



Figure 3- A mole plow with a shank and cylindrical bullet that creates the mole channel in the soil (Photo credit: Patrick Tuohy).



Figure 4- A tractor pulling a mole plow. The shank creates a blade-cut to break up the plow-pan and compacted surface layer to improve infiltration and aeration (Photo credit: Patrick Tuohy).

6.2. Use a muck pipe with large perforations

Drain pipes with rectangular-slotted perforations present the greatest risk of ochre clogging. Rectangular slots come in two general types: regular-perforated and sand-slot pipes. The issue with these pipes is that ochre bacteria can bridge the narrower slot width quickly. Instead, use a muck pipe with large circular or oval perforations to extend the time before the perforations get clogged (Figure 5) (Bryant and Shaw, 1988).

6.3. Use a knitted-sock envelope

Soil with low clay and organic matter may cause a drain sedimentation problem because soil particles do not stick together (noncohesive or weakly cohesive). Example soils that can be a problem are sand, loamy sand, sandy loam, loam, silt loam, and silt. To determine if sedimentation is a problem for your drain pipes, see Ghane (2022).

In a sandy soil with both drain sedimentation and iron ochre problems, use a muck pipe wrapped with a knitted-sock envelope instead of a sand-slot pipe (Figure 5). Synthetic thin envelopes perform better than sand-slot pipes under iron ochre condition (Gameda et al., 1983). Among all synthetic envelopes, a knitted-sock envelope performs better with iron ochre (Stuyt et al., 2005).

Typically, the sock-wrapped muck pipe is available up to an 8-inch diameter as a single-wall corrugated pipe. For a larger diameter main pipe, use a dual-wall smooth interior sand-slot pipe (section 6.5).



Figure 5- A muck pipe wrapped with a knitted sock envelope. The muck pipe has large oval perforations that reduce the chance of iron ochre clogging compared to narrow slotted pipes.

9. Summary and recommendations

An Iron ochre problem occurs mostly in sandy and muck soils. There is no simple solution to fully address an iron ochre problem. First, identify the risk of iron ochre. Then, perform mitigation methods along with continuous maintenance and special design considerations.

Some of the mitigation and removal methods have limitations and may not fully address the ochre issue. Eliminating the oxygen supply is the most effective method that should be used along with other methods to keep ochre under control.

Expert Reviewed

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