

AIR POLLUTANTS ALSO DAMAGE PLANTS

By David B. Schroeder

Extension Plant Pathologist

A large amount of information is published daily on the adverse effects of air pollutants on man. Not so well publicised are the harmful effects of pollutants on green plants; plants which are essential for man's survival on earth.

Air pollution damage to plants, especially around certain factories, has been known for over a century. With industrialization and urbanization, more and more examples of plant damage by pollutants are apparent. Presently, economic losses through crop damage due to air pollution are increasing annually. Losses due to growth suppression, crop failure and changes in quality have been estimated to be between \$325 and \$500 million annually in the United States.

One reason the above figures are not higher is that air pollution damage to plants is difficult to diagnose. In some instances the effects of pollutants are very dramatic and obvious. Spotting, blotching or bleaching of the leaves and occasionally death of all or part of the plant may occur. This is usually the case in the vicinity of large cities, power generating stations, smelters and other industrial sites where concentrations of specific pollutants are high. However, far more common is injury resulting from long term exposure to low concentrations of pollutants. Often this injury is not obvious and shows up in the form of chronic growth suppression, lowering of yields, and early death of the plant.

The majority of air pollutants causing injury to plants are gases. Some of the more common of these are hydrogen fluoride, nitrogen dioxide, ozone, peroxyacetyl nitrates and sulfur dioxide.

In the Northeast, ozone is and will continue to be the most important plant damaging air pollutant. Exhausts of automobiles and other internal combustion engines are the most important sources of ozone.

The most common symptoms of ozone injury are a light colored stippling, mottling or flecking of the upper leaf surface. Petunia, chrysanthemum, orchids, zinnia, sweet pea and many other species of greenhouse plants have exhibited ozone damage in New England.

Although national air quality standards have been set and scheduled for enforcement in all states by 1975, some plant scientists question their adequacy, particularly in regulating against damage to plants. It appears that the Environmental Protection Agency Standards are not stringent enough to prevent injury to susceptible plants from gaseous pollutants, especially ozone.

Possible solutions to the problem might be an eventual tightening of the standards plus an extensive effort to find alternative systems of transportation which will tend to decrease our present dependence on the automobile.

Plant scientists are also attempting to develop varieties of plants resistant to air pollutants and are investigating chemicals which improve the resistance of some plants to pollutants.