Energy prices have come down considerably in recent weeks, but they are still at historic highs. And while the Midwest is focusing on turning corn into fuel, the rest of the world is responding in similar fashion, even in Colombia, a country better known for coffee and coca, but a significant producer of sugar cane. Like the U.S., Colombia’s president has pushed for ethanol expansion, with five new sugar cane-based ethanol plants being built there in recent years. With those plants running, Colombia's total fuel ethanol production capacity will be approximately 100 million gallons per year. This is a fraction of U.S. or Brazilian production, but Colombian farmers producing the sugar cane are gearing up for the increased demand, just as U.S. farmers are with corn.

“We look as hard as any farmer to employ technologies and resources to help us increase returns or reduce costs in our crop,” said Jorge Villegas, who along with his brothers own Oriente El Norte Del Agro, a 3000 acre commercial farming enterprise near Palmira, Colombia. Farmers manage a complex set of resources to produce their products, and Colombian sugar cane producers such as Villegas are working to reduce soil compaction, conserve irrigation water, minimize weed control costs, and make the most of their fertilizer purchases, among others.

Ideal Growing Environment. Most of Colombia’s sugar cane is grown in the Cauca Valley, a rich, mostly flat agricultural valley with annual rainfall similar to the eastern Corn Belt, but summer-like temperatures year-round. There are about a half million acres of sugar cane in the valley, planting and harvesting occurs year around, and yields exceeding 50 tons/A are common, some of the highest yields in the world. As a result land in the valley is not cheap—currently selling for $4,000/A or more, doubling in price just in the last few years. The Colombian government is becoming increasingly strict about environmental issues, putting additional pressure on farmers.

Applying Technology to Sugar Cane Production. Sugar cane is a perennial crop, and in Colombia it is harvested every 13 or 14 months. For many in Colombia this is their only crop, grown year after year. Plantings can last for several harvestings (ratoon), but it is common for production to begin to decline after a few years, often due to gradual declines in stands, so fields are then torn up and planted anew. There is great interest in using precision technologies, but the production system doesn’t lend itself to using some of the tools that are common to U.S. farmers. One major hindrance is that there is not currently a
commercial yield monitor available in Colombia—denying producers the opportunity to see any potential payoffs of site-specific management. And much of the harvest is still done by hand, a reasonable approach when field laborers can be hired for about $1/hour.

Soil compaction is an extreme problem in Colombian sugar cane production. Freshly harvested cane cannot be stored for any length of time, and contracts with the mills require delivery when it is needed, so fields are frequently harvested when soils are wet and not otherwise suitable for traffic. Mechanical harvesters there cover one row at a time, and work in tandem with wagons traversing the fields that when full may contain 20 tons of cane. The logical solution in other crops and management systems is controlled trafficking using guidance, but the one-row-at-a-time system in cane is not well adapted to this.

Deep tillage is the Colombian farmer’s remedy to compacted soils, but this creates additional problems as well—by bringing up huge chunks of soil that leave field surfaces irregular. This uneven field surface makes the use of large-scale fertilizer and pesticide application difficult—thus, many crop inputs are applied manually, or with all-terrain vehicles (ATV’s).

While U.S. farmers are adopting guidance systems, the use of guidance systems to reduce skips and overlaps in field operations has not found widespread use in sugar cane. As a perennial crop many of the field operations follow established rows. A possible use of guidance is for harvesting to stay on rows to reduce damage to the crowns. It is often difficult for the harvester operators to stay on the rows, or sometimes to even see the rows—and harvest often occurs through the night as well, with many operations employing three crews that rotate to operate day and night.

Three forms of herbicide weed management being used on the same large commercial Colombian farm. From left, whole fields are treated with workers utilizing backpack sprayers; ATVs are used in lieu of larger equipment due to ground unevenness from tilling compacted soil; Tractor-mounted weed sensor technology being used under a hooded sprayer to increase the efficiency of between-row weed control.
Working Together. One of the most impressive aspects of sugar cane production in Colombia is in how well the various players in the production system work together, an aspect that might offer insight for U.S. farmers. When farmers sell sugar cane, 0.55% of the value of the crop goes to Cenicaña, an industry funded organization, to fund sugar cane research and outreach programs. Production records for nearly every sugar cane field in the valley are kept by Cenicaña, which can source this information to judge the impact of varieties, planting and harvesting dates and methods, fertilization, and the like. This information is kept in a web-accessible database for query and interpretation by member growers and mills. “There is a relatively free exchange of information back and forth among the mills, growers, and Cenicana. We all reap the benefits when we can work together to solve our production and management issues,” added Villegas.

Diversification. When nearly all farms in the valley are growing only one crop—sugar cane—year after year, and all year around—diversification is a logical question. The Villegas operation has diversified into other areas—the original farm home has been renovated and rents for community and corporate events. They offer custom application of pesticides, and also sell software decision tools for sugar cane producers. They currently raise tropical flowers (see web site) are considering fruit or nut production, but current high sugar prices aren’t encouraging them to look too far otherwise.

In summary, the experience and lessons learned from large commercial farmers growing other crops in other countries give perspective to our situation in the Midwest. Sugar cane growers continue to seek ways to reduce costs, increase productivity and sugar yields. With sugar prices at 20-year highs, high-priced energy, and with sugar cane a relatively efficient source of fuel, the future looks bright for Colombia’s commercial growers.

For more information:
Tecnicaña, the Association of Colombian Sugar Cane Technologists

Cenicaña, The Colombian Sugar Cane Research Organization http://www.cenicana.org/

Oriente El Norte Del Agro, farm web site for Rodrigo Villegas:
http://www.eoriente.com/oriente/home/home.php3

Case Grande El Oriente, the original “farmhouse” of the Villegas family, is the centerpiece of their agri-tourism venture. Diverted mountain streams run through the property to irrigate crops and provide refreshment as they run through and around the home.