Design of Mole Drain Spacing Using Hooghoudt's Equation

A Sambaiah, M Raghu Babu, G Ravi Babu, S B S Narasimha Rao, G V Lakshmi and B Bapuji Rao
Department of Soil and Water Engineering, College of Agricultural Engineering, Bapatla.

ABSTRACT

There is little literature and guidance available on design of mole drainage spacing, except that an empirical approach for selection of the spacings. In this, context, the present study attempted to apply the Hooghoudt's equation for design of the spacing by considering additional assumptions of preferential flows and radial flow concepts. Further, the bulk density of the soil below mole drains becomes more than the soil slabs above mole drains due to which the soil slab just below the mole drain behaves as a relatively impervious layer and the concept of equivalent depth can be waived in case of mole drains. This has facilitated using the direct depth to relatively impervious layer in the design of spacing using Hooghoudt's equation. The design of the mole drain spacing under the four scenarios revealed that to handle higher drainage co-efficient rates of 55.6 mm d^{-1} and 27 mm d^{-1}, the mole drain spacings in 0.4m depth condition are calculated to be 2m and 3m respectively and in 0.5m mole drain depth condition, they are 2m and 2m only. It can be concluded that the Hooghoudt's equation with additional assumptions facilitated, successful design of mole drain spacing for draining out the rapid flows that occur through the fractures formed due to mole drainage systems installation. It is also found that higher the drainage co-efficient, closer the spacing and deeper the depth, closer will be the spacing, despite 51.4 per cent reduction in drainage co-efficient.

Key Words: *Mole drainage Co-efficient, Return period, SCS-CN method, Sugarcane, waterlogging, Weibul's method*