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TESTS OF A SYSTEM TO EXCLUDE ROOTS FROM BURIED RADIOACTIVE WASTE IN A WARM, HUMID CLIMATE

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DISCLAIMER

The information contained in this article was developed during the course of work under Contract No. DE-AC09-76SR00001 (now Contract No. DE-AC09-88SR18035) with the U. S. Department of Energy.

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ABSTRACT

Vegetation is commonly used to stabilize the ground covering buried waste sites. However, constituents of buried waste can be brought to the surface if the waste is penetrated by plant roots. An ideal waste burial system would allow the use of vegetation to stabilize the soil above the buried waste but would exclude roots from the waste. One system that shows considerable promise is a slow release encapsulation of a root growth inhibitor (Trifluralin). Projected lifetimes of the capsule are in the order of 100 years. The capsule is bonded to a geotextile, which provides an easy means of distributing the capsule evenly over the area to be protected.

Tests have been conducted in a rhizontron, in glass-walled field trenches in established forest vegetation, and in large pots. In all cases the barrier has excluded roots from the zone of soil below and/or immediately surrounding the biobarrier. Measurements of Trifluralin concentration in the vicinity of the biobarrier show concentration greater than 5 $\mu g/cm^3$. At this concentration the roots of virtually all species of vegetation should stop growing. Concentration of Trifluralin is below detection at distances greater than 10 in. above the biobarrier.

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Vegetation grown in the soil above the barrier has provided good ground cover, although some decrease in growth has been found in some species. Of the species tested the sensitivity to the biobarrier, as measured by the distance root growth stops near the barrier, is bamboo> bahia grass> bermuda grass> soybean.

Potential uses for the biobarrier at the Savannah River Site (SRS) include the protection of clay caps over buried, low-level saltstone and protection of gravel drains and clay caps over decommissioned seepage basins. Trails of the biobarrier as part of waste site caps are scheduled to begin during the next 12 months.

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