

LYSIMETERS FOR STUDYING THE FATE
OF NITROGEN AND PESTICIDES

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Two intact soil monolith lysimeters were installed at the Hancock Turfgrass Research Center at Michigan State University during 1989-90. The lysimeters were cylindrical in shape, 1.14 m (45 in.) in diameter (1 m² surface area) and 1.2 m (48 in.) in depth. The intact monolith was captured by careful soil excavation and application of downward pressure to the open-ended lysimeter fitting it tightly around the column of soil. The monolith was removed and inverted, the bottom was attached, and the lysimeter was placed back into the ground with an adjacent "manhole" to allow access for sampling. This intact monolith will allow for quantitative collection of percolate through an undisturbed core of soil that represents as accurately as possible leaching conditions in the field. With this method, measurements of concentration and total amounts of materials leached are possible. Two additional lysimeters will be installed during 1991. Adjacent microplots were established to be used for destructive soil sampling in which partitioning to soil mineral, organic, and microbial fractions can be studied. The area was sodded to a blend of three Kentucky bluegrass cultivars and will be maintained as a high maintenance lawn area. Studies on nitrogen cycling and pesticide fate will be initiated in the lysimeters. Initial studies have shown that overall water flow through the two lysimeters agrees within 1%. Studies with bromide and chloride tracers indicate that leaching potential of anionic species may differ between the two lysimeters due to macropore flow. This difference can be attributed to natural variability in soil structure in the field and is, therefore, representative of the variability in leaching potential. Macropore channels can be altered by freeze-thaw cycles or other natural occurrences. These lysimeters are designed to be extremely durable and should be in place for many years, allowing for the establishment of a database for leaching potential of fertilizers and pesticides in soils of this type.