Recent increases in fuel prices have generated another cost concern for farmers. Fuel is one of several input costs that have continued to increase over the years with fuel prices taking a dramatic price jump over a short time period. While input costs continue to rise, commodity prices tend to be stable, prompting farmers to reduce costs, if possible, to maintain profit margins. Therefore, fuel usage is one area that farmers can focus on to preserve their economic return.

Farmers can consider several management strategies or ideas for conserving fuel on the farm. The suggestions presented could lead to a reduction in fuel use, and, more importantly, an increase in on-farm savings. The management strategies are presented in three sections. The first section provides suggestions for all equipment and vehicles. The second focuses on tractors and other large equipment. The third section provides suggestions for other on-farm vehicles, primarily light- and heavy-duty trucks.

All Equipment and Vehicles

- **Minimize idling times.** For modern, electronically controlled diesel engines, 10 minutes is usually sufficient to warm up and cool down tractors and other equipment. Excessive idling during break periods can lead to unnecessary fuel use.
- **Reduce excess weight on equipment.** Keep trucks and other hauling equipment cleaned out. Lighter loads require less energy to move.
- **Inflate tires to appropriate pressure.** Keep tires properly inflated. Inflation pressure is an important variable for traction efficiency, tire life, and ride comfort—especially for radial tires. Check your owner’s manual or the tire distributor for suggestions on inflation pressure. Improperly inflated tires can reduce gas mileage and tire life expectancy.
- **Perform routine maintenance.** Routinely replace fuel, oil, and air filters and use the proper grade of motor oil in all vehicles, tractors, and other equipment to keep them operating at peak efficiency. Consult your owner’s manual for the proper timing and list of maintenance operations.
- **Communicate using cellular phones and radios rather than driving to talk with someone.**

Tractors and Large Equipment

- **Perform multiple field operations within the same pass.** Consider modifying equipment so that you can perform multiple operations in one pass. Examples include strip tilling and planting in the same pass using one tractor. Some manufacturers sell tractors with hitches located on the front and back, providing implement attachment points at both ends of the tractor.
- **Avoid compacting soil by staying out of wet fields.** Extra tillage and extra power (and therefore more fuel) are needed to break up compacted soil.
- **Practice conservation tillage to improve soil structure, reduce soil erosion, and increase organic matter content while conserving fuel.** Tillage uses more fuel per acre than most other field operations, especially subsoiling. Under conservation tillage or no-till management, farmers minimize the tillage performed and the number of trips across a field. Evaluate your total cropping system to determine the appropriate level and frequency of tillage.
• **Attempt to match the tractor horsepower to the equipment or loads.** Properly matching machinery can minimize excessive power usage, which results in unnecessary fuel consumption. For example, avoid pulling a light load with a high-horsepower tractor.

• **Gear up and throttle down when using a high-horsepower tractor to pull light loads.** Run an under-loaded tractor in a higher gear at a lower engine speed to save fuel. However, be careful to not overload the engine. If the engine RPM does not change quickly when throttling down, you should probably shift down a gear.

• **Maximize tractive efficiency by properly ballasting tractors for the operation at hand.** Tractive efficiency is a measure of the effectiveness of the tractor to transfer available power to the ground and is directly affected by weight distribution and tire slip. Maximum tractive efficiency is typically attained with drive tire slip between 8 and 15 percent. Add the appropriate amount of weight to properly distribute the draft load uniformly to all drive tires, which helps control slip. Many tractor manufacturers are providing performance monitors that provide real-time slip estimations. These can be used to visually assess slip during operations. High slip levels cause excessive tire wear and poor fuel efficiency, which indicates an under-ballast condition requiring additional ballast or the use of a larger tractor. Conversely, low slip levels indicate that the tractor is carrying too much ballast causing higher fuel usage while placing extra load on the axles and drive train. Ideally, weights should be added or removed to match the load when tractors are used for different field operations and conditions.

• **Lay out fields to minimize turning time at headlands and point rows, if you can do so without causing excessive soil erosion.** Using a global positioning system (GPS) to map field boundaries can help optimize field layout for various operations and can help minimize in-field time. Attempt to maximize row length and minimize the number of turns.

• **Minimize the amount of time spent driving tractors and other field equipment on the road.** Keep tractors and other equipment in the field as much as possible. Use faster and more fuel-efficient vehicles to service equipment in the field and to haul harvested crops to storage.

• **Consider using differential global positioning system (DGPS) based guidance systems.** These systems, whether a simple light bar or an autoguidance system, can help reduce overlap during field operations. The use of guidance systems, instead of foam markers or dead reckoning, has been shown to increase field efficiency, reducing fuel consumption. These guidance systems also permit working at night and can reduce operator fatigue.

**Figure 2. Example performance monitor from a John Deere tractor with the ability to display wheel slip**

**Figure 3. Illustration of guidance system used within a conservation tillage (no-till with cover-crop) management scheme**

• **Consider using variable-rate application (VRA) strategies, primarily for fertilizer, lime, herbicide, and insecticides.** This type of site-specific management approach indicates which areas of a field do not require particular inputs and, therefore, do not require coverage during application.
Other Farm Vehicles

- Use all-terrain vehicles (ATVs) or motorcycles to run errands and perform light tasks around the farm. They are more fuel-efficient than heavy-duty pickups.
- Use more fuel-efficient vehicles for making trips to fields or to town when you are not hauling heavy loads. Although heavy-duty pickups and other trucks play an important role on farms, they are often used for trips that do not require their power and hauling capacity.
- Run a heavy-duty diesel truck at an RPM 40 percent below the peak torque. Diesel-powered truck research has indicated that this is the point at which maximum fuel economy is achieved.
- Consider diesel engines instead of gasoline engines when planning to purchase a new heavy-duty truck. Diesel engines produce more torque at the same engine speed as gas and can be more efficient when hauling heavy loads. For general usage, however, consider what the truck will be doing most of the time and remember that fuel is only one component of ownership cost.

- Combine errands into one trip rather than making multiple trips.
- Accelerate gradually and drive smoothly rather than driving aggressively. The Environmental Protection Agency has reported a 20 percent advantage in fuel economy for drivers displaying these driving characteristics.
- Make trips during less congested times during the day to avoid heavy traffic periods and delays.
John Fulton, Assistant Professor, Biosystems Engineering, Auburn University, Randy Raper, USDA-ARS, National Soil Dynamics Laboratory, Auburn, Timothy McDonald, Associate Professor, and Ted Tyson, Extension Specialist and Professor, both in Biosystems Engineering, Auburn University.

For more information, call your county Extension office. Look in your telephone directory under your county’s name to find the number.

Issued in furtherance of Cooperative Extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, and other related acts, in cooperation with the U.S. Department of Agriculture. The Alabama Cooperative Extension System (Alabama A&M University and Auburn University) offers educational programs, materials, and equal opportunity employment to all people without regard to race, color, national origin, religion, sex, age, veteran status, or disability.

© 2006 by the Alabama Cooperative Extension System. All rights reserved.