WHO IS PROJECT LIBERTY?
by: Randall Pelzer, Biomass Coordinator for POET

Last week, I had my first opportunity to tour the inside of Project LIBERTY. We all know what Project LIBERTY is, but as I walked around and saw over 400 people working on the project, I asked myself, “Who is Project LIBERTY?”

The answer wasn’t as simple as I thought. There are many people who have collaborated to make this project happen. Project LIBERTY is the visionaries at POET-DSM who dared to ask, “How can we make a 100 percent renewable fuel out of corn residue?” And they asked, “How could we make it sustainable long-term?” And even bigger, “How can we make it profitable?”

Project LIBERTY is the researchers and engineers who developed the system to convert residue into ethanol and then made it functional at the pilot facility at POET Research Center in Scotland, SD.

Project LIBERTY is the corn growers who were asked to try new harvesting models. It’s the equipment manufacturers that developed the new technology needed to make this process better. It’s the United States Department of Agriculture and Iowa State University for their long term research on nutrient removal, impact on soil health and corn yield effects. It’s the agronomists who provided recommendations to the growers. It’s the landowners who rent their farms and allow biomass harvest.

Project LIBERTY is the companies that designed and provided the equipment for the plant. It’s the multiple construction crews. It’s the bankers who are supporting the project by supplying working capital for baling and hauling equipment. It’s the 46 full-time team members who will run the new plant.

Project LIBERTY is the new business that has been created, and it’s everyone that uses ethanol as fuel. This project is monumental, and it hasn’t been an easy undertaking. It took everyone who is Project LIBERTY to make it happen. The opening of Project LIBERTY will be because of them, and it will because of YOU.
LOCAL FARMERS TEAM WITH TECHNOLOGY TO SECURE OUR GLOBAL ENVIRONMENTAL FUTURE

As farmers across Iowa don their boots, caps and gloves to start planting their 2014 corn crop, workers at POET-DSM Advanced Biofuels’ Project LIBERTY cellulose ethanol biorefinery are hustling to put the finishing touches on a history-making facility that will bring together 21st century technology and agriculture to benefit mankind.

While farmers represent a sustainable, biologically friendly profession that has fed us for millennia, LIBERTY’s technology, which will utilize local farmers’ corncrop residue from the coming harvest, represents a hope for our global environment promising cleaner air, more abundant local jobs and a more secure energy future for all. Together, these three forces are the backbone for a global, bio-based economy. They form a partnership that uses nature’s raw materials to produce fuel and materials in just a few days that we need in the present – not millions of years from now.

As we ready LIBERTY over the next several weeks to produce cellulosic ethanol in Emmetsburg, we’re looking forward with anticipation to taking this advanced, bio-based technology to other parts of the country and regions of the world. We long to share its advantages with others who struggle daily to breathe, travel, work and provide comfortably for their families. Soon, the people of not only the United States, but possibly areas like Brazil and China and many other diverse places will be sustainably using LIBERTY technology to enhance their lives and secure their futures.

We thank you in the Emmetsburg community for all of your faith, your hard work and your commitment to bettering not only this small corner of Iowa, but also ultimately many untold places around the world – and their people – who will reap the benefits of our combined efforts.

Tillage and Nitrogen Application Effect on Corn Residue

Crop residue serves an important role in physically protecting soil by preventing soil erosion during rain events or high winds. Residue also plays a significant role in enhancing the soil biological community by providing sources of organic carbon and nitrogen for its energy or food needs.

In order to understand how residue breaks down, you need to understand how the biological and chemical activities decompose residue and how these are influenced by environmental and soil conditions. This includes air and soil temperatures, soil moisture, soil pH, oxygen, and types of microbial community. In agriculture, annual cropping systems and other ecosystems managements can influence these factors.

There is a common belief among many farmers and agronomists, that the physical change in crop residue structure or orientation in the field by tillage can accelerate residue breakdown by the cutting of crop residue into small pieces or burying residue by tillage. Also, there is the belief that the application of nitrogen fertilizer on corn residue after harvest can speed up the residue breakdown. Both assertions are not correct.

Tillage effects

Recently, we conducted a study to examine the effect of three different tillage systems, including deep tillage, strip tillage, and no-till on residue breakdown of both Bt (Bacillus thuringiensis) and non-Bt corn residues. The results of this three-year field and laboratory study show no significant differences in the breakdown or percent of remaining residue among the three tillage systems of Bt and non-Bt residues breakdown. Also, after 12 months in these studies, there was no difference between tillage systems of Bt and non-Bt residues breakdown. The results showed that corn residue breakdown increased with time with smaller amounts of residue remaining after each evaluation period. There were no differences in the rate of residue breakdown as a result of different nitrogen rates application. The timing of nitrogen application for corn residue decomposition after harvest, as practiced, is not an effective strategy, as the soil and air temperatures decrease over time after fall harvest.

The same results were observed with laboratory evaluation. Corn residue samples from the field were incubated in the laboratory under constant temperatures of 32° F and 90° F for approximately 30 days each. The laboratory results confirmed the field results and demonstrated temperature effects in controlling residue breakdown rather than nitrogen rate in which a slower rate of residue decomposition was observed at the low temperature and increased at the higher temperature without any nitrogen effect.

The use of tillage or nitrogen application to increase residue decomposition can be counterproductive from economic and environmental perspectives by affecting soil health and water quality.

Nitrogen fertilizer application effects

Corn residue breakdown was evaluated by applying three nitrogen rates, 0, 30 and 60 pounds of nitrogen per acre of urea ammonium nitrate (UAN) (32%), to corn residue immediately after harvest. Specific amounts of corn residue were weighed and placed in nylon mesh bags and left in the field after harvest for residue breakdown evaluation. The rate of residue decomposition was evaluated every three months for the entire year.

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LIBERTY PROFILE

Name: Bill Huberty
Title: Plant Merchandiser

What is your role in LIBERTY?
My role with Project LIBERTY is to communicate with area farmers about contracting EZ Bales™ for LIBERTY. I visit with them to help them make decisions that will positively impact their future. I also try to be the best team player that I can be.

What do you enjoy most about your job?
I think the teamwork is second to none. Everyone is so helpful. It is nice to communicate with the farmers and learn new things every day.

When not working on LIBERTY activities, what do you like to do?
I like to spend time with my wife and son. He is involved in all kinds of activities. I like to golf and BBQ. I have about seven grills and smokers. Picnic anyone?

If you have an evening that you can go out and grab supper with someone, where do you go and what do you order?
I would go to Zombie Burger in Des Moines and order a burger and fries.

RESIDUE MANAGEMENT, NOW AND IN THE FUTURE
submitted by: Ken Wagenbach, AGCO
As any producer of corn knows, yields are continually increasing. Just as we increased from yields in 1960 of roughly 50 bushels per acre to 150 in 2010; we are being told to expect yields to double to 300 bushels per acre by 2030. As with all good news, this presents us with something we will have to deal with; namely too much residue.

The relationship of corn yields to stover produced is directly proportional. 150 bushel corn produces 4-plus tons of corn grain per acre; it also produces 4-plus tons of stover. As mentioned in the winter 2013 newsletter, you get major nitrogen fixing, the soil warms slower, mold and disease can be hard to manage, as well as lots of tilling required; and here we are with ever-increasing yields. Our seed companies like Pioneer and Monsanto are producing new strains and hybrids resistant to diseases and pests that take longer and longer to break down. So instead of moving to less tillage we are required to do more. And as yields go higher, more stover is produced. In fact, when we do get to a 300-bushel yield, our fields will be producing 9-10 tons per acre of stover. As you can imagine, a residue management plan is required long before we get there.

However, there is a silver lining, in corn-on-corn rotations residue management has many healthy aspects for the land. There is less nitrogen fixing, in fact you might not need any nitrogen applications to maintain soil and crop health. The soil warms faster; you get better seed spacing, placement and soil contact, better early growth, and less tillage required. Last but not least, increased yields of 7+% are very likely to be seen with a proper residue plan. This has been confirmed in independent studies of both Monsanto and Pioneer.

Another bit of good news is that the POET-DSM project is nearing completion, which will be the ideal place to take your residue, therefore adding to the potential value created by an increased yield. So far there seems to be little if any downside to a residue management program.

AGCO has been working for several years on equipment that is well suited to the task of helping you manage your residue. Our large square and round balers are central to the job and we are putting the finishing touches on some others as well, such as our single pass combine/baler system and variable take rate chopping corn head. All of these tools are designed to help you with the goal of developing the best residue management plan possible for your farm. See you in the fall.
Join us for the
LIBERTY EQUIPMENT SHOWCASE.
July 15
Wild Rose Casino in Emmetsburg, Iowa

Equipment manufacturers will be on-site to talk to you on how they can help you with your biomass collection or other farming needs. More details coming soon!