



The University of Georgia

Cooperative Extension Service

College of Agricultural and Environmental Sciences / Athens, GA 30602-4356

Volume 21, Issue 3

December 2005



FUEL AND ENERGY ISSUE

Even as oil prices have started to recover back to their pre-Hurricane Katrina levels nowadays, most analysts do not rule out the possibility of future radical upswings in oil prices, especially during the winter months.

In this issue, we feature four articles written by several faculty at the Department of Agricultural and Applied Economics on various topics related to the fuel and energy situation in Georgia. Don Shurley and Nathan Smith discuss the impact of fuel and energy prices on planting decisions of Georgia's crop farmers. Forrest Stegelin provides his views on what the fuel and energy outlook for 2006 will be. Michael Wetzstein and Barry Barnett discuss some fuel and energy-related issues and options that Georgia policymakers could consider. The fourth article by George Shumaker and John McKissick presents a description and analysis of recent efforts in the state that seek to develop alternative fuel and energy sources.

The Georgia Economic Issues Newsletter

IMPACT OF FUEL AND ENERGY COSTS ON CROP PLANTING DECISIONS

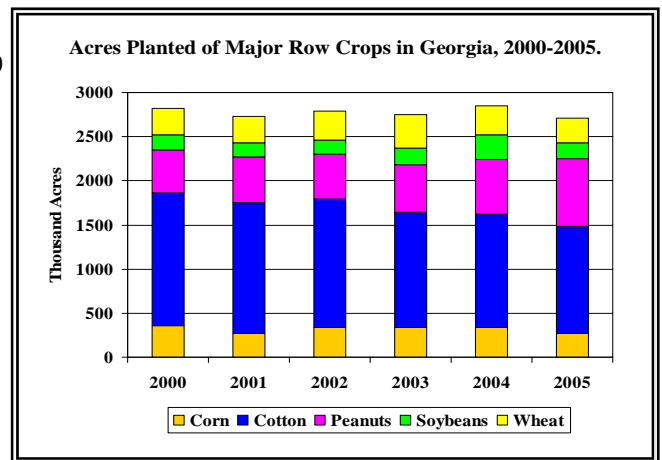
BY DON SHURLEY AND NATHAN SMITH

Many factors influence a farmer's decision of what to plant from year to year. Short-term profit maximization is rarely the sole criterion considered. Factors influencing the decision of what to plant would include relative expected net returns (expected yields, prices, government program payments, and costs), desirable longer-term beneficial crop rotations, risk management through acreage diversification, machinery and labor availability, and weather (the impact of weather on field conditions and planting timeliness).

The major cash row crops in Georgia in terms of both acreage and value are cotton, peanuts, corn, soybeans, and wheat. For 2005, Georgia farmers planted 1.22 million acres of cotton, 760,000 acres of peanuts, 280,000 acres of wheat, 270,000 acres of corn (planted for all purposes), and 180,000 acres of soybeans. Only 230,000 acres of all corn planted and 140,000 acres of all wheat planted was harvested for grain.

The state's cotton acreage peaked at 1.5 million acres in 2000 but has since declined approximately 19% due primarily to increased peanut acres since passage of the 2002 farm bill. Corn acreage has been fairly stable at around 300,000 acres. Soybean acreage, after increasing in 2004 due to expected higher prices for soybeans, declined sharply in 2005 to pre-2004 levels of less than 200,000 acres.

Higher fuel costs have been a factor in Georgia crop production since the 2004 crop season. Prices then increased markedly further during August-October 2005 due to hurricanes in the Gulf. Prices have since declined and appear to have stabilized. The farmer price paid for diesel fuel is believed to have averaged \$2.25 to \$2.50 per gallon during the 2005 growing season with prices



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Impact of Fuel and Energy Costs on Crop Planting Decisions (Continued from Page 1)

being higher at some times and lower at other times. Currently, the farmer price is \$2.00 or less per gallon. The outlook for the 2006 crop year is for prices to remain near current levels and potentially increase up to 15% due to increase in demand during the winter months. In addition to actual fuel costs, higher oil prices also impact the farmer through subsequently higher prices paid for chemicals, nitrogen fertilizers, and other "energy-related" costs such as crop drying and ginning.

It is estimated that fuel (diesel, gasoline, oil, and lube) costs comprise 8-12% of total variable (out-of-pocket operating) cost for Georgia major row crops (based on non-irrigated production). All "energy-related" costs (fuel, nitrogen fertilizers, chemicals, drying, and ginning) comprise 36-53% of total variable cost. These other "energy-related" costs may not increase at the same rate as fuel and oil prices and price increases (most notably for chemicals and nitrogen) may lag behind fuel cost increase due to time in the manufacturing process but these inputs/costs are impacted by higher fuel and oil prices.

Will higher fuel and related costs have an impact on farmers planting decisions ahead for 2006? In general, the answer would be yes if (a) one or a few crops are impacted significantly more than others, (b) if fuel/energy related costs outweigh all other factors in the decision such as expected yields, market prices, and other costs, and/or (c) if high costs result in limited financing and credit availability. In addition to planting decisions, higher fuel/energy costs could also impact choice and use of production practices (increased use of less energy-dependent practices) and/or result in marginally profitable acres exiting from production.

Preliminary Estimate of Per Acre Production Cost, South Georgia, Non-Irrigated, 2006

	Corn	Cotton	Peanuts	Soybeans
Estimated Total				
Variable Cost	\$191.61	\$360.63	\$418.58	\$157.47
Fuel Cost Only	\$15.45	\$32.01	\$53.74	\$17.95
All "Energy-Related" Costs	\$124.78	\$167.39	\$201.12	\$67.23
% Fuel Cost Only	8.0%	8.9%	12.8%	11.4%
% "Energy-Related" Cost	65.1%	46.4%	48.0%	42.7%

Comparison of Estimated Per Acre Net Returns, Non-Irrigated Production, 2006

	Corn	Cotton	Peanuts	Soybeans
Expected Price ¹	\$2.55	\$0.59	\$365	\$5.75
Expected Yield	85	675	2,500	30
Crop Income	\$216.75	\$398.25	\$456.25	\$172.50
Variable Costs	\$191.61	\$360.63	\$418.58	\$157.47
Net Return	\$25.14	\$37.62	\$37.67	\$15.03
Breakeven Yield²	75	611	2,294	28
Break-Even Price³	\$2.25	\$0.53	\$335	\$5.25

1/ Based on futures prices or expected contract price as of late November 2005. Includes LDP if applicable.

2/ Yield needed to cover Variable Costs at the price shown

3/ Price need to cover Variable Costs at the yield shown.

to result in major shifts in crop plantings. It is possible, however, that production practices altered to result in cost savings.

Planting decisions will depend on relative price expectations and costs at planting time. Corn acreage was down in 2005 as acres switched to peanuts. Although it appears potentially lower in expected net returns compared to cotton and peanuts, because it is planted earlier and because its total variable costs are significantly less, corn acreage could rebound somewhat. Lastly, farmers tend to weigh heavily their most recent experience. 2005 was a good year for cotton and not as good for peanuts. This could result in some reduction in peanut acres or at least much slower growth than in 2005. ©

The major costs for cotton and peanut production are seed, fertilizer, and chemicals. Fuel costs account for roughly 10.5% of total cost. Nitrogen is a significant cost in cotton and corn production that is not required in peanuts and soybeans. Fuel and total "energy-related" costs are similar for peanut and cotton production on a percentage basis.

Compared to the estimated average prices paid during 2005, average fuel costs are expected to be slightly lower in 2006. Chemicals and nitrogen costs are expected to be higher. Estimated net returns for 2006 favor cotton and peanuts based on the prices, yields, and costs assumed. Should peanut price approach the loan rate of \$355/ton, expected net returns would favor cotton.

Fuel costs are expected to remain historically high in 2006 although likely lower than during 2005. Higher prices for chemicals and nitrogen fertilizers are expected in 2006. These price trends, however, do not appear sufficient to alter farmers' acreage decisions independent of other factors. Although cotton and peanuts are high-cost enterprises, the energy cost situation is not expected that marginal acres could be taken out of production and/or production practices altered to result in cost savings.

Projected Acres Planted, Georgia, 2006 (Thousand Acres)

	2003	2004	2005	2006 Projected
Corn	340	335	270	275-325
Cotton	1,300	1,290	1,220	1,200-1,300
Peanuts	545	620	760	650-775
Soybeans	190	280	180	160-180
Wheat	380	330	280	275-300

ENERGY AND FUEL PRICES OUTLOOK FOR 2006

BY FORREST STEGELIN

The impact of rising energy costs in the fall of 2005 will not be fully felt until 2006, and beyond. The prices of oil and natural gas are big drivers of the increased costs for all purchased inputs. Rising energy costs affect most components of production expenses to some degree, if only through higher transportation costs. However, manufactured inputs (fuel, fertilizers, pesticides, and electricity) are directly affected by rising prices for crude oil and natural gas. While the effects of rising energy costs are significant, the expenses they affect most still account for only one-sixth of the farm sector's total costs of production.

Why are energy prices important for the agricultural income and financial outlook? There are three primary reasons.

- *First, energy related inputs, such as gasoline, diesel fuel, electricity, and fertilizer, account for an average 15-percent share of total production expenses.* For row-crop agriculture, i.e., cotton, wheat, corn, or soybeans, the fuels and fertilizer share of total expenses approaches 20-percent. Gasoline, diesel fuel, and natural gas prices paid by farmers are directly influenced by crude oil prices. Electricity prices, while not as directly and immediately responsive to crude oil prices, move up with oil prices over the long term as many of the electricity generating power stations rely on natural gas as the primary fuel source. Natural gas – the price of which is influenced by crude oil as industrial and commercial users substitute among energy sources – is key to the production of nitrogen-based fertilizer, especially anhydrous ammonia. Fertilizer prices rise sharply when natural gas prices soar.
- *Energy prices influence economic growth, driving domestic demand for the food and fiber generated by agriculture.* Economic growth is constrained by restrictions on available energy. There is widespread agreement that low energy prices contribute to the strong growth and low inflation experienced in the 1990s. This growth spurred continually increasing demand for Georgia's food and fiber products, supporting farm cash receipts.
- *Energy prices affect the growth of developing economies, which are increasingly important customers of US food exports.* Developing countries tend to focus on manufacturing so they are far more dependent on oil for growth than are developed countries, which rely relatively more on services. China, for example, requires five times more energy to produce one more dollar of gross domestic product than in the US. A large increase in energy prices has a significantly negative impact on economic growth in developing countries, which means smaller increases in farm exports.

Affective Response

The effects of the rise in energy costs observed in the third quarter of 2005 will be somewhat mitigated by the nature of farming activities in the last quarter of the year, as well as by farm operators' managerial practices and skills. The principal energy consuming activities in the fall of the year are harvesting and some on-farm drying of certain crops. A large number of farms have storage tanks for their fuels on the farm for the convenience of dispensing fuel as required. Consequently, these farmers purchase fuel in advance in order to have it when needed, as well as take advantage of bulk pricing at lower than retail pump prices. Therefore, much of the fuel consumed in the latter months of 2005 would have been purchased prior to the rapid run-up in prices post-hurricanes Katrina and Rita. So a rise in fuel costs of a specific percentage does not automatically translate into a comparable impact on costs of production. Furthermore, the latter months of 2005 have witnessed a steady decline in retail pump prices from near \$3.00 a gallon to about \$2.00 a gallon – well below the spring 2005 prices.

The rising price of natural gas is particularly significant as it is an ingredient in the production of nitrogen fertilizer. However, the effects of higher energy costs on fertilizer prices occur with a lag of some months due to the lengthy manufacturing process. Some petroleum products are used in the manufacture of pesticides which are mostly applied in the spring and early stages of the farm production cycle, as are the fertilizers. Therefore, the greatest impact on the "bottom line" in farming will be the spring 2006 purchases of manufactured inputs.

Behavioral Response

Purchases of farm inputs are concentrated by farm typology. The ten-percent of all farms that are classified as commercial farms account for 70-percent of production expenses while contributing 85-percent of the sales. Even so, gasoline, diesel, propane, natural gas, and other off-road fuels and oil purchases are among the most widely used inputs, regardless of primary focus as either a crop- or livestock-production oriented farm. As a result, nearly all farmers stand to be affected by price changes for fuels and energy. Two purchasing practices are used most by farm operators to lessen the cost of inputs: lock in input prices through forward purchasing, and negotiating price reductions for many of their purchased inputs by buying large quantities. Again, these managerial practices are typically conducted by commercial farmers whose operations are sufficiently large so that they can employ other management practices that can help reduce the prices they pay for inputs and help mitigate market uncertainties for manufactured inputs.

Cognitive Response

As to the outlook for the fuels and energy outlook for 2006, the *guess-timate* can best be couched in the overall total production expenditures situation. Total production expenses for 2005 are projected to be up six-percent from 2004. Most of the increase is due to price increases in three expenses: fuel and oil costs; fertilizer costs; and livestock and poultry purchases. Fuel and oil expenditures at retail are now expected to have increased nearly 40-percent over year prior totals, while fertilizer expenses are

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ENERGY ISSUES, POLICY OPTIONS

BY MICHAEL WETZSTEIN AND BARRY BARNETT

As in other states, Georgian consumers, business leaders, and government policy makers are struggling with high gasoline prices and the coming steep climb in winter heating energy costs. With world oil reserves projected to peak within decades and the ever increasing global demand for energy, it is important to transform this struggle into a smooth conversion from nonrenewable fossil-based energy toward renewable energy. There are a number of policies and programs that Georgia policy makers could consider which support such a smooth energy transformation for its citizens and businesses.

In terms of transportation initiatives, Georgia will allow hybrid electric vehicles to drive in high occupancy vehicle lanes regardless of the number of passengers if approved by the U.S. Congress or Department of Transportation. Many states already have established this initiative, without federal approval, along with a number of other policies for encouraging alternative fueled vehicles. These other possible policies include exemptions from state taxes and emissions testing and inspections for hybrid or alternative fueled vehicles and equipment. This could be in the form of reduced registration fees and state sales taxes, and/or an income tax credit for the incremental cost of purchasing a hybrid or alternative fueled vehicle. Such tax credit could also be extended to businesses involved in the design, development, and manufacture of alternative vehicles. The state could also take the lead in establishing fuel economy standards for its vehicle fleets and require a percentage of these fleets to use hybrids or alternative fuels. As a cushion for state-agency higher costs, the state could provide rebates on the purchase of these energy-efficient vehicles. A major policy would be mandating the replacement of the environmentally degrading MTBE fuel additive with renewable biofriendly ethanol fuel. Numerous states have already banned MTBE or are in the process of doing so. Alternatively, a modest policy would be to just encourage employers to distribute bus passes or transit voucher benefits to their employees.

Energy policy is not just restricted to transportation. We are all major users of energy within our homes. Household energy efficiency could be promoted by favorable income tax treatment on the sale of energy-efficient homes. This could be in conjunction with policies establishing energy-efficiency standards for appliances. On the supply side of residential and commercial energy use, the state could consider policies which require utility companies to generate a percentage of their electricity from renewable resources. Such policies could be coupled with an energy-efficiency fund to soften the economic hardship on low-income families facing higher energy costs. This energy-efficiency fund could also be used to fund low-interest loans for local governments, schools, and small businesses that make investments to improve energy efficiency. State assistance to these institutions and businesses in development and implementation of energy management programs would reduce the information costs of becoming energy-efficient.

If, as projected, energy costs continue to climb steadily over the long-run, it will be important that new buildings and homes meet energy-efficiency standards. This may require the state to consider adopting energy efficiency standards for state buildings that exceed current federal standards. Consideration may be given to policies that require architects of new state buildings to certify that the construction or renovation complies with the alternative energy and energy-efficiency architectural design requirements.

These, and other innovative energy programs, could be the basis for an overall state energy policy. Such a policy could aid in facilitating a smooth transition into future renewable energy sources. Information on energy efficiency laws and regulations adopted in other states can be found at http://www.greenbiz.com/news/news_third.cfm?NewsID=28891. ©

Energy and Fuel Prices Outlook (Continued from Page 3)

forecast to have risen nearly 20-percent. Pesticides and electricity, the other two major expendable manufactured inputs, are expected to increase in the range of the annual inflation rate (3.5 – 4.0-percent). Purchase prices for the fixed assets of farm equipment and buildings and improvements are expected to reveal a similar year-end pattern.

Forecasting agricultural inputs' prices is reminiscent of a quotation attributed to John Kenneth Galbraith, "Those who forecast the future do so not because they know, but because they were asked." What a difference time makes. In mid-November – two months after Hurricane Katrina had its impact on fuel supplies traversing the Plantation Pipeline and even less time since Hurricane Rita slowed fuel logistics with the Colonial Pipeline through Georgia – offered retail gasoline prices at the pump were below year-prior prices. So what does the future foretell? Astute management decisions must be made in acquiring manufactured inputs when the price available is acceptable to the operations, anticipated needs, and cash flow of the farm. Hesitating or waiting for a better or lower price may not be an economically prudent option. Prices of the manufactured inputs will rise in 2006, at an overall rate of about 12-percent, nearly double the increase observed in 2005. Leading the increases will be the fuels and energy, as well as the related manufactured inputs that are petroleum-based, namely the fertilizers and pesticides. ©

PRODUCING ENERGY FROM GEORGIA'S AGRICULTURAL PRODUCTS AND BY-PRODUCTS – FUTURE OR FOLLY?

BY GEORGE SHUMAKER AND JOHN MCKISSICK

Over the last couple of years, the Center for Agribusiness and Economic Development (CAED) has been requested to investigate the feasibility of producing energy from various types of Georgia produced agricultural products and by-products (feasibility studies available at www.caed.uga.edu under *Publications*). Many people are interested in producing cheaper sources of alternative energy given the escalating prices. Others are interested in perceived environmental impacts of producing energy from agricultural and forestry renewable sources. Still others are interested in the economic development impacts, particularly in rural Georgia, from development of a bio-based energy industry in Georgia. The success of various groups producing ethanol from corn and biodiesel from soybean oil in the Midwest has attracted interest in duplicating their efforts here in Georgia. Other efforts focus on using various underutilized agricultural products such as pine harvest trash, cotton stalks, peanut hulls, wheat straw and other such materials as well as potential new products such as switch grass as feedstock for energy mills. Still others see alternative uses for products with existing markets such as using spent cooking oil or chicken fat as feedstocks.

Each of these potential energy sources and the technologies used to convert them into energy has some potential for Georgia, but each has several draw backs for profitable energy production even under the current relatively high energy cost structure. The ability to convert these products into energy is proven. However, the relevant question is whether or not they are economically feasible to do so in Georgia.

The investigations undertaken by the CAED have provided some useful insights into the benefits and pitfalls of producing energy from agricultural products. We learned about the current methods used to make energy from agricultural products and learned about the market characteristics that have made some of the ventures successful. We compared those situations with our conditions here in Georgia and found both competitive advantages and disadvantages for potential producers. We also learned that both acquiring feedstock at “low” prices is required for success and that marketing all the output – both the “energy” product and the “non-energy by-products” at “high” prices – is a challenge. We also learned that markets are altered by the establishment of a new enterprise and the changes to the price structure of both inputs and outputs may be difficult to accurately predict. Finally, we have shown that the potential economic impact and return to the state is mostly dependent on using Georgia grown feedstocks to produce the energy no matter the form or type.

Biodiesel Production in Georgia

Producing biodiesel from soybean oil has grown in the U.S., especially in the upper Midwest. USDA estimates that about 75 million gallons of biodiesel will be produced in 2005 with rapidly increasing production capacity coming on line over the next two years. About 60 million bushels of soybeans were used to produce the soybean oil used to produce the biodiesel or about 2 percent of the 2005 U.S. soybean crop. Georgia's 2005 soybean production is expected to be about 4.4 million bushels compared to a US crop of more than 3 billion bushels. Other vegetable oils and animal fats can also be used to produce biodiesel. An entrepreneur in Rome, GA is using chicken processing by-products as a feedstock in producing biodiesel.

The technology for converting vegetable and animal fats into biodiesel is straightforward. The methyl ester process of combining the feedstock with methanol and a catalyst is well accepted and understood. One-hundred pounds of animal fat or vegetable oil will produce about 98 to 99 pounds of biodiesel. The key is having a good plant design and competent management and labor to produce a product that meets mandated quality standards. The 15 million gallon per year plant we evaluated would cost about \$10 million to construct and would produce biodiesel for about \$2.37 per gallon with feedstock costs of about 25 cents per pound (current soybean oil prices).

Feedstock costs represent about 70 to 80 percent of the operating costs of producing biodiesel. It is imperative that the feedstock costs be kept to a minimum. Georgia has large supplies of animal fat by-products which are usually valued at considerably less than vegetable oils. Also relatively large supplies of used cooking oils are available in metropolitan areas. While both of these potential feedstocks are produced in large quantity in Georgia, the availability of each to a commercial biodiesel producer is questionable.

The successful biodiesel producers in the Midwest are located near major soybean crush operations, thus minimizing the cost of the feedstock. Comparatively, Georgia has only one major soybean crusher located in the southern part of the state. That facility needs to acquire a significant portion of its soybeans from outside Georgia, thus raising its costs. The soybean oil it produces currently has a market and the entry of a potential new purchaser, i.e. a biodiesel plant, would add upward price pressure on an already expensive product. This added cost of the biodiesel feedstock – essentially the cost of transporting the needed soybeans – is a major burden. The major potential source of vegetable oils produced in Georgia would be peanuts. However, peanut oil is considered premium oil compared to other vegetable oils, thus usually selling at more than twice the price of soyoil.

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Producing Energy from Georgia's Agricultural Products and By-Products

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Ethanol Production in Georgia

Ethanol production has expanded very rapidly over the last 6 years in the U.S. One way to view this growth is to look at the amount of corn used to produce ethanol. In 1999 about 600 million bushels of corn were used to produce ethanol and USDA estimates that nearly 1.6 billion bushels of the 11 billion bushel crop will be converted during 2005 with continued rapid expansion projected for the next three years. By comparison, Georgia is expected to produce about 29.2 million bushels of corn this year.

The technology for converting corn into ethanol is proven and well understood. The modern plant essentially ferments the whole corn kernel, distills off the ethanol and denatures it by mixing in gasoline. A major by-product is called distillers grains, which are most commonly used as medium quality protein cattle feed. In order to move the by-product any distance, it must be dried. Thus, the availability of large numbers of cattle to consume the wet product in close proximity to the production is a key element in an ethanol plant's profitability. One bushel of corn can produce about 2.5 to 2.8 gallons of ethanol and 10 to 19 lbs. of distillers dried grain depending on the process used. The corn used to run the plant in a typical year represents about 50 to 60 percent of the total cost of production.

We studied two different plant types based on a 30 million gallon per year output capacity requiring about 12 million bushels of corn. The first plant type was the conventional style plant converting whole kernel corn. It has a capital cost of about \$53 million. Given corn costs of \$2.65 per bushel, ethanol price of \$1.85 and dried distillers grains at \$101 per ton (*with all prices current during late 2005*), the plant would generate a net income of about \$17.8 million per year and a 68 percent return on investment. If we use the past five year average prices for corn (\$2.88) and ethanol (\$1.35) the net income drops to a negative \$495,000. Ethanol prices have varied from as low as \$0.94 in February, 2002 to a high of \$2.74 in September, 2005.

The second plant type we studied may be more suited to the Georgia situation since it uses a new technology that ends up producing a higher quality co-product, hi-protein dried distillers grains (DDGS) better suited to the market conditions in Georgia than the lower quality DDGS from the conventional plant type. The main feature of this advanced plant is the fractionation of the corn kernel prior to processing. The kernel is separated into three components – the germ, the bran and the endosperm. The germ contains most of the oil and can be sold as a by-product. The bran can be used as a source of fuel to fire the burner used to produce energy for the process. As a result of the fractionation, a small volume of feedstock is then processed resulting in improved throughput and greater output for a given design size.

Total capital cost of a fractionation plant is about \$70 million. This type unit would produce 31.5 million gallons per year. Given corn costs of \$2.88 and \$142.50 per ton DDGS, the plant would produce a net profit of about \$3.7 million for a return on investment of about 10 percent. Under the market conditions of late 2005 where ethanol was priced at \$1.85, corn at \$2.65 and DDGS at \$142.50 per ton, the plant would yield a net profit of about \$22.3 million for a return on investment of 64 percent.

Energy from Biomass Products

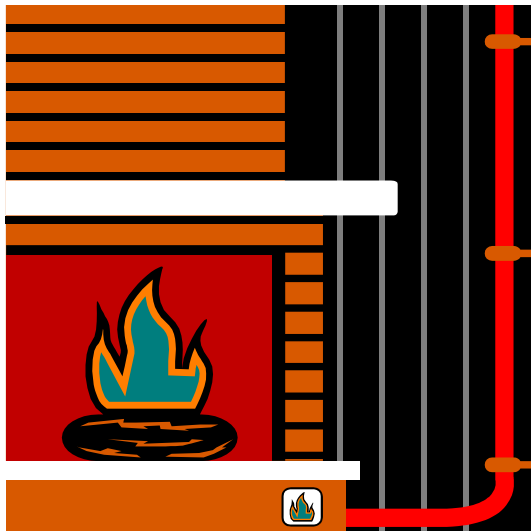
Agricultural activity in Georgia generates a significant amount of biomass that has the potential to be converted into energy. At least 17 million tons of biomass are produced each year in Georgia ranging from pecan hulls, poultry litter, gin trash, pine tree harvest trash, hay, cotton stalks and grain straw among others. Some of these products have current markets; some do not. Most of these products are bulky, widely produced across the state and many of them are only available on a seasonal basis. The delivered cost of these products range from about \$0.80 per mmbTU for pecan hulls to over \$10 per mmbTU for grain straw.

Energy can be extracted from biomass by direct firing of the feedstock, co-firing with another feedstock such as coal, gasification to produce a low calorific gas or pyrolysis (*the conversion into a liquid oil with about ½ the heat content of conventional fuel oil*). The later technology is still evolving into the commercial application stage.

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Producing Energy from Georgia's Agricultural Products and By-Products

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The operating costs of delivering electrical energy from biomass depends upon the type of technology used and the cost of the feedstock. We evaluated the above four technologies at each of three different plant sizes using low, medium and high cost biomass feedstocks. Depending on type of feedstock used, the biomass represented from 35 to 65 percent of the total cost of operation.

Results indicate that electrical energy can be produced by direct firing at about 9.5 cents per kWh with low cost biomass. Co-firing could produce energy at about 8.3 cents per kWh with low cost biomass. Gasification may produce energy at near 5.3 cents per kWh while pyrolysis may produce energy at near 6.6 cents per kWh. For comparison, the average Georgia industrial electrical rates in 1999 were about 4.2 cents per kWh. There clearly remain challenges to be overcome before we will see widespread use of biomass for electrical energy production in Georgia. However, the analysis conducted considered only electric production from the biomass through commercially available technologies.

Making Georgia Competitive in Bio- Energy Production – State Supply

Policy Alternatives

The economic analyses considered to date and based on currently available technology indicate that Georgia may have some advantages in bio-energy production but that significant supplies are not likely to be produced unless the state is willing to consider policies that improve Georgia's comparative advantage. More than 23 states across the US have policies to enhance the production of bio energy within the state. State policies to enhance demand for bio energy are discussed elsewhere in this newsletter and are usually motivated by environmental concerns. Supply policies are driven by the state's desire to enhance economic development and energy security.

State supply enhancing policies currently in use range from direct producer payments, special tax incentives, and grant and loan programs for state based bio-refineries. Most of such incentives are tied to the use of feedstocks produced in the state for two reasons: First, most of the economic impact from such bio energy plants comes from the production of the feedstock. If the feedstock used to produce the bio energy is shipped in from outside the state, the exporting state receives the added employment and income benefits of the feedstock production. For instance, one of the advanced ethanol plants discussed is estimated to increase employment in the state by a total of 1,770 people, economic activity by \$133 million, and state tax receipts by \$4 million annually. However, 1,650 of the jobs, \$62 million of the economic impact and \$3.2 million of the increased state tax receipts are from the production of the feedstock. So, if a state is to invest resources into incentives for bio-energy development, the greatest economic development returns occur from insuring that the underlying feedstock is produced in the state. Otherwise, a significant portion of the subsidy accrues to other states or countries outside the US.

A second rationale for pegging any incentives to home-raised feedstocks is tied to the state's energy security. Development of a bio refinery dependent on feedstocks produced elsewhere is similar to US gas production from offshore petroleum supplies or electric production from coal mined in coal areas. Disruptions in the supplies used to refine the product into energy also disrupts the energy supply. Thus, if biofuel production is dependent on Midwest grain or South American soybeans, the energy producer will be dependent on circumstances impacting the production, transportation and ultimate price of the products in those areas. ©



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Edited by: Cesar L. Escalante, Extension Agricultural Economist

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Issued in furtherance of Cooperative Extension, Acts of May 8 and June 30, 1914, the University of Georgia College of Agricultural and Environmental Sciences and Fort Valley State University, and the U.S. Department of Agriculture Cooperating.

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