Vertical Mulching Boosts Root Growth

By WAYNE C. MORGAN

WHERE do roots grow? Under what environmental conditions are they active? The answers to these questions are of prime importance to persons having responsibility for establishing and maintaining landscape plants. Health and beauty of most plants are usually in proportion to the extent and vigor of the root system.

Roots do not grow into soil. They grow in the pore spaces surrounding soil particles. If there are only small pore spaces due to compaction and breakdown of soil structure, the physical barrier of dense soil will restrict root elongation.

Roots do not grow where it is too dry. Neither do they grow where it is too wet. They grow only where there is a favorable soil-moisture-air relationship. Water penetrates very slowly into and through clay, silt, and compacted soils. With restricted water movement into the deeper rooting zone of such soils, lack of sufficient moisture will not allow root growth. Where water has infiltrated, root activity will be limited because of excess moisture and insufficient oxygen in the dense soil.

Unwise irrigation practices can create conditions unfavorable for plant health. Water applied too fast runs off rather than entering the soil. Shallow rooting is usually the result. Applying more water than needed not only is wasteful, but will severely limit roots from aiding top growth where poor soil conditions exist.

Backfilled Holes Help Restore Vigor

When faced with poor growing conditions, a method of drilling holes around trees or shrubs and replacing soil with an improved mix will probably help significantly to restore vigor and beauty to plants. Known as "vertical mulching," this method is similar to "deep-root feeding" and "perforated feeding," except that in the latter holes are not backfilled with an improved soil mix.

In vertical mulching, holes from 2 to 3 in. in diameter are drilled into soil beneath the plant's drip line, approximately one per square foot. These can

be from 18 to 36 in. or more deep, depending on plant size and possible depth of rooting. Holes should be slanted inwards toward the tree trunk. Do not drill holes within a few feet of large tree trunks, since care must be taken to avoid damage to larger roots.

Holes can be hand drilled with barrel augers, or mechanically drilled with tractor-mounted, generator-powered, or gasoline-powered augers. Some grounds managers use water as a source of power, with threaded pipe attached to a hose.

Fill holes with a soil mix consisting of approximately 60% of the soil at the site, 10% of a partially decomposed humus, 10% peat moss or similar material such as fir bark, and 20% of a long-lasting wood waste.

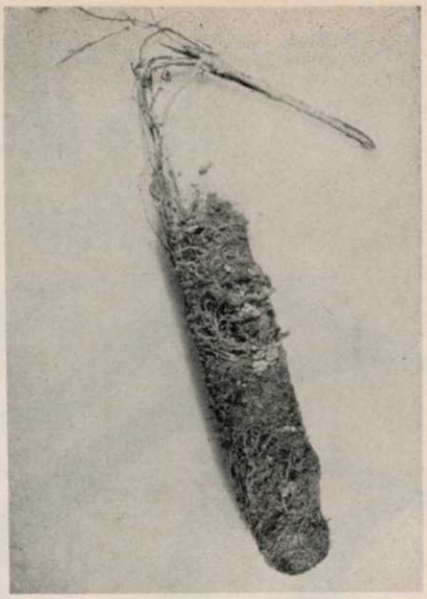
Humus provides conditions favorable to continued activity of soil microorganisms, which help to improve soil structure and nutritional benefits. Peat moss or fir bark is excellent for rooting but cannot withstand compaction.

Soil Must Be Kept Open to Air, Water

The long-lasting wood waste serves to physically hold the soil open. This permits easier water entry into and through soil and exchange of oxygen and carbon dioxide gases between the atmosphere and soil environment.

It has been suggested that sand or gravel be used to fill the holes. Though it is true that such materials will allow better air and water movement into the soil, the mix suggested here will fulfill the same basic function and also provide a favorable medium for root growth. In such coarse-texture soils as sands and decomposed granite, the soil mix will also add to moisture-holding capacity.

These holes must be left open to the soil surface. If they aren't, water movement in the soil may be restricted. Holes must also be within the plant's root area. Roots do not seek favorable air and moisture conditions; they only grow where such an environment exists.



Dramatic evidence that vertical mulching boosts root growth. Picture shows roots exhumed from a mulching cavity.

When the great value of landscape trees and shrubs is considered, it is apparent that they deserve the low-cost help vertical mulching can provide when poor soil conditions limit development.

Coming in March: "Can Trees Be Fertilized Economically?" by Drs. Dan Neely and E. B. Himelick. Part of a Special Fertilization Issue.

USDA Tests Show Greater Washoff of 2,4-D Ester

Recent Georgia tests conducted by scientists of the U. S. Department of Agriculture's Agricultural Research Service show that 2,4-D in the ester form is more easily washed from soil than amine formulations.

Using simulated rainfall, runoff from test plots was trapped and tested for herbicide content. Results showed that up to 27% of 2,4-D ester was washed off, but only 3% of the amine, indicating a close connection between herbicide form and loss from rainfall.

Lower amine loss was attributed to its much greater water solubility, which enables it to penetrate soil more readily than ester forms. Tests were conducted at experimental plots in Watkinsville, Ga., with cooperation of the Georgia Agricultural Experiment Station.