

Toomer's Oak Update March 31, 2011

Soil Sample Results: Background. On February 21 and 22, soil was removed and replaced in the beds surrounding the Toomer's oaks in an attempt to remove as much of the herbicide as possible. Soil samples were taken during the excavation process to help determine the depth the herbicide had reached in the beds. The upper 20 inches of soil was removed, which is below the trees' mass of feeder roots, and below which the herbicide was likely to have penetrated, according to the manufacturer.

Test results from samples taken during soil removal indicated that herbicide levels were very high even at the 20-inch depth, where it was expected to be much lower. The university then sampled undisturbed soil from 20 to 26 inches deep in the beds, and results indicated the herbicide was present at high levels at that depth.

How deep the herbicide may have penetrated is impossible to determine; however, to prevent roots from growing into this contaminated soil or the herbicide moving in the soil solution into root zones, Auburn contracted with American Plant Services (APS) to remove soil from the beds at greater depths. Work commenced on Friday, March 18 and was completed on Tuesday, March 22. Uncontaminated soil added after soil was removed in February was removed by AU Landscape Services and APS. APS then loosened soil from around the roots using high water pressure, and vacuumed the soil/water slurry into a containment truck. The depth of soil removed varied with the root density. For example, the dense root mass present within the boundaries of the old concrete curbing removed two years ago contained little soil in the upper foot; this soil was removed but removal of soil below the root mass was not possible. Outside the dense root mass but within the beds, soil was removed as deep as 47 inches below the top of the granite curbing.

Following soil removal core soil samples were taken into undisturbed soil in each quadrant of the beds by driving galvanized pipe about 13 inches into the ground. The pipe was removed and cut into two equal lengths, and the samples labeled by bed, quadrant, and depth (upper or lower), and analyzed by the AU Mass Spectrometry Lab in the Department of Chemistry & Biochemistry.

Latest Soil Test Results. Prior to the second soil excavation, tebuthiuron levels in undisturbed soil in the two beds averaged 4994 ppb and were as high as 14,079 ppb in one quadrant. In the 15 samples taken from undisturbed soil in the bottom of the two beds following the second excavation, tebuthiuron was not detected in seven samples. Tebuthiuron levels in the remaining eight samples averaged 61 ppb, a 98.8% reduction compared to levels following the first excavation. What does this mean? First, that the vast majority of herbicide still present after the first excavation was removed during the second excavation. Second, because soil was removed from much of the beds well below where active roots are located, further herbicide uptake by roots in the beds should be minimal. Does this change our outlook on the survival of the trees? These test results are good news and warrant cautious optimism. However, the over-riding unknown is, "How much herbicide was absorbed by the tree roots before we completed the removal of contaminated soil?" We can only speculate and continue to monitor shoot growth as spring progresses.



Soil was removed to a depth of 47 inches from the College Street bed. Following soil removal, pipe sections were driven into undisturbed soil in each quadrant to retrieve soil samples



Sample pipe section after removing it from the bed (left); pipe sections were cut to provide equal lengths of the soil profile and were labeled 'upper' and 'lower'



Upper and lower soil samples taken from undisturbed soil.