GOVERNMENT OF HARYANA

TECHNICAL NOTE NO. 4

SOIL WORKING

Issued by
CHIEF CONSERVATOR OF FORESTS, HARYANA

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Introduction

4.1 Soil working is one of the most important operations in a plantation programme. Good and thorough soil working is essential to establish the plants and to promote their growth. The soil working depends upon the climate, topography, soil and the method of propagation.

4.2 Keeping these factors in view, the following physiographic zones are recognised in the State :—

A— Shiwaliks.

B— Alluvial Plains.

C— Sandy Plains

D— Sand Dunes

E— Arravali Hills

A—Shiwaliks

4.3 The soil working technique is designed to provide a seed bed and also as a measure of soil and water conservation.

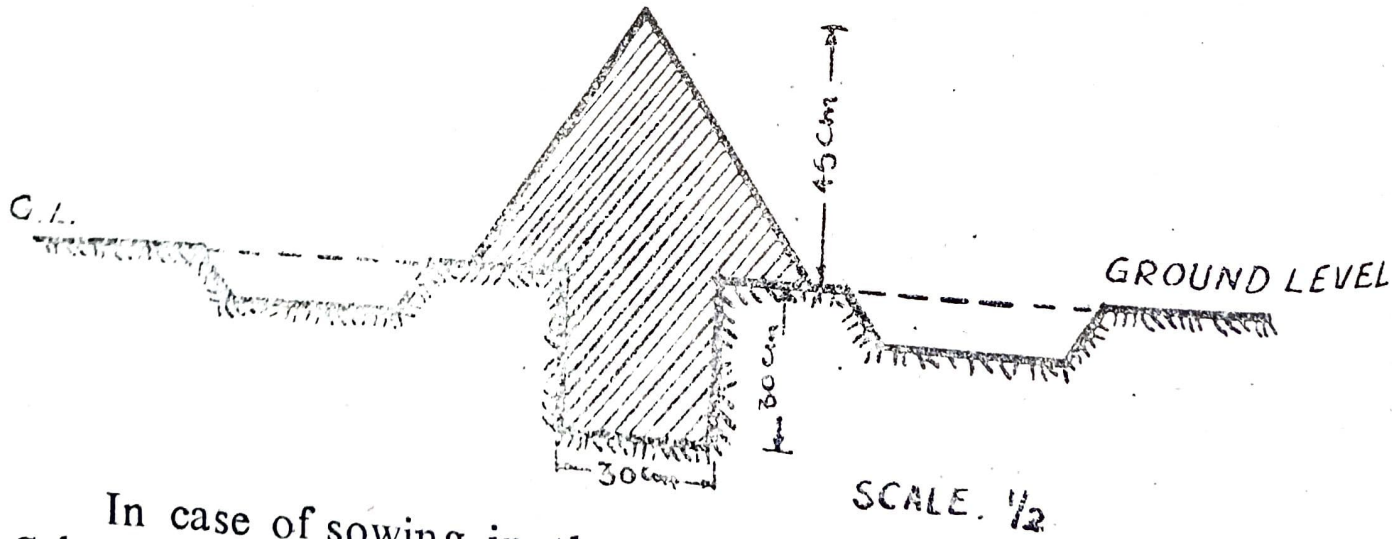
4.4 **Contour trenches**—These are made on relatively uniform slopes having a slope not exceeding 30°. Trenches are 2 metres long with a cross section of 35 cm × 35 cm. These are spaced 5 metres apart from centre to centre in the line and the lines will be 3 metres apart on an average. The contours are laid with the help of a contour frame fitted with a spirit level. The trenches are staggered in a manner that the gap between two trenches in a line is covered by the trench in the next line down slope. The trenches are laid starting from the ridge down hill.

The soil working is carried out during the winter so that fine soil is collected in the trenches as a result of winter rains. The dug up soil is heaped in the shape of a ridge along the lower edge of the trench leaving 10 cm berm. The berm is also used for sowing after soil working. At the time of sowing the fine soil collected in the trench is removed and spread on the berm.

45. **Pits**--The pits are dug on broken slopes or areas having more than 30° slope or for planting. The cross section of the pit is 45 cm × 45 cm and depth 30 cm. In practice the top dimensions are increased to facilitate digging to the required depth with a lower cross section at the bottom. The pits are spaced 3m × 3m It is preferable to carry out soil working during the winter. The soil is refilled at the time of sowing/planting after removing all the stones and gravel. The pits will slope towards the hill side after the filling so that maximum water may penetrate. The soil left out should be heaped in the form of crescent shaped ridge on the down hill side of the pit. Pits of the size 30 cm × 30 cm × 30 cm will be made on very steep and badly broken hill slopes. Other specifications in this case will be the same as above.

B—Alluvial Plains

4.6 **Trench and Ridge (Double trenches)**--These trenches are used where sowings are to be carried out. Continuous trenches are dug with a cross section of 30 cm × 30 cm preferably after the winter rains. The trench is refilled just before the sowing and side trenches with cross section 30 cm × 15 cm are dug on both side sand the dug up soil is heaped over the refilled trench to form a ridge about 45 cm high. The top of the ridge should be flattened to a width of 10 cm and lightly compacted. All the clods are thoroughly broken and grass removed while refilling the trenches. The sowing of seed is done on the top of the ridge. This technique is applicable to the road strips, railway strips, level canal strips and compact blocks in the plains. A cross section of the refilled trench is given below :—



In case of sowing in the block forests under Farm Forestry Scheme, the continuous double trenches described above will be spaced 5m from centre to centre.

4.7 **Single trench**—It is used for sowing along Canal Patries. A continuous trench of a cross section 30×30 cm is dug preferably after winter rains. Soil is refilled to form a low ridge just before sowing. Clods are to be thoroughly broken and grass removed before refilling. The trench is located 30 cm above the toe level to prevent damage by floods from adjoining cultivated fields. The top of the ridge is made level and compacted for sowing.

4.8 **Narrow terrace**--It is used for sowing on embankment of drains and bunds. A narrow terrace about 30 cm wide is made sloping inside. Soil working is done to a depth of 30 cm. The terrace is ordinarily continuous but can be interrupted where embankment is undulating and not properly dressed. The sowing is done in the middle of the terrace. These terraces are made just before the sowing. The number of terraces will depend upon the length of the slope. The terraces will be spaced 3 m apart from centre to centre.

4.9 **Pits**--These are used for planting container plants, the size of the pits being 45cm×45cm×45cm. The pits are spaced 3m×3m. The dimension at the top will be relatively larger than the bottom to facilitate digging upto the required depth. The pits should preferably be dug after the winter rains. The pits are refilled before planting leaving a trough 10 cm deep. Before refilling, the clods should be thoroughly broken and grass removed. These pits are used for plants raised in polythene bags.

In case of planting in block forests under Farm Forestry Scheme the above pits of the size 45×45×45 cm will be spaced 4 m×4 m from centre to centre.

In case of stump planting along the *cho* banks the pits of 30. cm depth and with a cross section 25 × 25 cm will be dug. Other specifications will be the same except that the soil working will be done before planting.

Pits with a size 60×60×60 cm. are made for tall plants The remaining details for soil working are the same as above, except that these pits are spaced 7.5 metres apart.

4.10 **High mounds**—These are made on water logged sites, which are defined as areas where water stands during the entire rainy season and gradually dries in winter. The height of the mounds depends on the maximum depth of water and should not be less than 15 cm higher than the highest flood level. Ordinarily

the size of the mounds will be of 50 cm diameter, at the top 170 cm, at the bottom and 60 cm in height. However, the dimensions can be increased upto a bottom diameter of 200 cm and a height of 75 cms according to the situation. The mounds will be spaced 5m×5m centre to centre. A shallow trough will be made at the top. The mounds are made just after the water dries out completely and soil is still moist for easy digging.

4.11 **Low mounds**--These are used for planting in saline-alkali soils. A pit 1×1×1 metre is dug at a spacing of 5×5 metres from centre to centre. The saline soil thus, dug out is thrown away from the pit. Good quality soil is transported from outside and filled in the pit so as to form a mound 30 cm. above the ground level. Planting is done on the mound after making a shallow trough. The technique is used in mild kallar soil having PH not exceeding 9 and soluble salt contents not exceeding 1%. Heavy Kallar sites will not be treated in this manner. The pits are dug preferably after winter rains and filled at the time of planting.

C--Sandy Plains

4.12 **Pits**--These are used for planting container plants. The size of the pits will be 60×60×60 cms. The pits are spaced 4 m×4 m The dimensions at the top will be relatively larger than the bottom to facilitate digging upto the required depth. The pits will be dug before the planting season and refilled before planting, leaving a trough 15 cm. deep. Before refilling clods will be broken and grass roots removed.

For tall plants in avenue lines the pits will be 7.5 m apart.

The Trenche and ridge (double trench) will be used for sowing. The technique will be the same as described under para 4.6 except that trenches are made before the rainy season.

D--Sand Dunes

4.13 **Earthen Bund**--On the periphery an earthen bund will be made which will serve as fence as well as site for castor sowing. The bund will be 1 m high, 2 m wide at the base and 1 m wide at the top. The top will be lightly dressed before sowing.

4.14 **Pits**--Pits will be dug as described under para 4.12 at a spacing of 6m×6m.

E--Arravali Hills

4.15 **Trenches**--These will be made 1m long with 30 cm × 30 cm cross section. The trenches will be spaced 3m × 3m from centre to centre. Other specifications are the same as described under para 4.4.

4.16 **Pits**--Pits of 45 cm cube dimensions should be dug at 3 m × 3 m spacing.

4.17 For soil working in Irrigated Plantations see details in Technical note on Irrigated Plantations.

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