

AGROFOREST MANAGEMENT SYSTEMS CAN PRODUCE BIOFUEL FEEDSTOCKS AND IMPROVE KEY ENVIRONMENTAL SERVICES ON RETIRED AGRICULTURAL LANDS IN THE WESTERN GULF REGION

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To meet federal and state biofuel mandates in the United States, production of crops used as biofuel feedstocks must dramatically increase. Increasing biofuel production capacity will necessitate bolstering biofuel production from corn and soybean in the Midwest with crops grown in other regions of the country and with crops other than those conventionally used as biofuel feedstocks. However, dramatic expansion of lands used for agriculture could degrade environmental quality. Clearing forests reduces carbon sequestration and alters wildlife habitat. Increased fertilizer use associated with agriculture can lead to nutrient pollution of waterways. Agroforest management systems in which crops are harvested annually as biofuel feedstocks are grown in alleys between trees and can be used to enhance wildlife habitat and carbon sequestration of forests while producing biofuels. These systems have relatively low water and fertilizer requirements due to efficient allocation of growing space and site resources. Agroforest systems diversify farm markets and reduce economic risks of entering the biofuel market. Agroforest systems also provide key ecosystem services, such as increased carbon sequestration, reduced nitrogen pollution of waterways, and increased wildlife diversity. Fertilizer use could be further minimized by using such systems to produce switchgrass, a nutrient-efficient perennial grass with high biomass growth potential, as a biofuel feedstock. The Western Gulf region of the United States has abundant land that has been retired from agricultural and pastoral production due to changing economic or social trends. Producing biofuels on such lands with agroforest systems can enhance environmental services currently provided by such lands while increasing regional biofuel production. The information presented will discuss: (1) designs of these ecosystems, with concerns related to establishment, production, and harvesting; (2) likely impacts on soil and water quality and carbon sequestration; and (3) the potential influence of these systems on biodiversity in the Western Gulf region.

KEY WORDS: agroforestry, switchgrass, cottonwood, pine, biodiversity, nutrient cycling

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