

CHAPTER 3. SEEDBED PREPARATION

3.5 TECHNIQUES OF HARROWING

3.5.1. THE CHOICE AND USE OF THE HARROW

INTRODUCTION

The harrow is used to break down the clod size and to assist with field levelling after ploughing. It also lightly compacts the surface soil so as to provide good contact with the seed once sown. Harrowing is an operation frequently neglected by farmers using animal traction equipment but can greatly improve the quality of seed germination, particularly in those areas subject to moderate or higher rainfall and for cereal crops such as wheat, barley, etc.

Harrowing is particularly important for crops to be sown with a seeder or a row planter. It may also be used to incorporate seed which has been broadcast, although this seeding technique is far inferior to the use of a seed drill due to the uneven depth of sowing.

Harrowing will not normally be necessary after preparing the field with a scarifier, provided that two crosses have been made. Under these conditions of lower rainfall, timely sowing after the second or third rains is of predominant importance.

Harrowing would not normally be practised if the rows are to be ridged before planting. However in this case, ridging without prior harrowing will only be successful if the plough has prepared a relatively clod free and even surface.

HARROWING IN ITS SIMPLEST FORM

Tree branches can constitute a cost-free but only marginally effective way of harrowing the field (Fig. 1). They can be weighted down with rocks but will do little more than break surface clods.

The method is not to be recommended except in exceptional circumstances where no custom made harrow is available. Even then it should only serve as a temporary solution.



Fig. 1 Branches used for harrowing to break surface clods. This is a cheap possibility but the method does not work the seedbed down to the desired depth.

Photo: J.E. Ashburner

CHOICE OF SPIKE TOOTH HARROWS

A spike tooth harrow should be able to penetrate down to a depth of between 5 and 8 cm. It will break surface clods, mix the soil and provide a degree of levelling to the soil surface. Excessive surface vegetation will block the tines and greatly reduce penetration. It is therefore important to correctly plough the field and to invert the soil properly beforehand.

Wooden harrows may be made by local artisans and fitted with metal spikes forged by the blacksmith. A hard wood should be chosen as being more resistant to insect attack (Fig.2). Between 15 and 20 spikes will normally be appropriate for pulling behind a pair of animals.



Fig. 2 A wooden harrow with metal spikes which can be forged by the local blacksmith.

Photo: J.E. Ashburner

Metal frames in zig-zag are more durable but their cost is higher. The open frame assists self cleaning but they will still be found to clog with the surface vegetation (Fig.3).

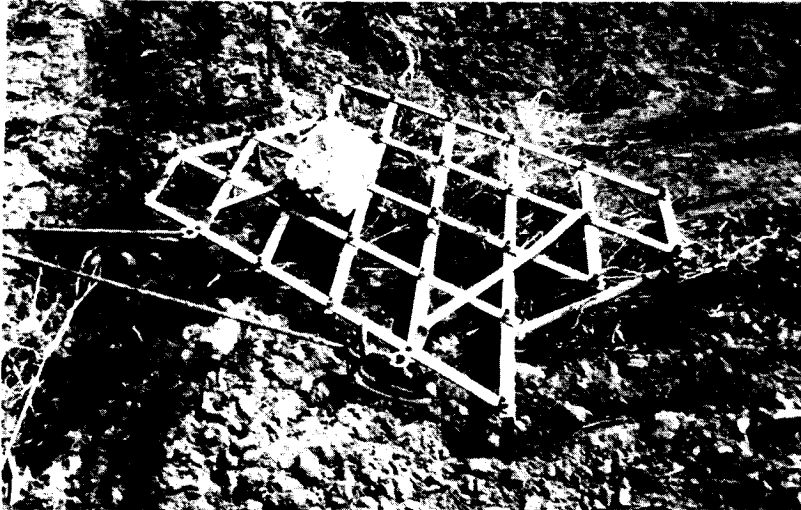


Fig. 3 A metal zig-zag harrow, heavily clogged, weighted down with a rock and incorrectly pulled at an angle. Even this simple tool must be correctly used.

Photo: J.E. Ashburner

The Indian blade harrow has a single row of between 5 and 7, wooden or metal blades set into the beam (Fig.4). This penetrates to some 4 or 5 cm and several passes are required to mix the soil.

This harrow is widely used in the semi-arid areas of both India and Pakistan and has been introduced to certain regions of Malawi.

CORRECT HITCHING OF THE HARROW

As was shown in Fig.3, correct hitching of this simple implement is very important to achieve best results. The size of the animals and the length of the pull chain affect the way in which the harrow floats across the surface. The implement should be about 1 metre behind the animals hooves and remain level in work (Fig.5).



Fig. 4 A simple blade harrow in use in Pakistan It provides a shallow soil disturbance but results in an acceptable seedbed.
Photo: J.E. Ashburner

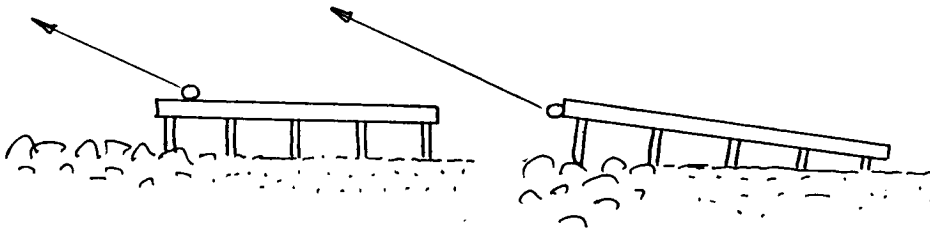


Fig. 5 A correctly drawn harrow (left) and incorrect adjustment (right). The harrow should remain almost level in work with all points working equally deep.