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# Tree Life-Saving with Compressed Air 

By CHARLES F. IRISH* Arborist for the Village of Bratenhal, Ohio HE use of compressed air has been found very beneficial in improving the vigor of trees on areas over which fills have been made. The reason for the beneficial effect of the aeration of tree roots is readily understood when we consider the very unnatural condition under which most of the ornamental trees in our cities are existing.

Nature in the forest covers the forest floor with a loose, spongy litter of decaying leaves. Such a condition is ideal for the development of root growth. It conserves the moisture, supplies food, protects the roots from frost injury and draught, and prevents the soil from baking or packing. It permits the entrance of oxygen into the soil and the diffusion of toxic gases into the air.

The truck growers and florists by cultivation and fertilization establish a condition similar in effect to that which exists in the forest. It is not always practicable to maintain the mulch of leaves as in the woods. The soil about many trees is tramped down until it is almost as solid as the adjoining pavement. This results in a loss of moisture by causing the rains to run off instead of penetrating. It prevents the free entrance of oxygen, and all plant life needs some oxygen; most of our ornamental tree roots require a considerable amount, the willow being a notable exception.

The lack of oxygen also limits aerobic bacterial action, resulting in the incomplete breaking-down of organic matter in the soil and in the formation of toxic compounds. The living roots and soil organisms throw off carbon dioxide as a result of their respiratory processes. In small amounts this is beneficial to the functioning of the roots, but an undiffused surplus inhibits and finally stops root action, eventually killing the roots.

## Method of Use

These conditions make many ornamental trees more susceptible to injury from insects and disease than they would otherwise be. The process of using compressed air as a remedy is very simple. It consists of boring holes to the desired depth, plac-

[^0]ing the air-gun in the hole and releasing the air. The depth to which the hole is bored and at which the air is liberated will depend somewhat on the particular conditions existing about the tree, the type of soil and the age and variety of the tree. Trees in some soils root deeper than in others. Then, too, there may have been changes in grade which should be considered. In the majority of cases a hole 18 inches deep will be found satisfactory. When the air is applied through the gun placed in this hole, the soil is fractured and as the soil gases are driven off a fresh supply of oxygen is driven in. We have observed under favorable conditions a penetration of over 6 feet in depth and 10 feet laterally. Fertilizer is then blown through the fractured soll.

A porous condition is established without any tearing-up of the surface soil. Sod will not be injured except for a few holes. The soll will more readily absorb water, which will, in turn, carry the fertilizer in solution to the trees. By using an oxidizing fertilizer, the beneficial soil organisms and processes are stimulated, with a corresponding stimulation in the growth of the tree, resulting in greater vigor, greater density of foliage, longer twig growth, and fincreased trunk size.

Trees well on the way to dying have been saved by this method. It has also been used to prove to gas companies that their mains are leaking enough to damage, or even kill, trees. The process is a simple one. The pneumatic gun is inserted into a hole drilled over the main and approximately to its depth, and the soll atmosphere and gas driven out through a second hole, frequently with such a rush that flame leaps three feet high, even though the usual tests have just failed to show any gas in the soil.

In brief, it is practicable by the use of compressed air to establish a soil condition about the roots of our trees similar in effect to that of nature or that established by cultivation.

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