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Sugarcane Production and Precision Ag Technology

The world of precision agriculture has made great strides in the past few years. The cost of the technology has dropped dramatically to such an extent that the equipment is affordable enough to implement on commercial farms. But the question always arises if the investment in the equipment is profitable in the short or long term. In some cases, it certainly does. But in others, no costs are directly recovered in increased profit, increased yield, or decreased inputs. In working with different forms of precision agriculture technology over the last decade I have learned one universal law: precision technology can be likened to a firearm – it is only as accurate, beneficial, or detrimental depending on how a person uses it.

Those involved in sugarcane production currently are lacking a basic, but crucial component of precision ag technology – a working and usable yield monitor. Several prototypes have been tested in Louisiana over the past few seasons, but the heavy mass of harvested sugarcane, relatively high amounts of trash, and the durability of the equipment in our harsh harvest environment has posed significant barriers. Yield monitors that have been successfully used in grain crops have the ability to not only measure the yield of the crop per acre, but also the moisture content of the harvested grain. In sugarcane, even if we get a working yield monitor, will likely only be able to measure gross cane yield per acre/hectare, not the sugar content of the stalks or sugar per acre/hectare. Still, if a functional yield map could be generated based on gross cane yield, significant strides could be made in zone management tailored to changing soil type, drainage, fertility, etc. within a field. In addition, those industries with stringent truck weight restrictions placed upon them, an accurate yield monitor would minimize highway regulations and at least in our case in Louisiana, reduce lost income to producers as current state laws do not allow growers to be paid for any cane delivered over the 100,000 pound gross weight limit/truck unit.

Other forms of precision ag technology are quickly taking hold in the Louisiana industry. GPS mapping of fields has been used for some time, and this alone has saved an average of 7% input costs for our producers. Current government acreage measurements do not take into account uncultivated land area in fields (i.e. ditches, headlands, etc.). After 10 years of GPS measurements, we have found that on average the acreage measurements traditionally provided to producers are 7% higher than actual cultivatable land measurements measured with GPS. This has reduced costs on any input or service applied on a per acre basis.

Many producers and agronomists are also using a strategy to manage the dynamics of yield potential within a given field. Soil types, fertility, and drainage often change significantly within a single field. By separating a field by management zones, not by arbitrary field boundaries, one can then treat several different areas of a field separately when conducting soil analysis, or applying fertilizer, ripener, and/or herbicides. Currently, zones can be defined from aerial imagery or from soil conductivity measurements, but having a functional yield map from a harvest monitor would complete the puzzle.

Other, more basic forms of precision ag technology have proven quite practical and useful in our industry. A simple light bar guidance system connected to a GPS unit is becoming more and more common on sprayers used to apply pesticides. As the labor situation is getting more and more problematic, producers have moved to very large, high speed sprayers to cover large acreages more efficiently with less labor. These large sprayers present a problem as the more sugarcane rows covered by a boom swath, the harder it becomes to count rows to make sure no overlaps or skips occur. Much time and efficiency is lost applying pesticides due to sprayer operators having to back track and recount rows to reduce overlap problems. Even when spraying on raised sugarcane beds, many of the guidance systems can "count rows" for an operator and guide them right into the next pass so they can focus more on folding in booms, reducing chances of hitting booms on fence-lines, etc, or even worse, driving the sprayer into a ditch. When spraying on flat ground, minimal overlap of spray coverage allows for reduced input costs as well. This equipment also allows the farm manager to download coverage maps to make sure operators have not skipped or overlapped areas of the field.

Auto-steer equipment is rapidly becoming more and more common. Using a very high precision GPS technology called RTK (Real Time Kinematics), along with an automatically-steered tractor, repeatable accuracy of less than one inch can be achieved. Some producers are using this equipment to mark and draw raised beds not only for perfectly straight rows, but to insure row width is uniform across the field. Uniform row width allows for large capacity sprayers to apply a narrow band of herbicide on top of each row. It also allows a producer to use tillage implements that cover 3, 4, 5, or more rows per pass without damaging cane or causing further cultural problems.

As the technology used in precision agriculture improves and costs come down, we will likely see more farms in our state adopt some or all of the tools available. The equipment is becoming easier to use, more durable, and practical. But the major barrier that still remains for sugarcane producers is still the lack of an effective harvest yield monitor, which hopefully will be available to our industry in the recent future.

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