

2008 ANNUAL RESEARCH REPORT

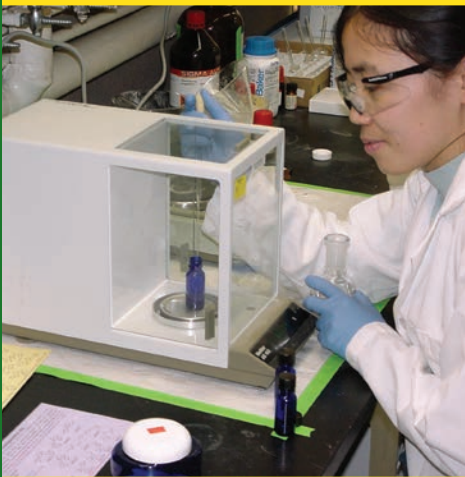


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December 2008

Dear Michigan Corn Farmers:

In 1992, the Corn Marketing Program of Michigan (CMPM) was established by corn farmers in Michigan in order to enhance the economic viability of corn production in our state. Every five years, the check-off program goes back to a vote of the state's corn farmers. Since the program's establishment, the farmers have overwhelmingly supported the check-off program in each continuation vote.

Through the CMPM, corn farmers in Michigan have invested in check-off funded research projects that focus on improving on-farm production and conservation practices, strengthening traditional markets, and also developing new uses for corn. The CMPM strives to expand and enhance current markets while at the same time develop new markets for our state's corn.

The CMPM has funded more than 150 research projects that have led to an expanding corn heat industry, and the development of corn-based products for new markets such as carpeting, fabrics, packaging materials, salt substitutes, pharmaceuticals, and plastics that replace petroleum-based products.

It is exciting to be part of such a forward looking group. Research we funded through the CMPM five to ten years ago is being commercialized and can be found in the marketplace. Our funds have led to the development of a sodium-free salt substitute, pharmaceutical compounds, and plastics. The CMPM is dedicated to investing funds contributed by the state's corn farmers into not only improving production practices, but also towards developing new markets for Michigan's corn crop.

The following pages in our Annual Research Report showcase how the CMPM has invested check-off funds. The research projects discussed were completed in 2007. All of the research is designed to help keep the Michigan corn industry on the cutting edge of production, technology, and new uses. If you have any questions or suggestions about the research funded through the farmer check-off funds, contact the CMPM office at 1-888-323-6601.



Sincerely,



Clark Gerstacker, President
Corn Marketing Program of Michigan

Corn Marketing Program of Michigan

Established under 1965 P.A. 232, and voted in by the state's corn farmers in 1992, the Corn Marketing Program of Michigan (CMPM) receives one penny per bushel for all Michigan corn sold. The "check-off" funding is invested in research, education, market development, and new uses. The continuation of the program is voted on by Michigan farmers every five years. For the program to continue, the referendum vote must be approved by both the majority of voting farmers and corn production. The nine-member Board of Directors, appointed by the Governor, sets the yearly direction of the program. As a way to dispense research results to the state's corn farmers, the CMPM annually holds the Corn & Soybean Winter Research Meetings and publishes an Annual Research Report, highlighting current and past check-off funded research projects.

Leveraging State Resources to Conduct National Research

The CMPM, works cooperatively on research projects with 27 other corn-growing states across the nation through its affiliation with the National Corn Growers Association (NCGA). In 2008, the CMPM worked cooperatively with the NCGA on two main research projects, each looking to increase demand and add value to the U.S. corn crop. These projects focus on converting ethanol into chemicals and mapping the corn genome.

Biodiesel Formation Utilizing Reactive Distillation

The CMPM, in conjunction with the NCGA, has been working with Dr. Dennis Miller at Michigan State University to study a separation process known as reactive distillation.

Reactive distillation is a technique in which a mixed chemical stream is treated with a reactive chemical in the presence of a catalyst. This results in a combination of chemicals that can easily be separated, saving both energy and plant design costs. It is anticipated that this technology will allow the application of traditional catalysts to non-traditional corn-derived feed streams.

As the market for biofuels continues to aggressively expand, ethanol and biodiesel co-products will be in excess supply. A major co-product of biodiesel production is glycerol. Through further processing of glycerol, a diesel fuel additive can be created.

"This technology is applicable to dry grind ethanol facilities as fractionization and oil separation for additional fuel production becomes more popular," said Clark Gerstacker, a NCGA Corn Board member and a corn grower from Midland. "This technology allows us to further

expand fuel production capacity for a biofuel plant with a relatively simple platform."

Mapping the Corn Genome

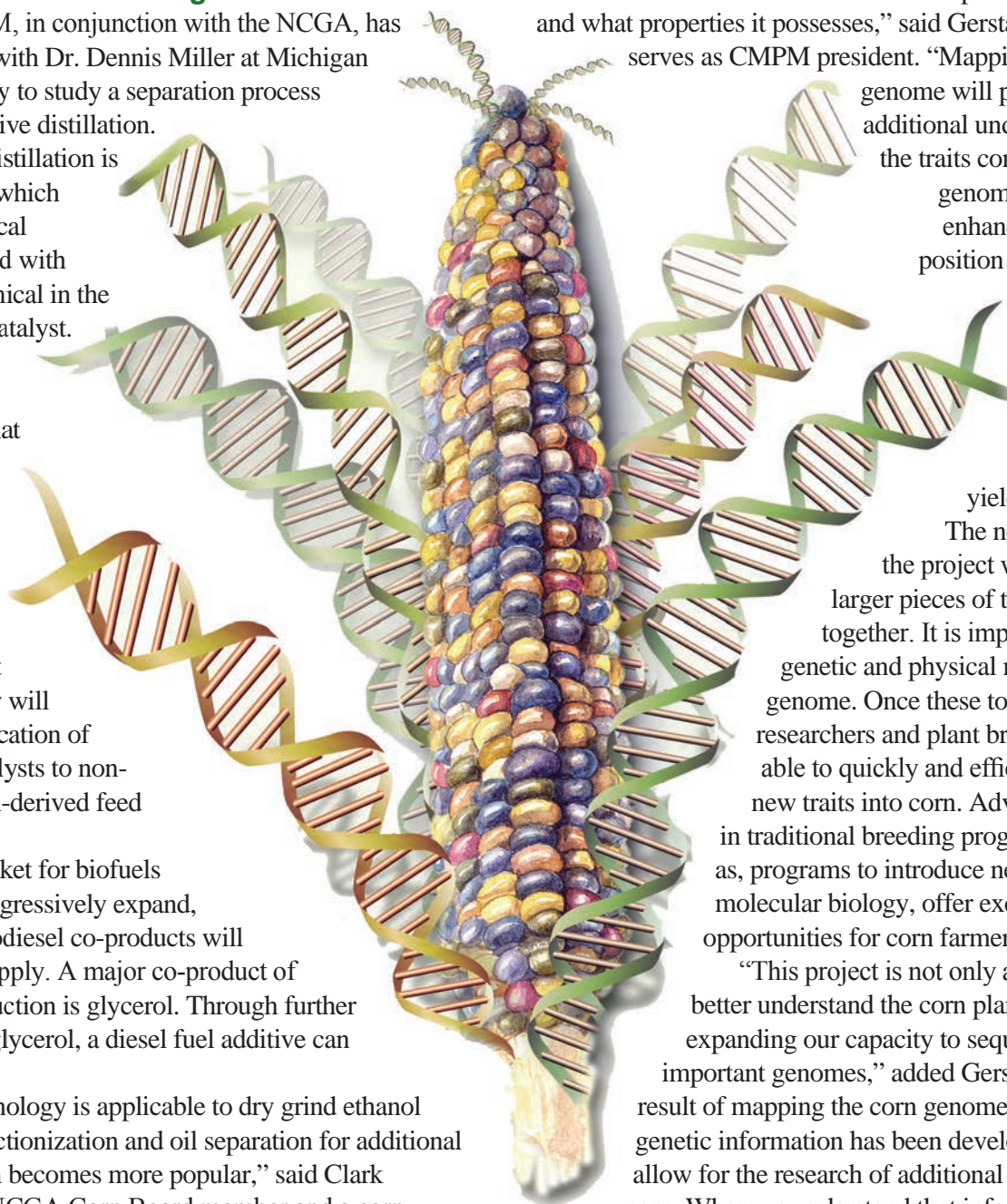
One of the most exciting research projects being conducted through the NCGA with help from the CMPM is mapping of the corn genome. The NCGA is working cooperatively with the National Science Foundation. "Once the corn genome is mapped, it will provide us with the baseline information as to how the corn plant really works and what properties it possesses," said Gerstacker, who also serves as CMPM president. "Mapping the corn

genome will provide additional understanding of the traits contained in the genome and will enhance corn's position as the ideal

crop for food, feed, fuel and industrial uses by unlocking key attributes and additional yield potential."

The next phase of the project will be to place larger pieces of the genetic map together. It is important to develop genetic and physical maps of the genome. Once these tools are in place, researchers and plant breeders will be able to quickly and efficiently introduce new traits into corn. Advancements in traditional breeding programs, as well as, programs to introduce new traits using molecular biology, offer exciting new opportunities for corn farmers.

"This project is not only allowing us to better understand the corn plant, but is also expanding our capacity to sequence other important genomes," added Gerstacker. "As a result of mapping the corn genome, a library of genetic information has been developed that will allow for the research of additional new uses for corn. When we understand that information, the sky is the limit for the uses of corn."



PRODUCTION AND CONSERVATION INVESTMENTS

The Corn Marketing Program of Michigan (CMPM) understands the importance of agronomic research and the role it plays within the agricultural industry. It is through this research that advancements in production and conservation practices are made. The CMPM works on behalf of corn farmers in Michigan to fund research looking at tillage practices, pest control, conservation and fertilizer recommendations.

Corn farmers take a gamble every year when they plant their crops in the spring; but when they try a new production or conservation technique as well, that risk escalates. Through check-off funded research, farmers can benefit from ground-breaking practices which are analyzed in test plots across the state without jeopardizing their bottom line.

Thumb Ag Research & Education

The CMPM has partnered with the agricultural Extension Educators of Huron, Sanilac and Tuscola counties to collaborate with thumb-area growers to conduct extensive corn variety field trials. "In order to ensure the profitable production of corn, on-farm research and demonstration plots need to be conducted to evaluate the value of emerging technologies, varieties, and products," said Clark Gerstacker, a NCGA Corn Board member and a corn farmer from Midland. "By utilizing results from on-farm plots, corn farmers across the state are able to make more informed decisions that will ultimately affect their individual farming operations."

For the 2007 study, two trial sites in each of the three

counties were established for a total of six sites. Each site contained three replications of 104 different varieties. In addition, selected sites also evaluated seed treatments, sulfur fertilization and nitrogen fertilizer rates. On average, each site utilized approximately 20 acres of land.

"Although all sites were planted on a timely basis, heavy rains damaged each site to varying degrees," said Martin Nagelkirk, Sanilac County MSU Extension director and principle investigator. "The grain yield, test weight and moistures were measured at each site, and all data was analyzed for statistical significance. The data from trials that were badly damaged by the adverse spring weather were discarded."

Figure 1 shows the corn variety trial results for the glyphosate resistant 85-92 growing day corn. The full results of the research were published in *Thumb Ag Research & Education, 2007 Field Trials*.

Corn Variety Trial Results				MSU Extension of			Huron, Sanilac, Tuscola Counties				
Glyphosate Resistant 85-92 days RM 2007											
Variety	Maturity (days)	Traits	Insecticide Seed Treatment	5 location ave.			2007 Yields at each location (bu/ac)				
				Ave. Moist	Ave. Test Wt	Yield bu/ac	Gilford	Vassar	Owendale	Deckerville	Kinde
Dynagro DYG53B04	90	RR,CB,RW	P250	18.1	58.0	155.3	96.6	207.0	157.0	153.3	162.8
Rupp XR8072	92	RR,YGPL	CR250	18.3	58.0	154.0	85.6	196.4	164.1	154.2	169.7
Trelay 2R144	90	RR	P250	17.4	59.0	151.0	97.9	193.5	164.6	147.1	151.8
NuTech NT3P191	91	RR,YGPL		18.2	58.0	150.7	89.2	191.1	163.4	146.1	163.6
Dekalb DKC41-57	92	RR,CB,RW	P250	18.2	59.0	148.3	83.3	191.8	150.3	144.2	171.7
Garst 8921YG1/RR	92	YG1,RR	CR250	18.3	59.0	147.2	83.7	185.0	158.1	148.2	161.3
Hyland HLR238	92	RR	P250	18.0	57.0	146.0	77.1	190.2	148.8	159.2	154.7
Dekalb DKC38-33	88	RR,GB	P250	17.8	59.0	142.6	81.3	187.1	159.5	141.7	143.7
Dahlico EB90	88	RR		17.8	60.0	141.0	85.7	172.9	140.7	152.6	153.3
Dahlico 3920	92	RR		17.6	58.0	139.9	87.1	175.0	150.5	138.8	148.3
Vigro 28R56	88	RR	P250	17.7	55.0	131.8	67.0	175.5	135.0	132.3	149.3
Average				17.9	58.2	146.2	85.0	187.8	153.8	147.1	157.3
C.V. %						5.9	8.4	3.5	5.9	7.4	5.5
LSD .05						6.2	12.2	11.2	15.4	18.5	14.7

Bold italicized yields are not significantly different from the highest yield within the same column.



PRODUCTION AND CONSERVATION INVESTMENTS

Center for Excellence Showcases New Tillage and Conservation Practices

The CMPM, once again partnered with the Lenawee Conservation District, the Natural Resources Conservation Service, and the Michigan Soybean Promotion Committee to conduct an extensive research and demonstration project known as the Lenawee County Center for Excellence. Through the Center for Excellence, new practices are tried in test plots for farmers to learn and evaluate data, without it affecting their farming operation's bottom line.

"Corn and soybean farmers from across Michigan have benefited from check-off and privately funded research at the

at both locations and see the plots first-hand before harvest. After harvest, the Center for Excellence Yield Results meeting is held when the results of the research and the yields of all the test plots are reported. This year the meeting was held on February 8, 2008.

The plot at Bakerlads Farm included continuous corn silage and continuous corn grain plots. This year, both sets of the test plots had one of five different practices:

1. Deep Tillage
2. Strip-Tillage
3. No-Till with Gypsum
4. No-Till
5. Disk-Ripper

Bakerlads Continous Corn Silage 2007 Yield Results

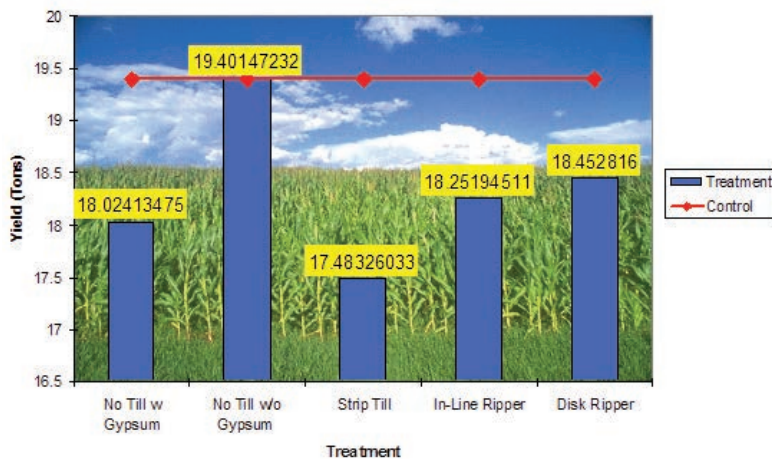


Figure 1. Yield results for continous corn silage.

Lenawee County Center for Excellence for ten years," said Brian Kreps, CMPM vice president and corn farmer from LaSalle. "The Center for Excellence allows corn farmers to see the effects of the new agricultural innovations and techniques without having to assume the risk."

The Center for Excellence, which began in 1998, is a research and testing program consisting of plots on two farms in Lenawee County, Bakerlads Farm and Raymond & Stutzman Farms. The plots test various production practices including conservation tillage, soil fertility levels, sub-irrigation, and testing new seed genetics to determine how farmers can increase productivity, while conserving Michigan's natural resources. The Center for Excellence focuses on researching, developing, and refining viable conservation tillage systems that can be adopted on farms at a local level.

Every August, the Center for Excellence Field Day is held, where farmers learn more about the research being done

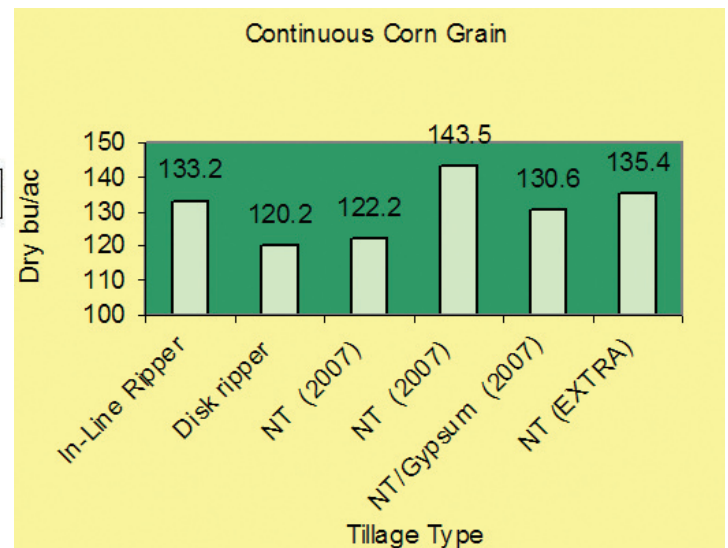


Figure 2. Yield results for continous corn grain.

The 2007 yield results for the continuous corn silage and continuous corn grain are shown in Figure 1 and Figure 2 respectively. In addition to the corn plots, the Center for Excellence incorporated a Livestock Reservoir Wetland Sub-Irrigation System on the Bakerlad Farms. To study the effects of the sub-irrigation system, testing has been conducted looking at the water quality of the system and the yield variability as a result of the sub-irrigation. The yield results on the sub-irrigation plots are shown in Figure 3.

Year	2005	2006	2007
Sub-Irrigated Corn	189.5	188.16	180
Non-Irrigated Corn	171.4	172	145.9
Yield Difference	18.1	16.16	34.1

Figure 3. Yield results on the sub-irrigation plots

Long-Term Management of Dandelions

The CMPM has partnered with researchers in Michigan State University's (MSU) Department of Crop and Soil Sciences to look at the long-term management of dandelions in no-till and rotational tillage cropping systems. "From this research, we expect to provide growers with long-term management strategies for dandelions. Yearly updates will be made to growers on the different systems that reduce dandelion populations in no-till and also rotational tillage systems, no-till soybean and conservation tilled corn," said Jim Kells, MSU Department of Crop and Soil Sciences Chair and principle investigator.

To evaluate the effect of different herbicide treatments on dandelions, corn and soybeans were planted in 20-foot blocks in a field that was managed to have high populations of dandelions. Weed management in the field was minimal the first year to maintain high dandelion populations. After harvest, four permanent quadrants were then established. Dandelions were removed in two of the quadrants to examine seedling establishment, while both seedling and established dandelions in the other quadrants were examined.

Dandelions were managed in one of three ways in these quadrants:

- Fall and spring treatments
- Spring only treatments
- No management

For more information on the specific herbicides used, see Figure 1.

All management techniques reduced dandelion populations by a range of 50 to 96 percent. Yields were also

calculated for the different management techniques. "There was no difference in yield between the different treatments that managed dandelions, but when dandelions were not managed, yield was reduced by 65 percent," added Kells.

Researchers also looked to see how different tillage systems could control dandelions when combined with herbicide treatments. They used a reduced-till system with different herbicide combinations, as well as a no-till system using different herbicides. See Figure 2 to learn more about the tillage systems and herbicides used.

Corn	Soybean
1) Fall fb. Spring fb. in-Crop (RR)	1) Fall fb. Spring fb. in-Crop (RR)
2) Fall fb. Spring fb. in-Crop (RR)	2) PRE with no dandelion act.
3) PRE with no dandelion act.	3) Fall fb. Spring fb. in-Crop (RR)
4) Spring fb. in-Crop (RR)	4) Spring fb. in-Crop (RR)
5) Fall fb. Spring fb. in-Crop (Conv)	5) Fall fb. Spring fb. in-Crop (Conv)
6) Fall fb. Spring fb. in-Crop (Conv)	6) PRE with no dandelion act.
7) PRE with no dandelion act.	7) Fall fb. Spring fb. in-Crop (Conv)
8) PRE with no dandelion act.	8) PRE with no dandelion act.

Fall and spring trts. – Roundup WM (22 oz) + 2,4-D ester (1 pt) + AMS
 All plots are treated with Dual II Magnum (1.33 pt) + Python (1 oz) – EPP
 Conventional corn: Callisto (3 oz) + Atrazine (0.5 pt) - POST
 Conventional soybean: Classic (0.75 oz) - POST

Figure 1. Herbicide treatments

When evaluated, both systems showed a reduced number of dandelions. However, in the fall the reduced-tillage system showed fewer dandelions than the no-till system.

Yields were also compared across the systems. The reduced-tillage system showed no difference across the plot. In the no-till system yield was reduced by 52 bushels per acre in the plots that were only managed for dandelions in the spring.

"I believe that long-term management of dandelions in no-till cropping systems will help keep no-till crop production sustainable. Without effective control strategies, growers may be tempted to use aggressive tillage to reduce dandelions, ultimately losing the benefits realized from no-till," said Kells. Growers using reduced tillage or rotational tillage will also have information on long-term management strategies for this weed. Through the management of dandelion populations, corn farmers can improve their profitability by improving their crop yield.

Tillage (Factor A)	Herbicide Timing (Factor B)
1) No-till	1) No dandelion act. (Gramoxone)
2) No-till (SOY) - Reduced-tillage ¹ (Corn)	2) Fall ² fb Spring (SOY) – Spring only (Corn)
3) Reduced-tillage ¹ (annually)	3) Fall fb Spring

¹ Reduced tillage will include fall chisel plow and spring field cultivation.

² Fall and spring treatments are: Roundup WM (22 oz) + 2,4-D ester (1 pt) + AMS

³ All plots were treated with Dual II Magnum (1.33 pt) + Python (1 oz) – EPP

This study is proposed to be conducted for 4 years, 2 full corn and soybean rotations.

Figure 2. Herbicide and tillage treatments

NEW USE DEVELOPMENT

The CMPM works to stretch check-off investments by not only focusing on production research and enhancing traditional markets, but also by creating new and innovative markets for corn. The CMPM works with a diverse group of partners across the state to look five, ten, and even twenty years into the future to identify new markets and possible uses for Michigan corn. Check-off funded research has led to other new corn use developments including pharmaceuticals, ethanol, and engine oil.

Ethanol Jumps from the Racetrack to the Traintrack

In cooperation with the CMPM and other corn-growing state organizations, AHL-TECH is building the world's first cost-effective ethanol-electric hybrid locomotive. If all goes according to plan, AHL-TECH will take this new technology to market in early 2009.

"AHL-TECH is developing an ethanol-hybrid locomotive to capitalize on the growing ethanol market in the United States, and to replace the railroad industry's aging diesel-electric locomotive fleet," said Tom Mack, president and CEO of AHL-TECH. "If you combine that with increased emissions standards, this alternative to the diesel-electric locomotive starts to look even more promising."

The current diesel-electric locomotives that form the backbone of the railroad fleet range from 1,000 to 5,000 horsepower. The diesel engines are connected to large generators that drive electric motors that are directly attached to the locomotive's axels.

AHL-TECH's ethanol-hybrid locomotive is designed to replace some of the smaller locomotives in the fleet, generally the 1,000 to 2,000 horsepower models. Figure 1 shows an illustration of the AHL-Tech prototype. The ethanol-hybrid has two power sources driving the axels. Much like in diesel-electric locomotives, an ethanol-fueled engine powers a generator connected to the locomotive's axels. Unlike the diesel-electrics, the ethanol-hybrid also has a battery component. Instead of a direct correlation between the speed of the engine and the power transmitted by the generator, AHL-Tech's design features a capacity to store electricity when the generator produces more power than is being used to move the locomotive. This gives the operator the option of powering the axels by running the engine or using power stored in the main battery. It also allows for regenerative braking – capturing the energy lost when a locomotive is brought to a halt.

"There are approximately 12,000 of these diesel-electric locomotives in service in the United States today, providing

a market for a locomotive propulsion system that marries ethanol right out of the railcar, with off-the-shelf batteries and a state-of-the-art proprietary computer and software power management system that makes the AHL-TECH locomotive nearly as efficient as current diesel engine powerplants, but with virtually zero emissions of oxides of nitrogen (NOx) or particulate matter (PM)," added Mack. "By using ethanol, the AHL-TECH system provides far lower net greenhouse gas emissions."

According to the American Short Line and Regional Railroad Association (ASLRRA), the U.S. railroad industry today consumes about nine billion gallons of diesel fuel per year, about 20% of total U.S. demand, which is growing due to massive expansion of freight railroad operations, spurred by huge increases in U.S. biofuels production in the Midwest.

"We are excited about the potential of using ethanol to fuel our nation's locomotives," said Bruce Noel, former CMPM board member and a corn grower from Leslie. "There appears to be a very strong market for an ethanol-powered locomotive. Even the state's ethanol plants would be able to invest in ethanol-powered locomotives for local rail use at their facilities and produce their own fuel on location."

AHL-Tech is hoping to have its prototype ethanol-hybrid locomotive released in the coming year. From there, the demonstrated abilities of the ethanol engines and the state of the market will dictate what happens with the locomotive.

"This project builds upon Michigan's two greatest strengths, its manufacturing experience and the agricultural industry, while highlighting the innovation and entrepreneurial spirit that continue to drive the expansion of our industry," said Don Koivisto, MDA director. "This project has exceptional potential to provide jobs for Michigan's consumers, another market for corn-based products, improvements to our nation's transportation infrastructure, and a boost to our State's economy."



Figure 1. Design of the high horsepower locomotive.



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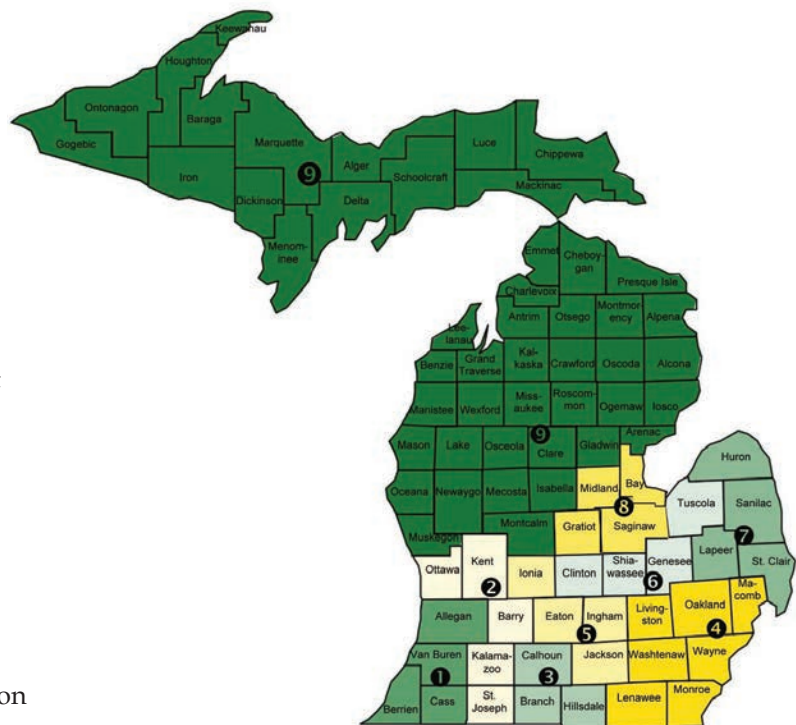
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Headquartered in DeWitt, Michigan, the Corn Marketing Program of Michigan (CMPM) is a legislatively-established statewide program that utilizes one-cent per bushel of corn grown in Michigan and sold. Investments are made in the areas of research, education, market development, and new uses in an effort to enhance the economic position of Michigan's corn farmers.

For more information on the CMPM, call the office toll-free at 1-888-323-6601 or visit us online at www.micorn.org.