



# bio mass energy center

## Presents:



### "Potential of Cattails as Energy Crop for Biofuel Production"

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124 Ag Engineering Bldg.

The best energy crop may be the one that grows in marginal lands, does not require much input in the form of fertilizer or chemical, and provides a high yield in the form of tons of biomass or gallons of fuel per acre. Cattails, which grow in swampy marginal lands and produce high yield of starchy roots below ground and high yield of ligno-cellulosic biomass above ground is such an energy crop. Cattails can produce a total alcohol yield of about 8,690 liters per hectare per year from rhizomes and above-ground biomass.

North Carolina raises about 10 million heads of hogs per year and this generates millions of tons of hog waste that need to be disposed of. Cattails can be used to absorb much of the nutrients from the swine waste distributed throughout rural NC and produce large amounts of energy crop in the process. Furthermore, NC has 300,000 acres of marginal lands under conservation reserve program (CRP) which can be used to produce cattail as energy crop. In turn, cattails can be converted to ethanol as an alternative transportation fuel.

Pretreatment of the dried cattails with dilute NaOH was followed by solid-liquid separation and enzymatic hydrolysis and fermentation of the solids. Two trials gave an average conversion efficiency of 43.4% for the pretreated solids alone which, in conjunction with the average crop yield for the cattails, would give up to 4,012 liters ethanol per hectare, a favorable comparison with corn stover's 1,665 L/ha at a 60% conversion rate. Assuming the high biomass yield and 60% conversion efficiency for solid and liquid streams, the expected alcohol yield would be 9,680 L/ha. Considering the social and environmental benefits obtained from the improved animal waste management system as well as reduced carbon emissions generated by gasoline use, cattails can be recommended as a potential feedstock for bioethanol production.