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Environmental Engineering Air Pollution and Control

The Phytotoxicity of Designated Pollutants on Plant Species

Authors: [A. L. Granett](#); [CALIFORNIA UNIV IRVINE](#)

Abstract: A ground cloud is formed as the space shuttle rocket lifts off. The phytotoxicity of products released from this cloud was studied. **Aluminum oxide** dust and droplets of hydrogen chloride (HCl) were found on leaves of plants at the Kennedy Space Center following launch. The nontoxic nature of **aluminum oxide** was confirmed in laboratory tests. Acidity of the mist was more important than the length of exposure. Leaves were the most likely part of the plant to be injured with lower surfaces being more sensitive to damage than upper surfaces. Small depressions formed on lemons exposed to 1% HCl mist, but ripe tomatoes remained undamaged by the same exposure regime. Zinnia flowers were sensitive to injury, but radish roots were not reduced when plant tops were exposed to the mist. Biomass of other plants were reduced only slightly when plant tops were exposed to the mist. Biomass of other plants were reduced only slightly by single mist exposures. Marigold plants were exposed to HCl mist during different periods of flow development. Only seeds collected from these flowers exposed during pollination had reduced germination rates. In summary, plants are sensitive to HCl mists but the acid concentration must be high to cause serious visible injury. Although such concentrations are present in mist deposited from a launch ground cloud, actual numbers of plants exposed would depend on climatic conditions. Detecting foliar **aluminum** deposits may provide evidence that the ground cloud passed over certain vegetation.

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