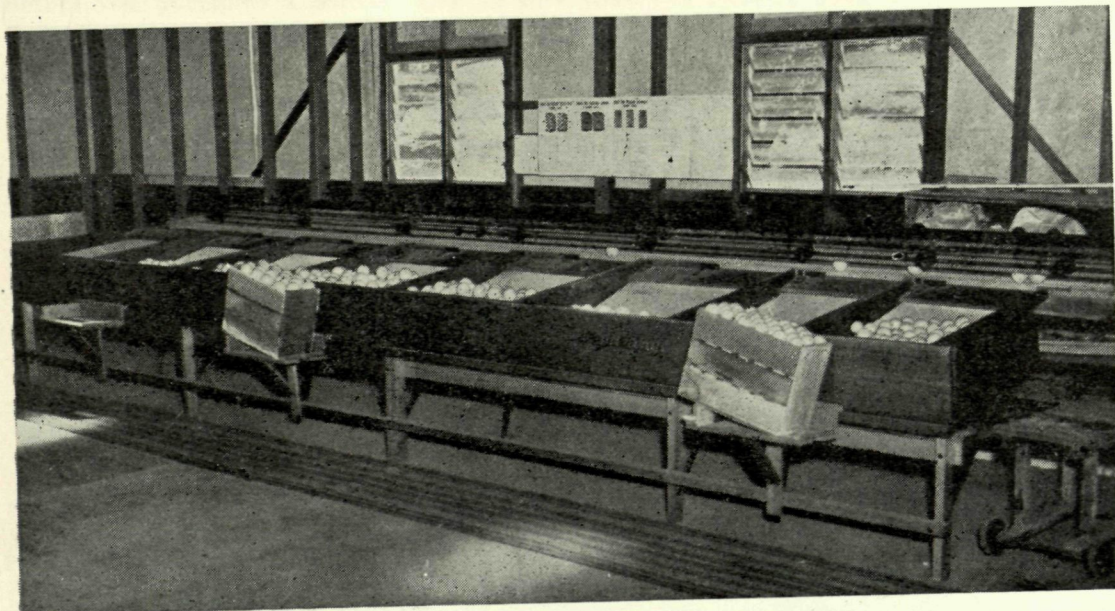


Fig. 6.—A nine-bin one-sided grader with canvas spring bins will be suitable for the grower packing up to 10,000 bushels

also for storage in anticipation of shipment at a later date. Granny Smiths supplied to the local market early in the season are usually unwrapped but fruit intended for late marketing is always wrapped and packed before cool storage. As a result the sheds must be large enough, and sufficiently well equipped, to handle the large volume of apples in a short period even though for the rest of the year they are not used. In addition the requirements for labour are essentially of a seasonal nature and the difficulty of obtaining skilled packers and shed hands further aggravates the seasonal rush.

The period of harvesting for citrus fruits is much longer than for other fruits. Both on the local market and for export the demand is restricted at any one time and marketing is spread over a large portion of the year. Consequently the citrus grower's requirements for labour are considerably less than for other fruits. He has been able to handle his own crop and central district packing sheds have not been developed.

Stone fruits are generally grown in mixed orchards and are handled by the individual grower with equipment used for other fruits.

PACKING SHED DESIGN

For efficient operation, a packing shed should be designed so that the fruit entering the receiving end will pass through the various stages of preparation with the minimum of handling and congestion, to be stacked at the dispatching point ready for loading. The ideal set-up is for the receiving and dispatching points to be located at opposite ends of the shed with the equipment so arranged that the fruit will pass unimpeded down the length of the building.

In the case of a grower's shed, some modification of this principle may be necessary to make use of an existing building. The design of the shed should be aimed at eliminating all unnecessary handling and reducing lifting to a minimum. Properly-constructed ramps at all loading points are very desirable from this point of view and in particular for the large packing shed where unloading and loading are practically continuous operations. From the truck the fruit should be delivered directly on to gravity rollers preferably extending on to the truck. Where the volume of fruit warrants, power-driven conveyor belts or rollers are worth considering.

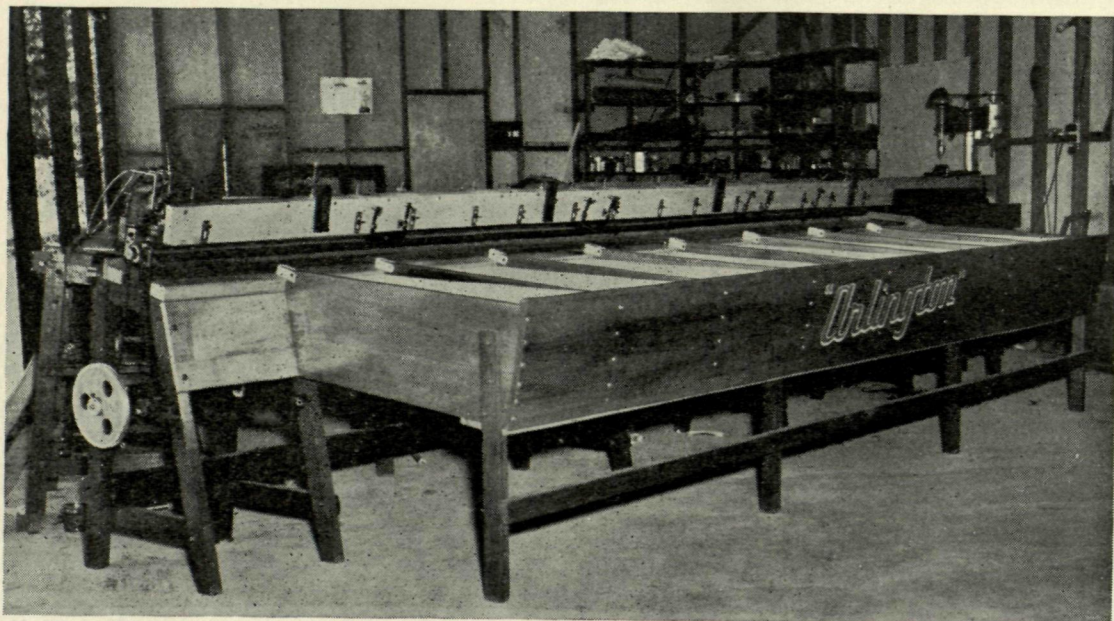


Fig. 7.—An alternative machine to that shown in Fig. 6, constructed in Western Australia

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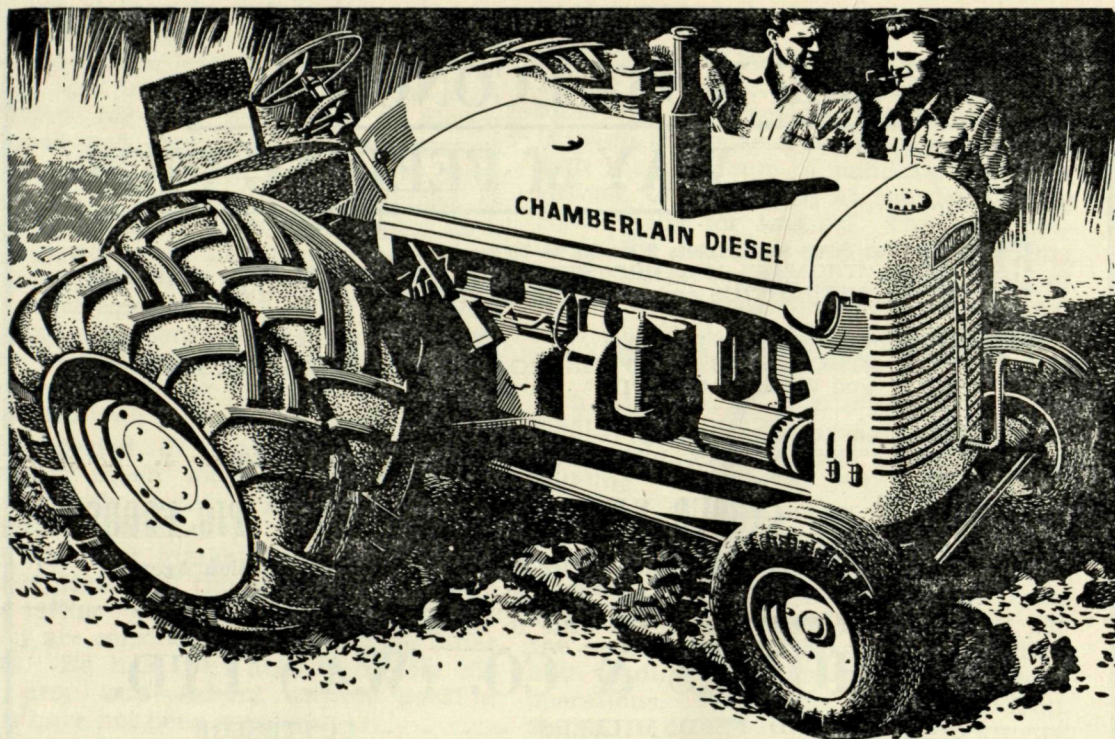
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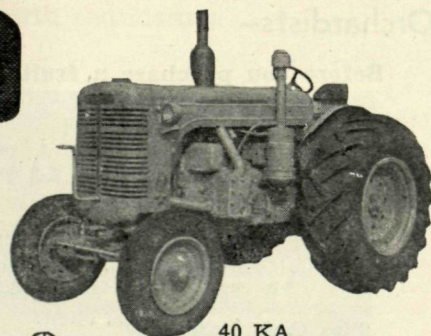
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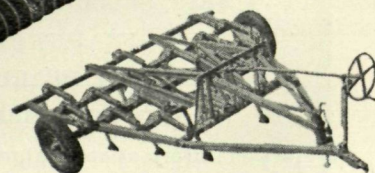
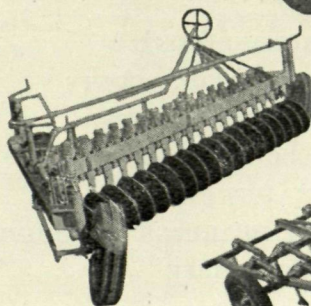
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In a grower's shed it is usually an advantage to unload at ground level. The fruit comes into the shed from the orchard on a table top lorry, the boxes stacked one or two high. It is then possible for the person unloading to take them directly from the vehicle and stack them in a convenient position on the shed floor. An important consideration regarding this type of construction is that trucks can back into the shelter of the shed during unloading in wet weather and also it allows the shed to be used as a vehicle shelter during the off season. The loading-out ramp nevertheless should be at truck-top level to avoid unnecessary lifting. This type of shed readily lends itself to construction on a slope.

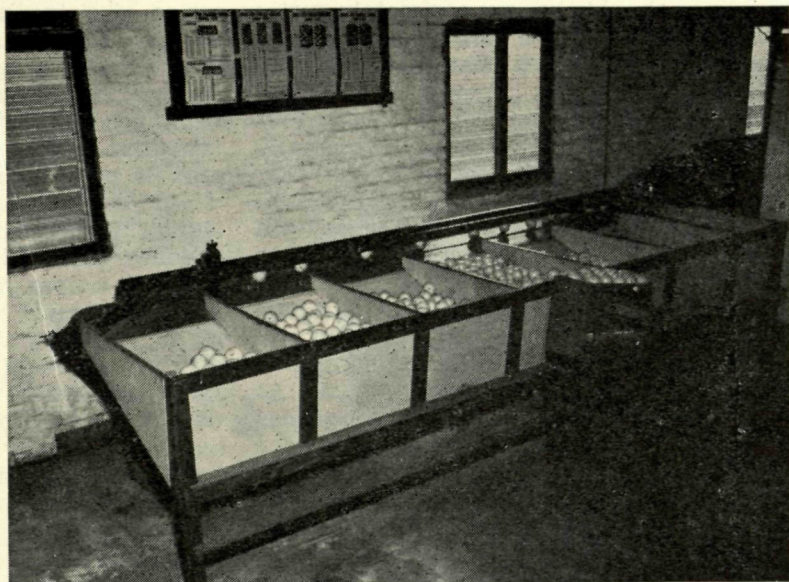


Fig. 8.—The small mixed orchardist can successfully construct this simple machine with a single sizing roller

Although a wooden floor is easier to work on, from a constructional point of view the small grower would probably find concrete more satisfactory. The cleaning of a concrete floor is also a simpler operation. Consideration should also be given to the weight which the floor will be required to carry. For instance the weight of cases of apples stacked ten high is equivalent to 280 lb. per square foot, or 500 cases would weight approximately 12½ tons.

Adequate lighting and ventilation are most essential requirements. The saw-tooth roof which is accepted as the most satisfactory for modern building construction gives a very good uniform lighting throughout the building and should be used wherever possible. Skylights seldom give satisfactory lighting in a large building. The aim should be to have maximum light on the sorting tables and packing bins without direct sunlight or glare.

This may be accomplished by fitting the windows above the packing bench high up in the wall so that the light is above the

packer and not reflecting directly into the eyes as would occur if the windows were at eye-level. Where possible, light for the sorting and packing bench should originate in a southerly direction as it is found that this light is softer and gives more even lighting.

Artificial lighting is usually required at some time in all packing sheds and provision should be made preferably for fluorescent tubes when suitable electric current is available.

Ample ventilation should be provided and this may be arranged by the installation of conveniently-placed sliding doors, which, while enabling a through passage of air during the summer, can also be used to prevent draughts in the colder months.

Cool storage is being used to an ever-increasing extent for the handling of fruit before and after packing and where the installation of a cool store is contemplated it is essential that the packing shed and cool store be built as a unit. That is the cool store chambers should open directly into the packing shed.

INTERIOR LAYOUT

The accompanying diagram (Fig. 1) is suggested as a practical layout for a grower's packing shed. The length of the

building should be approximately twice the width, e.g., 60ft. x 30ft. is an ideal size. It will be noted that the fruit from the orchard enters at one end of the building and passes through the various stages of preparation until it is finally stacked ready for loading at the other end. This continuous flow is an important feature in the design. A seven rotary-bin grader complete with hopper and elevator is shown fitted close to the south wall with sufficient room to make adjustments behind the machine and carry out all maintenance work. An illustration of this type of machine is shown in Fig. 2. At a convenient distance from the grader and parallel with it, a gravity conveyor takes the fruit from the packer to the nailing-down press. A short section of conveyor after the nailing press is most helpful for stencilling, wiring, etc., before finally stacking the cases ready for loading out. On the north wall is ample room for packing materials which are centred about the case-making bench conveniently placed so that made-up cases can be stacked in easy reach of packers.

This set-up, with three experienced packers, could handle up to 350 cases per day. Where slightly larger quantities of fruit have to be packed the addition of two more bins would provide work for another packer. The maximum output of a single-sided machine would be approximately 500 cases per normal day. Where the quantity to be handled is in excess of this, then it would be necessary to install further machines. In the larger commercial sheds it is usual for a

series of sizing machines to run parallel to each other (as shown in Fig. 3) with the necessary gravity rollers between, feeding the several nailing presses. Single machines are satisfactory for wall positions but in central positions it is preferable to place sizers back to back. These double machines may be run either as a single unit (as in Fig. 4), that is with a common sorting table and single drive, or the two halves may operate as separate units (as in Fig. 5). The latter arrangement is preferable as it enables two different lines of fruit to be run at the same time. Due to the number of cases needed in a large shed the case-making section is usually located off the packing floor in an elevated position so that the cases can be fed direct to the packers by chutes.

Growers with small mixed orchards may find that imported graders are too large and expensive for their needs. To meet the need of the small orchardist some locally made graders, as shown in Fig. 7, are available. Several very creditable machines have been built by growers themselves. One of these is shown in Fig. 8.

Regardless of the size of the packing shed, the economical handling of fruit will depend upon the equipment available, its arrangement to enable operators to make full use of modern machines, and the ability of the management to set up and maintain them in efficient working condition.

(To be continued.)

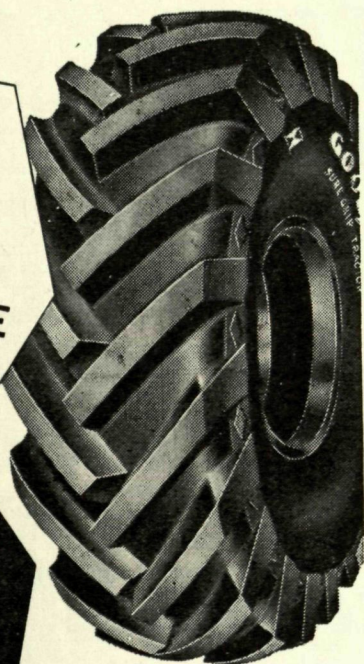


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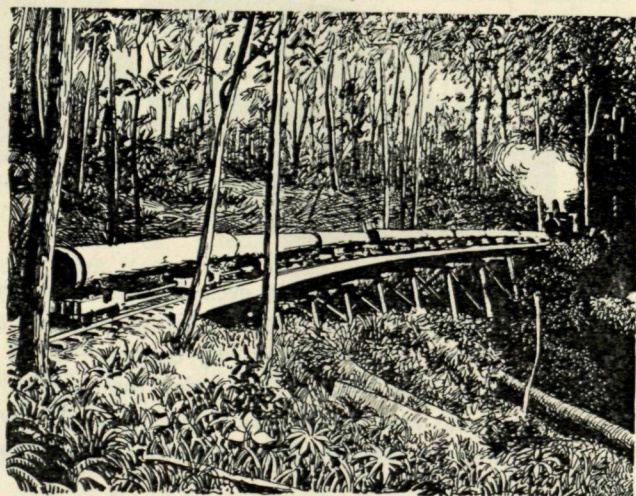
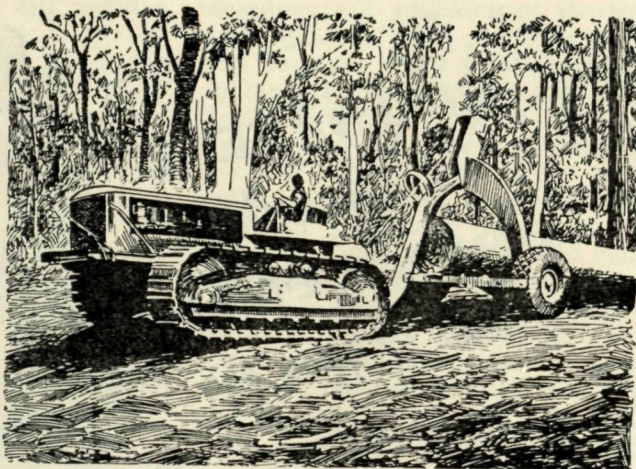
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