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## Houses, Septic Systems and Soils

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# AGRONOMY GUIDE



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## Houses, Septic Systems and Soils

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Trees, green lawns, room to live, space for the family -- these ideas are attracting an ever increasing number of people to the suburbs. The possibility of lower taxes, investment for the future and an almost certain rise in land prices and building costs are stimulating this movement.

Most suburban-country or farm homes use septic systems for their sewage disposal. Thirty-six percent of all American homes do. These systems use the soil to absorb the septic effluent which is distributed by tile in trenches or beds.

It is estimated that an average of 80 to 100 gallons of water are used in a home per person per day. This adds up to 150,000 to 180,000 gallons per year for a family of five. Most, if not all, of this water must pass through the septic system into the soil. When soil conditions are not suitable, failures occur. These failures range from non-operating home facilities to contamination of local water supplies. A knowledge of some of the soil's characteristics will help identify possible problem areas and hopefully increase the chances of design of a suitable system.

The following pointers will help identify some soil characteristics related to the success or failure of septic systems.

### Soil Permeability

Permeability is the speed with which water enters and passes through a soil. It is influenced largely by the amount of clay, sand, silt and gravel in the soil and by the tightness or looseness of the arrangement of these particles. High clay or compact soil layers can slow down water movement until the soil cannot accept the daily volume of septic effluent. Morley, Blount, Vigo and similar high clay soils have very slow permeability in their subsoils.

A properly conducted percolation rate test gives an idea of the soil permeability. It is, however, very difficult to run to obtain reproducible results. The Indiana State Board of Health recommends that soils requiring more than 60 minutes for water to fall one inch in a percolation test hole should not be used for septic tile fields. Many soils of central and southern Indiana will have percolation rates at or above this rate.

### Water Table

Absorption tile will not work in a soil where the water table rises to the tile depth. The soil pores are filled with water and no room is left for septic effluent.

A water table problem is best observed in the spring when rains have filled depressions and poorly drained areas. A water table also may be found temporarily retained in the upper soil when tight clay or other subsoil layers prevent downward water movement.

It is sometimes hard to identify the depth to the water table because it rises and falls depending on the amount of rainfall an area receives. Prior to the development of housing, an area may be drained by surface and tile drainage. Thus, a high water table doesn't become apparent until after the subdivider has established grades for lots and roads and broken up the agricultural drainage.

The soil itself can tell us something about the presence of a water table. Well-drained soils without high water tables are a uniform brownish color 30 or more inches deep. High water table produces a "mottled" pattern to the color of the subsoil. Mottling is a gray background with spots of yellow, red or brown. The closer the mottling is to the soil surface the more serious the water table problem.

During the wettest season, water tables should be at least four feet below ground surface for a septic tile field. This definitely warns of the possibility of trouble in using somewhat poorly, poorly or very poorly drained soils such as Crosby, Avonburg, Brookston and Clermont.

#### Rock, Sand or Gravel

Bedrock should be several feet below the septic tile trench to allow for proper

construction and filtration of the effluent. In south central Indiana over cracked and creviced limestone this depth should be greater to prevent unfiltered effluent from seeping through to aquifers and contaminating wells.

Sandy or gravelly soils may not provide adequate filtration of the effluent. A heavy concentration of houses with septic systems on these soils could become a danger to shallow well water supplies in the vicinity.

These are a few of the factors which should be considered when evaluating an area for development on septics. A little serious observation when looking over a potential site may make the difference between a well-functioning system and septic failure. Sufficient information is not available to be able to guarantee a satisfactory or failing system on the basis of the soil information, but many useful indicators such as those mentioned above are present.

#### Future Information

Valuable information on soil suitability for septic tanks can be obtained from a soil survey, your county Cooperative Extension Agent or the Soil Conservation Service Technician in your area. Modern soil surveys published in the last few years contain information on the suitability of soils for septic tile systems. If a survey does not contain this information, it can be obtained from the local soil conservation office or the Agronomy Department at Purdue.