## *Regional Feedstock Partnership Highlights—South Central Region Biomass Resource Assessment*

A crop yield ratio model was used to estimate potential switchgrass yields for the South Central region. The details of the estimation were illustrated for the state of Oklahoma where the estimation covered 43% of the state's total land area. Three to eight crops (alfalfa, grain sorghum, corn, improved bermudagrass, wheat pasture, wheat, bluestem, soybean, and tall wheatgrass) were used for comparison. Total area for the top five soils in all Oklahoma counties was estimated to be 12.48 million acres. Top suppliers of switchgrass in Oklahoma were found to be in the Northeast, Central, Panhandle, and North Central crop reporting districts. These districts could potentially supply a total of over 14 million tons and can be referred to as the suitable areas for establishing future biofuel processing plants.

The same techniques were used to estimate yields in Arkansas, Colorado, Kansas, Louisiana, Missouri, New Mexico and Texas. Mean yield estimates ranged from a low of 1.8 tons/acre in New Mexico to 6.1 tons/acre in Missouri (Table 1).

An alternative model predicting switchgrass yield based on county level weather information was also developed and tested using Oklahoma's Mesonet weather data. The resulting estimates were rigorously compared to those from previous studies and to the crop yield ratio estimates. In general, estimates from the crop yield ratio model and weather data model were similar to each other and also consistent with previous studies. This further substantiates the use of the crop yield ratio approach. However, the weather data estimates were higher in counties with very low crop production. It is likely that, in these counties, the reported county average yields are not representative. In these cases, weather data-based yield predictions may provide useful alternative estimates. On a statewide basis the average yield for the weather data model was 4.1 tons/acre compared with 4.4 tons/acre for the crop yield ratio model.

The operations and costs of harvesting and collecting switchgrass were also modeled for both individual producer operations and for a 5-member harvesting cooperative. The total cost was projected at $21.35/ton for the producer and $18.20/ton for the cooperative, a significant cost savings for the biomass harvesting cooperative. Baling was the most costly operation ($6.18 to $7.27/ton) followed by mowing ($3.73 to $4.27/ton). Total costs for the harvesting cooperative were similar to costs projected for large industrialized operation in other studies. This suggests that biomass harvesting cooperatives may be a viable method for producers to participate in the biomass supply chain.

Table 1. Regional Switchgrass Production Estimates (tons/acre) by State

| State | Minimum | Maximum | Average |
|---|---|---|---|
| Arkansas | 3.4 | 6.6 | 5.5 |
| Colorado | 1.6 | 3.4 | 2.2 |
| Kansas | 2.8 | 7.0 | 4.7 |
| Louisiana | 2.5 | 7.2 | 4.9 |
| Missouri | 3.7 | 8.0 | 6.1 |
| New Mexico | 1.3 | 2.5 | 1.8 |
| Oklahoma | 2.1 | 6.1 | 4.4 |
| Texas | 1.7 | 5.1 | 3.0 |

Table 2. Summary of Operating Costs/Ton Switchgrass in Oklahoma

| Operation | Producer | Cooperative |
|---|---|---|
| Mowing | $4.27 | $3.75 |
| Raking | $1.16 | $1.17 |
| Baling | $6.19 | $7.25 |
| Equipment Transport | | $0.36 |
| Bale Collecting and Stacking | $5.33 | $3.13 |
| Bale Transport- Stacking to Warehouse | $4.40 | $2.59 |
| TOTAL COST: | $21.35 | $18.20 |

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