

CHAPTER 2. HARNESSING AND TRAINING

2.1 HARNESSING OF DRAUGHT CATTLE

2.1.2 MAKING THE WOODEN SHOULDER YOKE (DETAILS)

(Source: S.P. Ejoku, Soroti, Uganda)

INTRODUCTION

The general features of shoulder yokes are described separately in the **Module 2.1.1**. This Module describes in detail, how wooden shoulder yokes are recommended to be made from locally available materials in Uganda. Such an exercise is highly recommended to be undertaken during a training course and could well be applicable in other countries using this type of yoke.

SELECTION OF THE YOKE POLES

The poles chosen for making the yoke should be strong, straight and free from too many knots. They should be 8 to 10 cm in diameter. Eucalyptus or poles cut from other local trees are often found suitable. The pole length required is approximately 60 cm longer than the nominal yoke length to be made (eg. a plough yoke of 90 cm will require a pole of about 150 cm). Four additional lengths of 45 cm will also be needed for the pegs or skeis.

Poles should normally be dried before making the yoke. However, if time is short, remove the bark, trim the pole and apply oil to prevent splitting along the grain. Alternatively, place the wet wood over a fire to lightly burn it (and hence dry it); remove the bark after the burning process.

CUTTING THE POLE TO THE CORRECT LENGTHS

Once the pole has been selected, it should be cut down and trimmed as follows:

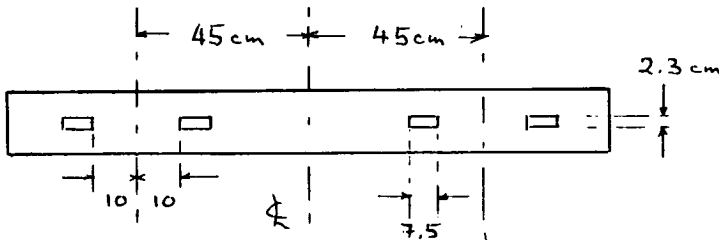
- Cut it to a length 60 cm longer than the yoke required. In this Module, the making of a ploughing yoke of 90 cm is to be described, requiring a total pole length of 150 cm;
- Cut four additional lengths of 45 cm for making the pegs (or skeis);
- Remove the bark by hammering along the length of the pole, to separate the bark from the wood. Peel off the bark;
- Trim the pole with an axe, removing any knots and reducing the diameter so that it is between 7.5 cm and 8 cm.

MAKING THE HOLES FOR THE PEGS (SKEIS)

- Draw a centre line along the length of the shaft and mark the middle point;
- From the centre mark, measure 45 cm to either side. These two marks will be exactly over the animals' shoulders and the distance between them is known as the "yoke length"

(It follows that): for a longer yoke of 135 cm, a pole of 195 cm is needed, and that these same marks should be made at 67.5 cm on either side of the center mark).

- Depending on the thickness of the draught animals' necks, measure and mark a length of between 10 and 11.5 cm on either side of each peg centre mark. These marks must be on the centre line of the shaft and parallel to the length of the shaft;
- Now draw the holes for the four pegs so as to measure 2.3 cm wide by 7.5 cm long. These are drawn towards the outside of the yoke from the two outer marks just made, and towards the centre for the two inside marks just placed (see Diagram)



- Use an auger with a diameter of 2 cm or less and drill one hole through one of the marked peg slots. Secure the position of the yoke by placing a metal rod through the hole and hammering it into the ground so that the pole cannot rotate;
- Drill three holes per slot, all carefully made to be parallel to the first hole. Then use a mallet and chisel to remove the remaining wood (care is needed to make a good yoke);
- Smooth off the edges of the peg holes with a file and sand paper.

MARKING AND DRILLING THE CLAMP HOLES

- Measure a distance of 5 cm to either side of the centre mark of the pole. Draw a line around the yoke shaft at these two positions;
- Measure a further 10 cm from these two marks, towards the pole ends. Draw lines around the pole shaft at these two positions also;
- Measure the yoke diameter with a piece of string (it should be about 8 cm). Now place one end of the string on the centre line along the shaft, near to a peg slot. Wrap the string around the shaft and mark the spot reached by the other end (in other words, measure an arc length round the shaft equal to the shaft diameter). Repeat this measurement near the other peg slot, mark the spot and draw a line between the two marks just made. Where this line intersects the lines at 5 cm and 10 cm around the shaft is the entry point for drilling the clamp holes. It is at 35 degrees to the horizontal;

NOTE: This is the position of the holes for a normal yoke clamp. If two pairs of oxen are to be used, the clamp holes for the front yoke must be made at 90 degrees to the holes for the pegs. These can be measured easily with a carpenter's square.

- Now that the drilling entry points are marked, clamp the shaft so that it cannot rotate and carefully drill the four holes for the clamp (use a 13 mm or 14 mm auger). Make sure the holes pass through the heart (centre) of the shaft and emerge exactly opposite.

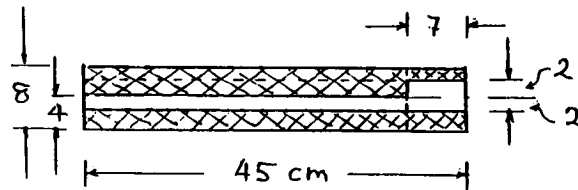
MAKING THE CLAMPS AND CLAMP PLATES

- Cut two lengths of 30 cm from a round mild steel of 12.5 mm diameter. Bend them around a pole of between 8 to 10 cm diameter to form a smooth "U" shape;
- Make the clamp plates by cutting two lengths of 12.5 cm from a piece of flat strip 25 mm wide and about 3 or 4 mm thick. Drill two holes in the plate along the centre line and 10 cm apart to coincide with the clamp holes on the yoke;
- Place the "U" shaped clamps through the holes in the yoke and fit the cover plates over the protruding ends;
- Hammer the ends over along the shaft length to secure them in position.

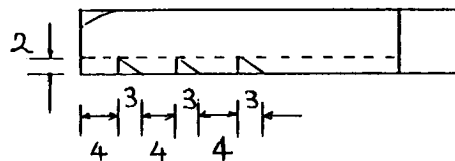
MAKING THE PEGS

Take each of the four 45 cm lengths of the pole cut previously to make the pegs and shape them as follows:

- Draw a centre line along the length of the peg (skei) shaft;
- Draw two lines 2 cm to either side, parallel to this centre line;
- Select the better



FINISHED PEG



NOTCHES

- end for the head of the peg and measure 7 cm from that end. Draw a line around the shaft at this position;
- Use a saw and a chisel to cut off the unwanted parts (see diagram above).

- Mark three notches along one edge of each peg; cut these notches;
- Remove all rough edges from the peg with a file and sand paper and make sure that it fits into any one of the peg holes on the yoke.

MAKING THE EYES FOR THE STEERING REINS

Eyes are attached to the end of the yoke shaft and help to keep the steering reins out of the animals feet, guiding them along their sides. Different types of eyes can be made either from thick wire or from lengths of round bar having a diameter of between 4 and 6 mm.

1ST TYPE OF EYE: Use pieces of round bar of between 4 and 6 mm diameter. Drill a hole slightly wider than the bar diameter, through the yoke shaft at 5 cm from each end and parallel to the peg holes. Hammer one end of the bar to form a secure, round eye on one end of the bar and push the straight part through the hole. Decide whether to bend the other end over or to form a rivet and mark the correct length to which it should be cut. Cut off the excess and secure it in place by either hammering it over or forming a rivet.

2ND TYPE OF EYE: This type is similar to the above, except that the straight end will be threaded so that it can be fixed in place with a nut and washer. A thread cutting die will obviously be needed, appropriate for the size of bar used.

3RD TYPE OF EYE: Instead of drilling a hole through the yoke shaft, grooves or necks can be cut around it, again at about 5 cm from each end. These are to locate the eyes in place and so should be of a width chosen according to the material used (thick wire or thin round bar).

- Make the eyes from either the round bar or the thick wire. Be careful that the steering reins are going to be correctly located and cannot slip out of the eye.
- Now shape the other ends to wrap around the yoke shaft, fitting snugly into the grooves and cut to a length so that they can be twisted securely into place.

SEASONING THE YOKE

Now that the yoke has been completed, it should be seasoned to lengthen its life:

- Place the yoke into a bath of water and leave it for at least a week
- Alternatively, cover it with manure taken from the animal shed for at least two weeks
- After the yoke has been treated by one of the above methods, allow it to dry slowly in the shade.