

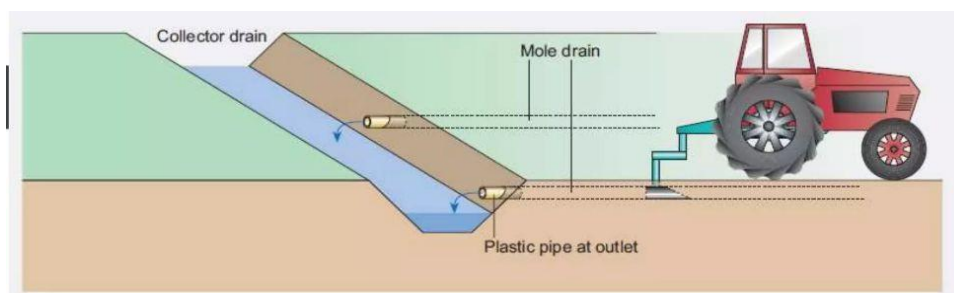
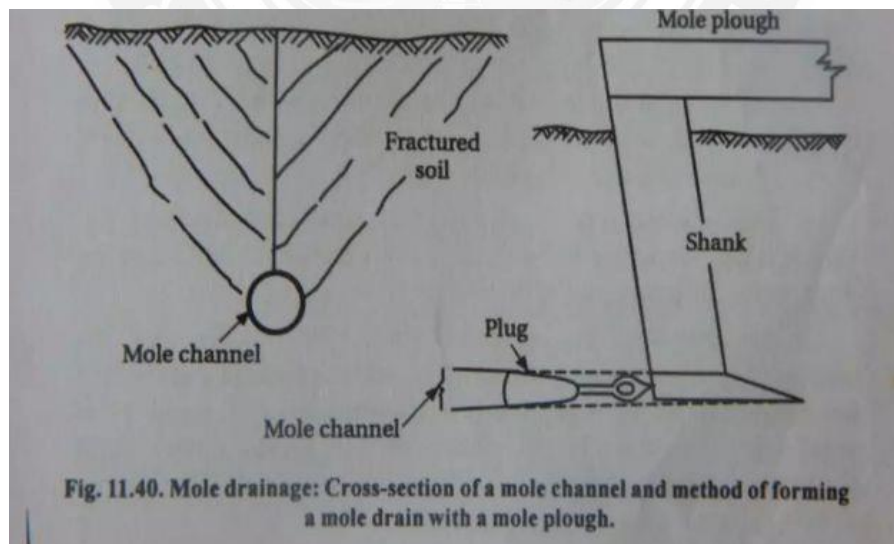
### 5.3 TILE DRAINS

**Tile** drains are made with **clay and concrete**, Tiles should be strong enough to withstand the pressure and also resistant to erosive action of chemicals in soil water.

**Mole** drains are unlined circular **earthen** channels formed within the soil by a mole plough.

- A mole drain is an unlined underground drainage channel, formed by pulling a solid object, usually a solid cylinder with a wedge-shaped point at the end, through the soil at the proper slope and depth, without a trench having to be dug.
- Mole drains are produced in the subsoil by means of mole plough. These are pipe less drains.
- Mole drainage is applied only under very specific conditions, mainly in stable clayey soils.
- The effect of mole drainage is a rapid removal of excess water from the surface layers, rather than at controlling the water table as such.
- The mole drains have a life span of only a few years(usually 10-15 years) and have to be renewed frequently.
- Depth of mole drain vary from 45-120cm depending upon moling equipment
- The length of mole drain is decided by length of affected area, soil type, availability of outlet etc. Safe length vary from 20-80 metre. If soil condition permits, the maximum length can be about 200 m.
- Smaller diameter have longer life than larger diameter. Diameter varies from 7.5 to 15 cm.
- Mole drains are closer spacing than tile drains. A spacing of 2 to 5 metres is usually followed.

- Safe gradient of 0.2-3% are given. Too low a velocity prolongs saturation of the drain and high velocity causes erosion.
- Stagnation of water in the mole drain will weaken the walls ,leading to deterioration of the channel.
- Mole drain finally discharges into an open ditch and therefore, last portion of the mole should be provided with the pipe.



- Mole outlet protection comprises of a 1-2m long pipe inserted into the mole channel
- Clean gravel of size 3-5mm are suitable.
- Ideal time for laying mole drain is soon after harvest of the crop.
- Extensively practiced in England, Western Europe and New Zealand.

**AI3602 IRRIGATION AND DRAINAGE ENGINEERING**

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