



WOOL
HARVESTING
NOTE

No: 1.12
DECEMBER 1981

FENCES FOR YARDS

INTRODUCTION

The purpose of sheep yards is to confine sheep and control their movement. This can only be realized if fences have adequate height and strength. In addition to these basic requirements, the fences must be made from durable materials needing minimum maintenance.

For details of gates and their connections to fences refer to Wool Harvesting Notes Nos: 1.10 and 1.101.

HEIGHT

The height of fences should be such that sheep are disinclined to try and leap over. This is partly dependent on breed characteristics such as animal size, temperament and sex, and partly on operator attitudes and practices. On the other hand, fences should be low enough to allow operators to step over them in order to move quickly from pen to pen. To be able to do this saves the time of opening and closing gates.

Thus, fence height is a compromise between confining the sheep and providing convenient access for operators and their dogs. Experience has shown that a height of about 850 to 900 mm is satisfactory, with the enclosing fence around the perimeter of the yards sometimes being higher at, say, 1000 mm.

STRENGTH

The ability of the fence to withstand the side forces applied by sheep in the yards (and occasionally by charging animals) depends mainly on the materials used and how they are assembled. However, strength is also related to the soil characteristics at the site. Hard soils such as gravel and hard clay withstand forces much better than soft soils such as sand, silt and soft clay. Thus the stability of the fence posts depends on the ability of the soil to withstand the forces applied to it, and setting posts in concrete is one way of increasing the area which bears against the soil making it harder to push posts out of position. Because of the wide variety of soil types, it is not possible to lay down specific details of post spacing or depth in the ground to cover all cases. Local practice should be followed.

As a general guide however, post spacing is usually in the range 1800 to 3000 mm for straight fences. In sections of yards where there is a high sheep density and hence greater forces (such as forcing pens) the spacing between posts may need to be reduced. It may also be necessary to put posts closer together for some curved fences in order to obtain the correct curvature.

General fence posts are usually set into the ground a distance of 500 to 600 mm, although this may be increased to 900 mm for the main gate posts.

The method by which rails are joined end to end, the connection of rails to posts, and the side of the posts on which the rails are attached all influence final strength of the fence. As a general principle, the rails (or other infill material) should be placed on the side where greatest sheep density is expected. This means that the largest forces expected to be carried by the fence will tend to push the rails against the posts rather than away from them.

MATERIALS

The commonest materials are timber and steel. Fences may be made entirely of timber, especially if durable species are available on the property. Alternatively, they may be made entirely of steel products, or combinations of timber and steel.

Final choice usually depends on one or more of the following factors:

- material cost and availability — which materials are most readily obtainable, either on the property or in the district, new or second-hand;
- construction methods — a personal preference for working with steel or with timber, and the resources available both in the farm workshop and on the site;
- availability of time — whether the property owner is able to contribute all or most of the labour, or whether time is strictly limited in which case prefabricated steel components may be considered, or a contractor engaged;
- sheep behaviour — the greater visual barrier produced by the fences with timber rails may assist in controlling sheep and moving them in required directions.

EXAMPLES

A. Timber Posts and Rails

Examples of this type of construction are shown in Photos 1 to 3. Usually four rails are used, typical material being 150 mm × 25 mm or 100 mm × 38 mm hardwood. Spacing of these rails is given in Diagram 1.

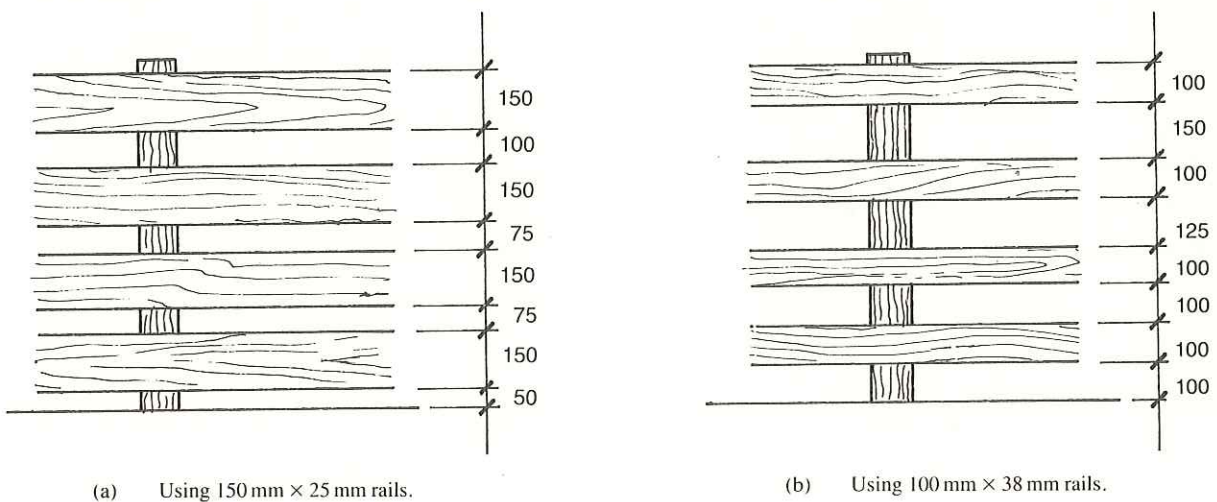


Diagram 1. Spacing of timber rails. Dimensions are in millimetres.

Posts may be either sawn or round hardwood suitable for in-ground use, or round poles pressure treated with preservative. Typical sizes are 125 mm × 100 mm for sawn hardwood, and 100 to 125 mm diameter for round posts.

Rails are usually bolted to the posts using, say, 10 mm diameter bolts. Alternatively, a wire twitch can be used as shown in Photo 4.



Photo 1. Sheep yards with timber fences and gates.



Photo 2. Yards with timber fences. Notice the use of large steel washers on the bolts securing rails to posts.

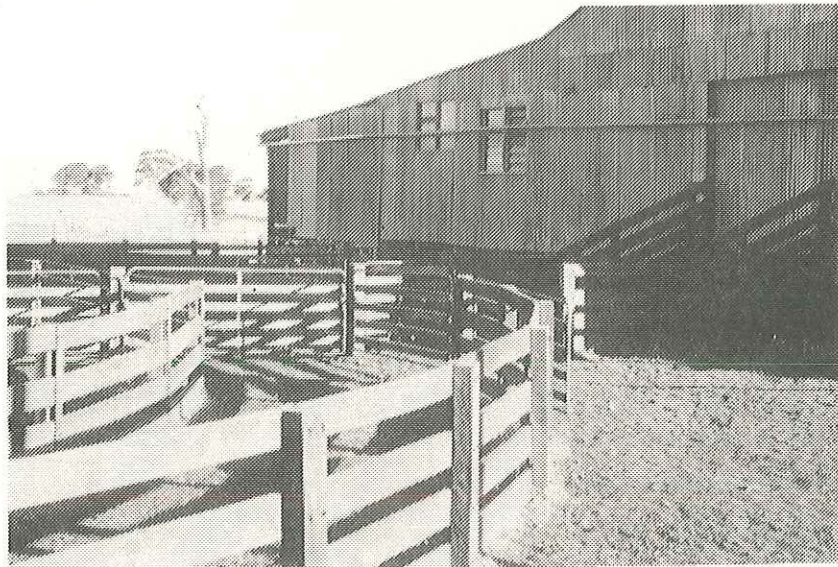


Photo 3. Timber posts and rails used for curved fences.

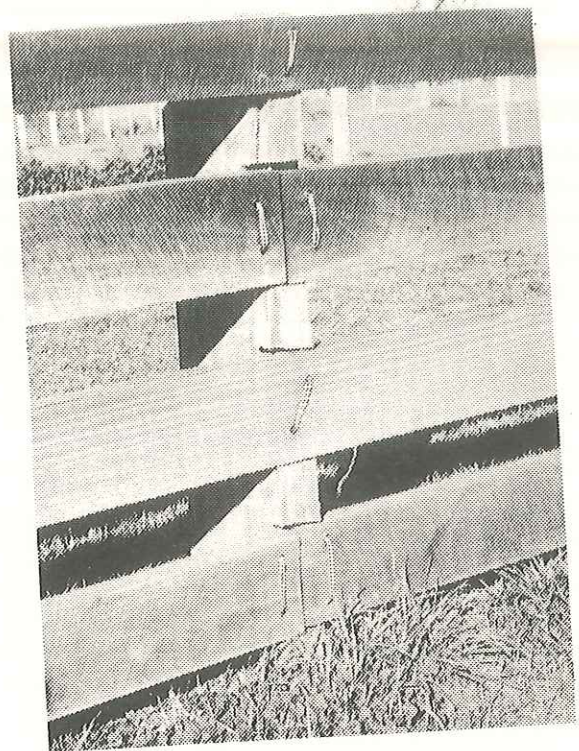


Photo 4. Rails secured by wire twitches.

The rails should be attached on the side of the fence where greatest sheep density is expected. This gives improved strength as outlined earlier, and also gives a surface free of projections (such as the posts) which hinder sheep movement. For internal fences where forces on both sides may be large, the rail-to-post connection can be improved by using large rectangular washers under the bolt heads against the rails as can be seen in Photo 2.

It is important that projecting bolt ends, or the ends of wire twitches, are cut off to give a neat finish in order to avoid injury or damage.

Photo 5 illustrates some fences for yards built from local durable timber used in its natural state. These fences have remained in serviceable condition for very many years.



Photo 5. Yard fences made from natural durable timber.

B. Steel Posts and Rails

Photos 6 to 8 show fences of this type. Five or six rails can be used, and generally these are black or galvanised pipe. However other tubes can be used, and details of common types are given in Wool Harvesting Note No: 1.092.

The top rail is usually 25 to 32 NB medium grade pipe, while the other rails are 20 NB medium pipe. The top rail can be welded to the tops of the posts after their ends have been partly flattened or closed to make a neater weld. Alternatively, all the rails can be welded to the sides of the posts, and caps used to cover the post ends. Spacing of rails is indicated in Diagram 2.

Posts can be 40 NB pipe with 50 NB pipe used for main gate posts. They should be set in concrete for greater stability. The length of posts is influenced by the fact that the standard length for pipe is 6.5 metres, and this allows four posts each 1625 mm to be made without waste of material. Other products such as second-hand railway line can be used for posts, and imperfect or second grade tube (often obtainable at a cheaper rate) is suitable for yard fences.

To give greater vertical support between posts, one or two droppers made from steel flat, say 40 mm × 5 mm, can be used to support the rails as shown in Photo 6.

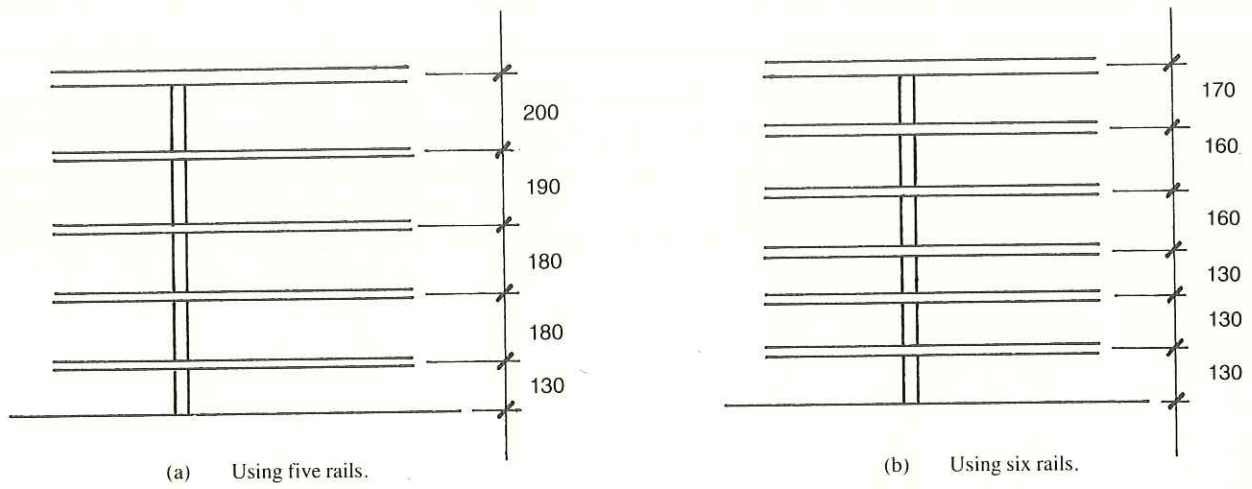


Diagram 2. Spacing of steel pipe rails. Dimensions are in millimetres.

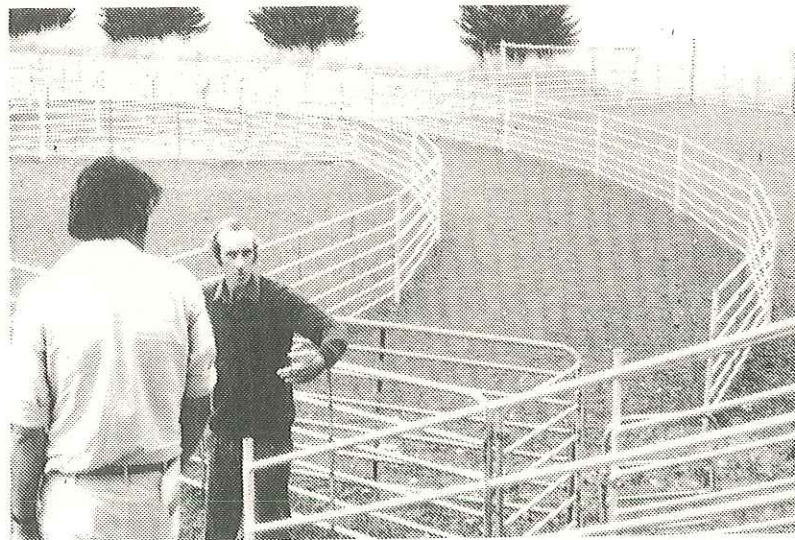


Photo 6. Sheep yards using steel pipe posts and rails with vertical droppers between posts.

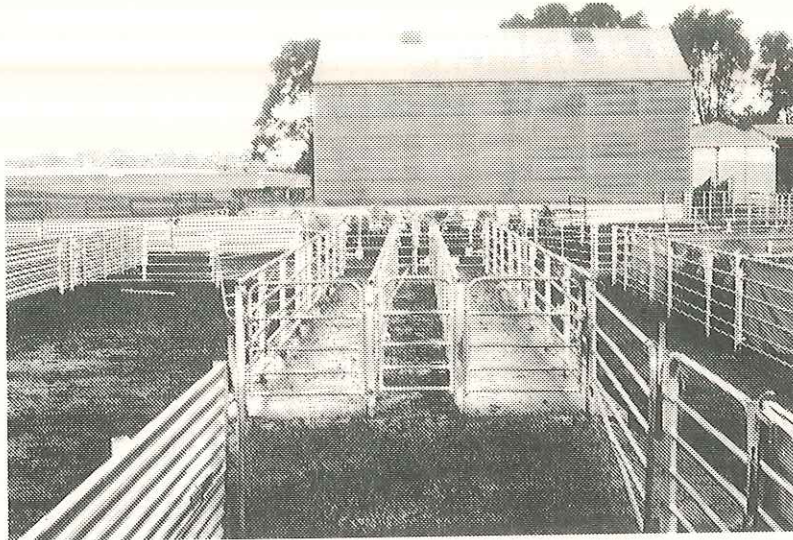


Photo 7. Yards using steel pipe together with galvanised corrugated iron.

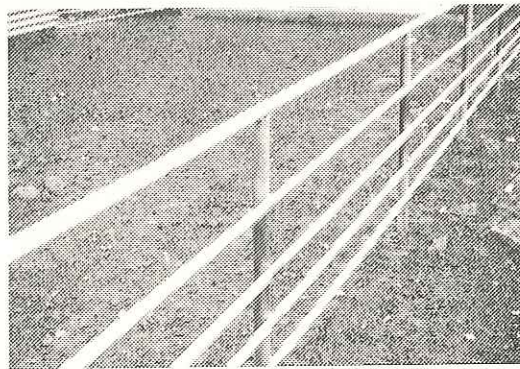


Photo 8. Yard fence using five steel pipe rails.

C. Prefabricated Panels

Where a property owner is unable to spend time making components for a set of yards, or hasn't the equipment to do so, prefabricated panels may be a suitable alternative.

Manufacturers specializing in animal handling equipment produce a variety of components from which yards of various types and capacities can be made. Standardized sheep panels produced using processes or equipment outside the scope of a farm workshop give the potential for high quality and speedy erection. Since the panels are rectangular, they may need to be stepped when assembled on sloping ground.

Photo 9 shows galvanised mesh panels bolted to steel posts, the form of the panels being such that horizontal rails are not necessary. The panels are 3000 mm long and 900 mm high, and the metal strip along the top makes it safer for dogs working in the yards. Panels can be supplied in ungalvanised condition if required.

Another type of panel is shown in Photo 10. No additional posts are required when erecting fences using these units. Panels are usually 2400 mm long and about 900 mm high.

Photo 11 shows a complete set of yards made from prefabricated components.

Photo 9. Prefabricated steel mesh panel folded top and bottom to give lateral strength and stability.

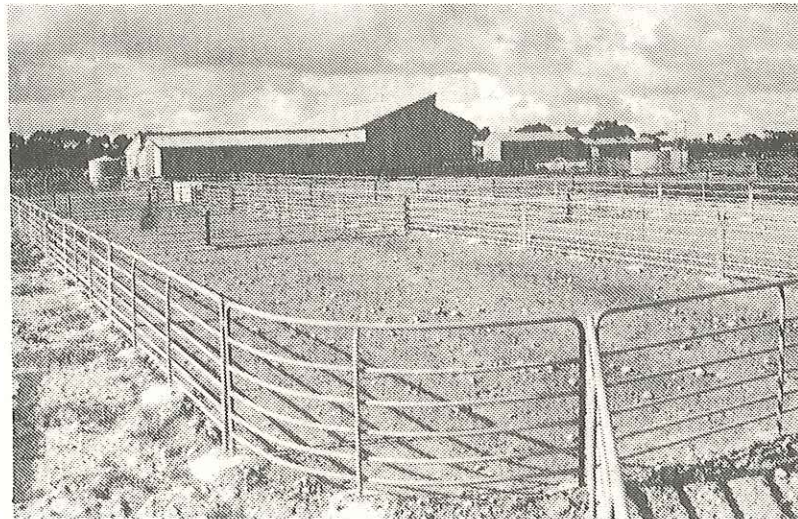
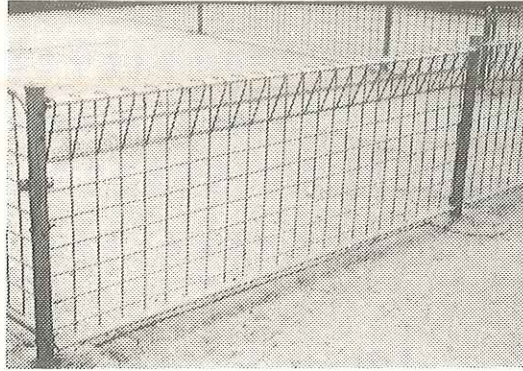


Photo 10. Prefabricated steel pipe panels incorporating posts.

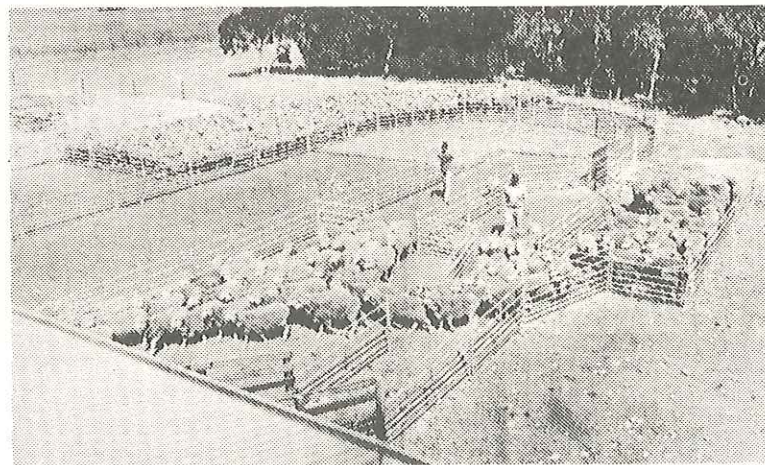


Photo 11. Sheep yards assembled from prefabricated steel components.

D. Combinations of Steel and Timber

Examples of fences using both steel and timber are shown in Photos 12 to 15.

Photo 12 shows fences with round hardwood posts and a single timber rail, the infill being general purpose steel mesh. Mesh can be supplied in flat sheets 6 metres long or in rolls 30 metres long. The mesh can be attached to timber posts in a number of ways:

- by staples where the nail holding ability of the timber is good;
- by timber or steel battens bolted to the post so that the mesh is firmly clamped between post and batten;
- by U-clips and bolts where the clip passes around the appropriate wire of the mesh, the bolt passing through holes in the ends of the clip and then through the post;
- by using J-bolts where the hook of the bolt secures the appropriate wire of the mesh to the post.

Photo 13 shows fences using treated radiata pine posts and rails with the mesh stapled on the side where the sheep density is greatest.

When using steel mesh, a neater and more satisfactory job results if the mesh is first tensioned. This can be done by fixing one end of the length of mesh, and then using G-clamps or similar tools to pull the other end lengthwise towards another post. Fixing can then proceed and the clamps finally removed.



Photo 12. Yard fences using timber and steel components.



Photo 13. Steel mesh used in conjunction with treated timber posts and rails.

The steel mesh is a versatile material, but it is not recommended for use on fences in areas where there is likely to be a high sheep density, such as in forcing pens. The main reasons are:

- horns may become entangled;
- sheep pushed against the mesh find it hard to move forward, and this slows general sheep movement;
- in common with pipe rails, the mesh provides a limited visual barrier which may encourage some sheep to charge at it in the hope of breaking out.

In Photo 14, galvanised corrugated iron is used on timber posts to provide a fence which restricts the sideways vision of sheep so that they move better in the required direction. The corrugated iron is just clear of the ground surface to minimise corrosion problems, and a 25 NB pipe is used along the top to prevent injury or damage from the sharp edge of the iron.

A similar combination is shown in Photo 15 except that a timber capping rail is used.

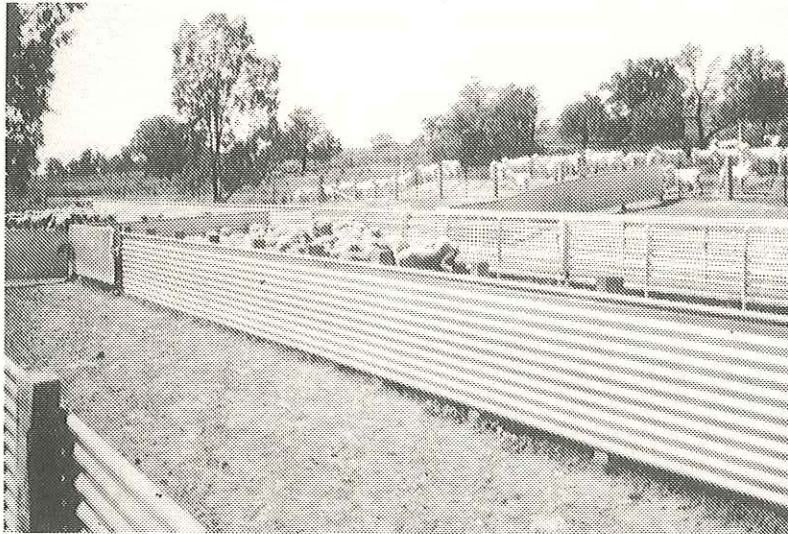


Photo 14. Corrugated iron used with timber posts to provide a fence which limits the sideways vision of sheep in the yards.

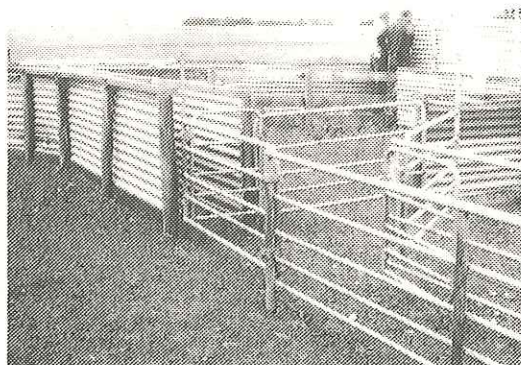


Photo 15. Steel and timber components used in sheep yards.