

Plant Growth in Sandy Soil/Compost Mixture and Commercial Peat Moss both Amended with Illinois Coal Fly Ash

Sheng-Fu J. Chou¹, Mei-In M. Chou^{1,2}, Joseph W. Stucki², Daniel Warnock², Joseph A. Chemler¹, and Mark A. Pepple¹

¹Illinois State Geological Survey, 615 E. Peabody Sr. Champaign, IL 61820:

²University of Illinois, Dept. of Natural Resources and Environmental Sciences, Urbana, IL 61801

KEYWORDS: fly ash, sandy soil, plant growth

ABSTRACT

Burning coal for energy produces a by-product known as fly ash. Fly ash is not currently regulated as a hazardous material by the US EPA and is discarded as waste to ponds or landfills if no other uses can be found. Successful value-added applications would help to reduce the cost and concern of fly ash disposal. Fly ash contains minerals needed for plant growth, but has high surface tension with high water holding capacity. This study examined the potential benefits of using a high pH (>8) Illinois coal fly ash to amend growth media for tomato plants, turf-grass, and chrysanthemums. Both turf-grass and tomato plants were grown in sandy soil/compost/fly ash mixed media with fly ash at 0, 12.5, 25, and 37.5 v% respectively, while chrysanthemums were grown in commercial peat moss/fly ash mixed media with fly ash at 0, 25, 50, 75, and 100 v% respectively. In each case the plant height, soil pH, electrical conductivity, and appearance were monitored. The results of this study indicated that Illinois coal fly ash could be beneficial to typical plant growth if it is applied at an adequate rate and to an acceptable medium, but further case-by-case detailed evaluation is warranted.

Submitted for consideration in the 2005 World of Coal Ash, April 11-15, 2005, Lexington, Kentucky, USA.